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SEAAIR 2022: New Normal Education: Transitioning, Transforming, and Technologies Agenda
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MESSAGE FROM PRESIDENT OF SEAAIR

SEAAIR greets you and warmly welcomes you all with great pleasure to our SEAAIR 22nd Annual Conference in Seoul, South Korea. We thank our distinguished speakers and participants for joining us this year, and to many of our participants and presenters, we say "for joining us again." Indeed, we are very grateful to Sungkyunkwan University (SKKU) with the Korean Association for Adult and Continuing Education (KACE) for accepting the enormous task as this year's Local Organizing Committee (LOC) and in making this scholarly event happen.

For more than two decades, SEAAIR remains steadfastly committed to its purpose. That is, "to benefit, assist and advance research leading to improved understanding, planning, and operations of HEIs in the South East Asia." We firmly believed that SEAAIR has flourished through the years because of its unrelenting focus on its reason for being and for consistently upholding the wisdom and history established by the founding members. It has become a conduit of academic and cultural platforms.

As a maturing organization, SEAAIR has advanced in its desire to become more inclusive …. into SEAAIR Plus through partnerships with other countries like China, Korea, and Taiwan, with key participations from Japan and Australia, and other frequent nationalities' involvements.

This year's theme "New Normal Education: Transitioning, Transforming, and Technologies Agenda" is not only appropriate but very timely when practically HEIs all over the globe continue to grapple with digitization in transitioning from the pandemic era that created for us the aftermath of what we call now as the New Normal.

We received a total of 99 abstracts, with 75 full papers submitted for review and , 73 or 78% of which were accepted. However, to be presented in this year's conference are 44 papers or more than 58%, which are spread quite well in the four sub-themes.

Joining a face-to-face conference after the pandemic proved to be very challenging. But many of us made possible what seemed impossible…we were willing to go through the hurdles, notwithstanding the paper refinement, ….but for most of us, we can't believe we are finally here, after the entry challenges of uncertainties.

The new normal has painted a more convoluted travel landscape that can be very dispiriting, but yes…we were able to put up with the complexities. Is this not one good reason to cheer that our being here is more of a personal victory? Let's claim our personal victory! Cheers!

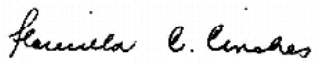
We sincerely commend our LOC headed by Prof. Jang Wan Ko with his dynamic team. The very fast responses to additional participants/presenters' document requests were catalysts to have found many of us here now joining.

We thank our Keynote Speakers for setting the tone of our Conference. Likewise, we are also very grateful to our Plenary Speakers, whose inputs greatly widened our perspective on our conference Theme.

Our LOC took to the task of creating for all of us, not only this academic experience but also enjoyably meaningful and memorable experience through their warm hospitality and the rich traditions and cultures of Seoul. Let's join the tour of what they have prepared for us.

Thus, we look forward for everyone to enjoy the conference as a conduit of both academic and cultural platform in addition to your life's journey, that is not only memorable but a rich experience.

We reiterate our sincere gratitude to SKKU, the LOC members and team for taking up meaningfully the 22nd SEAAIR Annual Conference. We also thank everyone for your interests in joining the Conference. Thank you.



Prof. Ma. Florecilla C. Cinches, PhD
President

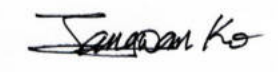
WELCOME MESSAGE FROM ORGANIZER

Welcome to the SEAAIR2022 annual conference in Seoul, Korea. It is our pleasure to meet all the distinguished Professors, Speakers, Presenters and also experts and scholars in this SEAAIR Conference.

The SEAAIR2022 Conference is hosted by Institute of Educational Research at Sungkyunkwan University and Korean Association for Adult and Continuing Education, jointly by South East Asian Association for Institutional Research (SEAAIR). Also we would like to thank Sungkyunkwan University for its generous support.

The SEAAIR conference aims to facilitate international exchange in IR, to transform the wisdom in IR research into action in order to advance the development of teaching and learning in higher education. This year's conference is particularly meaningful in two ways. This is the first on-site conference after outbreak of pandemic. The theme of the conference is "New Normal Education: Transitioning, Transforming, and Technologies Agenda". Hence, the main theme of the conference is indeed a timely one. We are sure that this conference will deeply discuss a way to adapt and succeed in the new normal. In addition, discourse of institutional research in Korea started here at Sungkyunkwan University. The first official IR office in Korea was Center for Institutional Effectiveness established in 2010 at Sungkyunkwan University. Since then higher education communities in Korea have adapted IR functions to support decision-making processes.

We would like to thank the keynote speakers, all presenters, session chairs, and participants for their active involvement, and personally thank the staff and members of local organization committee for their hard work. Wish to meet you again on the next conference. Thank you!



Jang Wan Ko, Ph.D.
Chair, SEAAIR2022 Local Organization Committee
President, Institute of Educational Research, SKKU
President, Korean Association for Adult and Continuing Education

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SEAAIR 2022 22nd Conference Schedule
28-30 September, 2022

DAY1 Wednesday, 28th September, 2022

Time	Activities			
9:00-9:30	Registration			
9:30-9:50	Welcome performance			
9:50-10:00	Break			
10:00-10:30	**Opening Session** *Opening Remarks*: Dr. Ma. Florecilla C. Cinches, President of SEAAIR *Welcome messages:* Dr. Dong Ryeol Shin, President of SKKU Dr. Jang Wan Ko, President of KACE Dr. Byoung-Joo Kim, President of KAIR Exchange of tokens: **20th Anniversary Celebration of SEAAIR**			
10:30-11:00	Group Photo Taking / Coffee Break			
11:00-12:00	**Keynote Speech I** **Creating new & better normal of future higher education in the transforming era: Digitization and data-centric innovation** **Dr. Jong Chul Jung, Chair Professor** Seoul National University of Science & Technology, Former Vice Minister of Education)			
12:00-13:15	Lunch Break			
13:15-13:30	Coffee Break			
13:30-15:00	**Parallel Session I**			
	Session I-1 Room A	**Session I-2** Room B	**Session I-3** Room C	**Session I-4** Room D
15:00-15:15	**Coffee Break**			
15:15-16:45	**Parallel Session II**			
	Session II-1 Room A	**Session II-2** Room B	**Session II-3** Room C	**Session II-4** Room D

DAY2 Thursday, 29th September, 2022

<table>
<tr><th>Time</th><th colspan="3">Activities</th></tr>
<tr><td>9:00-9:30</td><td colspan="3">Registration</td></tr>
<tr><td>9:30-9:45</td><td colspan="3">Coffee Break</td></tr>
<tr><td>9:45-10:45</td><td colspan="3">Panel Session
Institutional Research in New Normal Education
SEAAIR: Dr. Teay Shawyun
Korea: Dr. Giljae Lee
Taiwan: Dr. Sophia Shi-Huei Ho
Moderator: Dr. Seon Joo Kim(Pukyong National University)</td></tr>
<tr><td>10:45-11:00</td><td colspan="3">Coffee Break</td></tr>
<tr><td rowspan="2">11:00-12:30</td><td colspan="3">Parallel Session III</td></tr>
<tr><td>Session III-1
Room A</td><td>Session III-2
Room B</td><td>Session III-3
Room C</td></tr>
<tr><td>12:30-13:30</td><td colspan="3">Lunch Break</td></tr>
<tr><td rowspan="2">13:30-14:45</td><td colspan="3">Parallel Session IV</td></tr>
<tr><td>Session IV-1
Room A</td><td>Session IV-2
Room B</td><td>Session IV-3
Room C</td></tr>
<tr><td>14:45-15:00</td><td colspan="3">Coffee Break</td></tr>
<tr><td>15:00-16:00</td><td colspan="3">Keynote Speech II
The challenge and prospect of Asian university in the digital age

Dr. Seyeoung Chun, Emeritus professor of Education,
(Chungnam National University, Former President of KERIS)</td></tr>
<tr><td>16:00-17:00</td><td>Poster session</td><td colspan="2">General Meeting</td></tr>
<tr><td>17:00-17:30</td><td colspan="3">Old Campus Tour</td></tr>
<tr><td>17:30-18:00</td><td colspan="3">Break</td></tr>
<tr><td>18:00-20:00</td><td colspan="3">Cultural Night & Dinner</td></tr>
</table>

DAY3 Friday, 30th September, 2022

Time	Activities
10:00-15:00	**City Tour**

Oral Presentation Program

DAY1 Wednesday, 28th September, 2022

Parallel Session I 13:30-15:00			
Session I-1 **Room 9B320** **(Dr. Jung-Won Suh)**	**Session I-2** **Room 9B321** **(Dr. Dongho Kim)**	**Session I-3** **Room 9B316** **(Dr. Jiye Hong)**	**Session I-4** **Room 9B318** **(Dr. JeongA Yang)**
Self Efficacy and Supervision Practices among Guidance Directors in Higher Education Institutions (Calvin Dave Ganub)	A sustainable human capital process of Rajamangala University of Technology in Thailand (Krisda Tanchaisak, Rungnapa Lokessathian, Siriphun Thongsai and Duangduen Chancharoen)	The Teaching and Learning Outcomes of Singapore Polytechnic Media, Arts & Design Students From Common Foundation(CFP) Studies (Yanzo Pang and Clarice Sim)	Conversion from physical assessment to online assessment: A Case Study at the Newcastle Australia Institute of Higher Education (Yit Yan Koh and Yaw Long Chua)
New Normal Education: Designing a preferred transformation Jay Somasundaram, Patrick Danaher and Mohammad G Rasul	An examination of the essential competencies among support personnel of an international private university in Bangkok (Krisda Tanchaisak, Pannapat Puvanont and Duangduen Chancharoen)	The Human Capital Empowerment of Lao Krang Ethnic in Suphanburi Province for Cultural Tourism (Chiranuch Sopha, Kanjanarat Rattanasonthi, Rungroj Yenchaipruck, Rugsiri Chunhaphantarak and Proudteema Srirathu)	Problem-Based Online Learning Through Multidisciplinary Studies To Enhance Chemistry Literacy and Improve Environmental Awareness (Familia Novita Simanjuntak and Riska Septia Wahyuningtyas)
Does Institutional Governance Matter in Academics' Job Attitudes? A Comparative Study in Taiwan, Japan, and Korea (Sophia Shi-Huei Ho, Robin Jung-Cheng Chen and Ying-Yan Lu)	An investigation of the human resource management practices at Rajamangala University of Technology in Thailand (Narat Wattanapanit, Rungnapa Lokessathian and Busara Niyomves)	The Assessment of Non-Formal and Informal Educational Standard (Staporn Tavornativat and Pattaraporn Kitchainukoon)	Correlates of Pre-Service Teachers' 21st Century Skills and Mentoring Practices of Supervising Instructors in the New Normal Education (Anally Villanca)
	Essential competencies of support staff in private universities in Thailand: A factor analysis study (Narat Wattanapanit, Pannapat Puvanont and Bongkoch Thongciam)		Analysis of Technological and Pedagogical Knowledge (TPK) on Prospective Biology Teachers to Welcome the Era of Society 5.0 (Riska Septia Wahyuningtyas, Janed Lauren and Familia Novita Simanjuntak)

Parallel Session II 15:15-16:45			
Session II-1 **Room 9B320** **(Dr. Jung-Won Suh)**	**Session II-2** **Room 9B321** **(Dr. Hyunyoung Choi)**	**Session II-3** **Room 9B316** **(Dr. Jiye Hong)**	**Session II-4** **Room 9B318** **(Dr. JeongA Yang)**
Artivism, Art for Social Transformation (Visual Analysis of Student Curated Artworks) (Ma. Cecilia Alimen, Rolando Alimen and Rowena Vargas-Isidro)	Developing the Process of Standardized English Proficiency Test and Mapping onto the Common European Framework of Reference (CEFR) (Kwanhathai Choedchoo, Nutthaporn Owatnupat and Sudsawad Chandum)	The Extent Implementation of the Community Outreach Programs and Activities (Medania Malagsic, Mylene Jainga and Jeffrey Ledesma Jr.)	Guidelines for Development of Graduate Curriculum in Early Childhood Education Management (Bongkoch Thongeiam, Krittrin Tumat and Narat Wattanapanit)
Learning Development for Early Childhood by 5-STEPs learning process following King Rama IX's Philosophy regarding Early Childhood Inclusive Education (Chadtharawadee Boonthanom)	The Result of Cooperative Learning Approach Emphasizing on Team-Pairs-Solo Teaching Method for the English-speaking Skill (Saowapan Palasuwan)	Tertiary Education Readiness Assessment of the Pioneering Senior High School Graduates of the Philippine K-12 Program (Jo Niza Mortiz and Jayson Digamon)	The development of the STIs & HIV and contraception virtual classroom (SHCVC) program on early childhood pre-service teachers (Chitraporn Boonthanom, Thitinun Teravecharoenchai and Junthanee Teravecharoenchai)
Re-Discovering Online Learning Situation and Teaching-Engagement toward Institutional Development of Private Maritime University in the Philippines (Rolando Alimen and Ma. Agnes Regina Torres)	Do I know as much as I think I know?: The effect of the test on Thai EFL undergraduate students' perceived grammatical knowledge (Ekamorn Iamsirirak and Pariwat Imsa-Ard)	A Pathway Toward Happiness for Thai Undergraduate Students during the COVID-19 Outbreak: The Role of Perceived COVID-19 Stressors and Cognitive Flexibility (Manika Wisessathorn, Sawian Kaewwongsa, Kamonrat Thirapong and Ekamorn Iamsirirak)	Weathering the Pandemic: The 'What If' Experience in Scenario Planning (Ma. Florecilla C. Cinches)
	Various Online Learning in Academic Reading Class as the Efforts to Increase Students' Motivation (Masda Surti Simatupang and Ramot Peter)	Measurement Of Psychometric Trait Of Athletic Identity, Mental Health and Perceived Social Support On Career Planning Among Student-Athletes (Kai Yan Wong, Tajularipin Sulaiman and Wan Marzuki Wan Jaafar)	SEAAIR 20/20: A Review of SEAAIR Annual Conferences 2000 – 2020 (Koh Yit Yan and Chua Yaw Long)

DAY2 Thursday, 29th September, 2022

Parallel Session Ⅲ 11:00-12:30		
Session Ⅲ-1 **Room 9B318** **(Dr. Hyunyoung Choi)**	**Session Ⅲ-2** **Room 9B316** **(Dr. Jiye Hong)**	**Session Ⅲ-3** **Room 9B215** **(Dr. Jang Wan Ko)**
Assessment of Professional Learning Teams: The College of Education Experience (Ma. Cecilia Alimen and Ma. Delsa Gange)	Risk Analysis and Mitigation Learning from Home During the COVID-19 Pandemic: An Effort to Transform the Quality of Education (Imeldha Putrianti and Ktut Silvanita Mangani)	A Causal Model of Organizational Culture, Psychological Attributes, School Environment and Performance of Faculty in Higher Education Institutions (Albert Villanca)
Teachers' Psychological Factors And Teachers' Work Motivation During Movement Control Order (MCO) (Abdul Aziz Ismail, Kai Yan Wong and Tajularipin Sulaiman)	Analysis of University's Globalization Discourse Using News Big Data Focusing on Topic Modeling Analysis Methods (Jiwoo Park and Jang Wan Ko)	Children of Ofws and Overseas Parents: An Assessment of the USLS GEC-Chipa Support Group Program (Lota Largavista, Rowena Bañes, Mary Grace Bañares and Joyce Benedicto)
Creating a Research Culture in a Dominican University: Perspectives and Productivity of University of Santo Tomas-Legazpi Faculty (Jet Guerrero, Christine Grace Azul and Jason Carmona)	The Lifelong Learning Management Model for Good Agricultural Practice (GAP) Skills based on the Intelligence Agricultural Demonstration Farm for Farmers and Students at Suan Dusit University, Thailand (Nuttabodee Viriyawattana, Tipawan Wannakan and Surachat Sinworn)	A Study of Adult Learners in Taiwan Community Universities on Grit and Learning Engagement: Psychological Capital and Learning Empowerment as a Mediator (Po-Lin Chen)
Connectedness Matters: Exploring Psychological Distance in Online Education (Angelica Panique and Coolen Joy Nebreja)		A social critical analysis on Philippine higher education in the time of covid-19 pandemic towards a framework on flexible learning (Alvin Sario)

Parallel Session IV 13:30–14:45		
Session IV-1 **Room 9B313** **(Dr. Hyunyoung Choi)**	**Session IV-2** **Room 9B316** **(Dr. Jiye Hong)**	**Session IV-3** **Room 9B321** **(Dr. Tajularipin Sulaiman)**
Political Education Design with the Penta Helix Model in the New Normal Era (Putri Hergianasari and Rizki Amalia Yanuartha)	Digital Inclusion among educators: An examination of salience in Public and Private Schools within Metro Manila (Mateo Borbon, Maria Loida Faye Borbon and Evelyn Lagang)	Ambidextrous Chair: Design Solution For Both Right And Left Handed Persons Mary Grace Sabadisto
Transforming Education: Utilization of New Media as a Means of Political Participation of Beginner Voters in Indonesia (Rizki Amalia Yanuartha and Putri Hergianasari)	A Scientometric Analysis on Chinese Higher Education Informatics (Ting Liu and Jang Wan Ko)	Promoting Tourism Using Digital Technology at Archaeological Sites for Students with Disabilities (Keyoon Wongkorm)
Use of Technology-Enabled Teaching-Learning among Library and Information Science (LIS) Faculty in a Private University (Cozette Gregorios and Ma. Cecilia Alimen)	Conducting Research: Experiences, Challenges, and Benefits towards Institutional Development Activities in the Private Maritime University, Philippines (Rolando A. Alimen and Marie Bella N. Estores)	Digital Technology for Learning Vocabulary for Students with Disabilities (Kanvipa Hongngam and Sucheera Polrachom)
Flexible Learning in CASE UST Legazpi in the time of COVID-19 Pandemic (Alvin Sario, Lalaine Valladolid, Patrick Joseph Seeillano)		

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Theme I: Transforming Education & IR Governance & Management

Self Efficacy and Supervision Practices among Guidance Directors in Higher Education Institutions

Calvin Dave D. Ganub

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ABSTRACT

Counselor supervision is an integral component in the growth and development of counselors. While counseling and supervision share some similarities, they are distinct competencies that develop separately and therefore must be measured separately. This study investigated the self-efficacy and supervision practices among guidance Directors of higher education institutions. The convergent parallel mixed method design was employed by applying survey and in-depth, interviews delving into the experiences of the participants. The study included guidance directors of higher educational institutions in the Philippines for the academic year 2021-2022, with a total number of 55 for the survey. The participants for the in-depth interview consisted of 10 Guidance Directors. The result of the study identified the emergence of the six (9) themes such as 1. Rising to the ladder of success: Reminiscing humble beginnings.2. Shortage of Guidance Counselors: Poses a challenge to the delivery of Guidance Services, 3. Supportive School Administration: Keystone towards dynamic Guidance Center, 4. Sharpening the Edge: Embracing Life Long Learning Values, 5. The 3 Cs of Supervision: Collaboration, Consultation, and Communication, and 6. Going Beyond Monetary Rewards: Staying Committed Amidst Attractive Offer from Other Universities. They are aware of the role that they play in ensuring that the guidance counselors have the skills, training, and support that they need to be able to effectively deliver the guidance services to the students. The level of self-efficacy among Guidance Directors in Higher Educational institutions as a whole is Exactly True (M=3.57) signifying agreement that they have strong beliefs in their capacity to administer and implement the guidance services as well as in dealing with people under their department. Results show no significant difference in the level of supervision practices among guidance directors when grouped according to profile. Regardless of age, sexual orientation, length of service, academic rank, and highest educational attainment, they signified agreement that they are indeed doing all their supervisory functions. Thus, the succession planning and mentoring process may be evident to train potential leaders in the organization so that the school could not spend so many resources re-training its people again and to be ready for job transitions and turnover of their employees.

Keywords: Self-Efficacy, Supervision Practices, Guidance Directors, Higher Education Institutions

Introduction

Background of the Study

Counselor supervision is an integral component in the growth and development of counselors. While counseling and supervision share some similarities, they are distinct competencies that develop separately and therefore must be measured separately. Mental health providers address mental health issues and increase the quality of life at different levels starting from individual to global levels for individuals and communities. Mental health providers are key people who strive to alleviate suffering and enhance the well-being of people. More professional supervision is needed to focus on the training of mental health providers, which means their clinical supervision. The profession of counseling has made considerable growth in the area of licensure and certification over the past three decades (Gladding, 2020). Yet, procuring a license or certification can be a difficult, costly and confusing task for beginning counselors. At this writing, all states but five in the United States have licensure laws and regulations for practicing professional counselors (American Counseling Association, 2020). The Philippines recognizes the important roles of guidance counselors in nation-building and promoting the sustained development of a reservoir of such whose competence has been determined by honest and credible licensure examinations at par with standards of professional practice and service that are not only world-class but also internationally recognized, globally competitive through preventive regulatory measures, programs, and activities that foster their continuing professional development (Republic Act 9258). In addition, supervision is defined as a formal process. Supervision is a relationship between a supervisor and a supervisee who is contractual. When supervision occurs outside of the university, designated members of the profession provide supervision. Supervisors are individuals who are appropriately degreed, credentialed, experienced, and licensed. Supervisors provide leadership, mentorship, and directional support to individuals who desire entry into the profession of counseling. Moreover, supervision has been defined as "A working alliance between the supervisor and the counselor in which the counselor can offer an account or recording of their work; reflect on it; receive feedback, and where appropriate guidance." (Inskipp and Proctor cited in Wheeler & Richards, 2020). Also, in the social cognitive model for training counselors (SCMCT), counseling self-efficacy is a key factor in effective counseling actions (Larson, 1998). Many studies have shown that counseling self-efficacy predicts counselor performance. According to Larson (1998), individuals have actions that are filtered through self-assessments. The four sources of self-efficacy are (a) mastery, (b) modeling, (c) social persuasion, and (d) affective arousal. Mastery includes modeling and understanding the client's success including participation modeling (witness the success of counseling sessions on the videotape). Social persuasion refers to supervisory support, encouragement, and structuring of learning situations that will enable counselors to successfully help clients. Also, Lent et al (2006) state that counseling self-efficacy refers to the counselors' beliefs in their ability to perform duties related to counseling. Hence, it is envisioned that there is a need to look into the self-efficacy of the guidance directors as it somehow affects their supervision practices.

Hypothesis 1. There is no significant difference between self-efficacy and supervision practices among guidance directors.

Theoretical Framework

This study is anchored on the expectancy theory proposed by Victor Vroom of Yale School of Management in 1964. Vroom stresses and focuses on outcomes, and not on needs, unlike Maslow and

Herzberg. The theory states that the intensity of a tendency to perform in a particular manner is dependent on the intensity of an expectation that the performance will be followed by a definite outcome and on the appeal of the outcome to the individual. The expectancy theory states that an employee's motivation is an outcome of how much an individual wants a reward (valence), the assessment that the likelihood that the effort will lead to expected performance (expectancy), and the belief that the performance will lead to reward (Instrumentality). In short, valence is the significance associated by an individual with the expected outcome. It is an expected and not the actual satisfaction that an employee expects to receive after achieving the goals. Expectancy is the faith that better efforts will result in better performance. Expectancy is influenced by factors such as possession of appropriate skills for performing the job, availability of the right resources, availability of crucial information, and getting the required support for completing the job. Instrumentality is the faith that if you perform well, then a valid outcome will be there. Instrumentality is affected by factors such as belief in the people who decide who receives what outcome, the simplicity of the process of deciding who gets what outcome, and clarity of the relationship between performance and outcomes. Thus, the expectancy theory concentrates on the following three relationships: Effort-performance relationship: What is the likelihood that the individual's effort is recognized in his performance appraisal?

Conceptual Framework

This study is anchored on the Integrative Models of Supervision. As the name implies, integrative models of supervision rely on more than one theory and technique (Haynes, Corey, & Moulton, 2003). Given a large number of theories and methods that exist concerning supervision, an infinite number of "integrations" are possible. Because most counselors today practice what they describe as integrative counseling, integrative models of supervision are also widely practiced (Haynes, Corey, & Moulton). Haynes, Corey, and Moulton describe two approaches to integration: technical eclecticism and theoretical integration. Technical eclecticism tends to focus on differences, chooses from many approaches, and is a collection of techniques. This path calls for using techniques from different schools without necessarily subscribing to the theoretical positions that spawned them. In contrast, theoretical integration refers to a conceptual or theoretical creation beyond a mere blending of techniques. This path has the goal of producing a conceptual framework that synthesizes the best of two or more theoretical approaches to produce an outcome richer than that of a single theory (Haynes, Corey, & Moulton, p. 124).

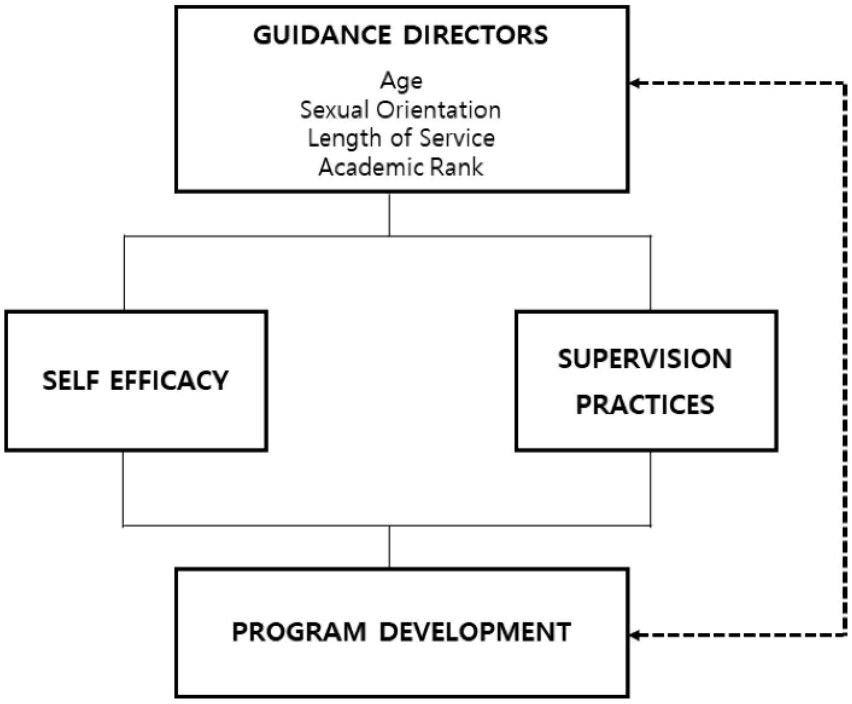

Figure 1: Schematic Diagram of the Conceptual Framework

Methods

The study employed an explanatory sequential mixed method approach in data generation and analysis. This consisted of a survey and phenomenological in-depth interviews. The survey is a pre-defined series of questions used to collect information from individuals regarding the topic being investigated while using a phenomenological approach was utilized using the life story approach. (Creswell, 2017). The participants of the study were guidance directors and should meet the following criteria; age ranges are from 25-60 years old, are full-time employees, and either have master's or Ph.D./Ed.D. degrees registered guidance counselors, appointed as guidance directors for at least a year, and have been employed in the university for at least 1 year or more. Excluded in the study are registered guidance counselors on part-time status. For the survey part, there were a total of 35 Guidance Directors who serve as participants. The list was retrieved from the CHED HEIs in the province. The study made use of purposive sampling; identified ten (10) participants across Negros Occidental for in-depth interview (3 from South Negros, 4 from Central Negros, and 3 from North Negros) while the remaining participants who did not meet the given inclusion criteria set forth by the researchers were identified through the assistance of the Philippine Guidance and Counseling Association Inc. was selected through total enumeration for the survey part. To cull out the self-efficacy and supervision practices of guidance directors among private higher education learning institution units, a three-part questionnaire was used covering the faculty vis a vis their common experiences, issues, and concerns while being a counselor supervisor in a university. The questionnaire generated the following information: Block I, the biographical data namely; participant's name (optional), age, sexual orientation, length of service, and academic rank. Block II included the participants' self-efficacy and supervision practices. The survey questions were subjected to face and content validation and were scrutinized by a panel of experts who are known in the field of Psychology, Guidance, Counseling, and Research. Using the Good and

Scates Evaluation form, the survey questions got a 4.15 score which is interpreted as very high. These researcher-practitioners critiqued the questions to ensure that they measured the objectives of the study. The survey questions were pre-tested to 15 guidance directors who are employed in a university or at a college outside of Negros Occidental and met the criteria to generate the Cronbach Alpha coefficient score for the reliability of .91 which is considered very high. Moreover, to ensure that it measures what it purports to measure vis a vis the research objective of the study, the in-depth interview guide questions also underwent a face and content validation by the pool of experts in the discipline of Psychology and Guidance and Counseling.

Results and Discussions

The following themes were culled out from the interview transcript.

Theme 1: Rising to the ladder of success: Reminiscing humble beginnings.

One of the themes that emerged in the interview transcript is Rising to the ladder of success: Reminiscing humble beginnings. Although one can be a good counselor, they do not necessarily possess all the skills needed to be a good supervisor. It takes a lot of experience and some training for them to be more adept in the changing landscapes of the counseling profession. The new role requires a new body of knowledge and different skills, along with the ability to use their clinical skills differently. Most of them started as full-time guidance counselors and eventually when the school administration noticed their performance, they were appointed as Guidance heads to manage both the people and the operations of the office.

Theme 2: Shortage of Guidance Counselors: Poses a challenge to the delivery of Guidance Services

The second theme that emerged is the shortage of guidance counselors which poses a challenge to the delivery of Guidance Services. The acceptable ratio of counselor to student population is at least 1:1,000. 14.2. 2 A counseling room shall be provided to ensure the privacy and confidentiality of counseling sessions. The records and/or counseling notes are maintained and kept confidential and should be used in aid of counseling and intervention. The major aim of Guidance Counseling Services is to encourage students' academic, social, emotional, and personal development or in other words the holistic development of individuals by maximizing their potential. To reach this aim, the guidance counseling services help students get to know themselves better and find effective solutions to their daily problems and or areas of concern.

Theme 3: Supportive School Administration: Keystone towards dynamic Guidance Center

Another theme that has been culled in the interview transcript is Supportive School Administration: Keystone towards dynamic Guidance Center. The success of the guidance services center lies also in the kind of support given by the school officials. The school administrators, with their positions, are responsible for the Guidance and Counseling Services in the school community. They are in essence the chief counselors because the nature of their appointment requires that they assume the responsibility of providing Guidance and Counseling to the whole school in ensuring the school operations follow the expected outputs and attributes not only by the faculty and staff but also by other major stakeholders in the academe.

Theme 4: Sharpening the Edge: Embracing Life-Long Learning Values

Another theme has come up in the course of the analysis, Sharpening the Edge: Embracing Life Long Learning Values. As schools are reopening their doors to this ongoing pandemic, students are arriving

in schools bringing along with them some experiences of significant learning loss, various forms of trauma, and overall disengagement, and some even had developed numerous mental health conditions that affect their learning states. As licensed professionals trained in promoting students' social-emotional, academic, and postsecondary development, school counselors are key to supporting students' re-adjustment and learning. School counselors must continue to learn relevant interventions to ensure that they will address the mental health issues and concerns of the students by attending to or continuing with their professional education.

Theme 5: The 3 Cs of Supervision: Collaboration, Consultation, and Communication

Another theme that emerged is the 3 Cs of Supervision: Collaboration, Consultation, and Communication. Counselor supervision has received much attention in recent years, with various models informing its practice. One recent trend has been the acknowledgment of the importance of a strong, collaborative relationship in generating positive supervision outcomes (Trepal, Bailie, & Leeth, 2010). Communication plays a pivotal role in workplace productivity and relationship. Happy workers tend to be efficient and effective since they manifest a positive attitude towards work and have meaningful engagement with their colleagues.

Theme 6: Going Beyond Monetary Rewards: Staying Committed Amidst Attractive Offer from Other Universities

The last theme that was culled out in the interview transcript is Going Beyond Monetary Rewards: Staying Committed Amidst Attractive Offers from Other Universities. With the stability offered by state universities in terms of salary and benefits, counselors from the private universities are greatly attracted because even though there is a pandemic the state-run school is well supported financially by the national government. These realities have led some counselors to look for a brighter tenure where they can also support not only their personal needs but also their family's needs as well.

While for the quantitative result on the level of supervision practices is an important aspect of the training and mentoring of school counselors. The table shows that the overall mean score for the level of supervision practices is 3.48 signifying agreement that guidance directors are doing all the supervisory functions. They are aware of the role that they play in ensuring that the guidance counselors have the skills, training, and support that they need to be able to effectively deliver the guidance services to the students. This affirms the finding that supervision provides school counselors with specific feedback to assist with the enhancement of their professionalism, for example in their levels of competence and commitment (Somody, Henderson, Cook, & Zambrano as cited in Walsh-Rock, 2018).

On top of the list is supervising and evaluating staff performance" which got the highest mean score of 3.78. They oversee the proper administration of the guidance program (M = 3.75), allow supervisees to create and design their activities with minimal supervision (M = 3.71), ensure that counselors continue to increase their skills, which in turn increases treatment effectiveness, client retention, and staff satisfaction (M = 3.69), take responsibility for the inventory of holdings (M = 3.65), evaluate program impact and recommend improvement (M = 3.60), conduct critiquing undertakings after the activity was implemented (M = 3.58), help the supervisees' critical attitude to make suggestions on how to improve the office (M = 3.56), observe the supervisee in carrying out their counseling and clinical practices and provide feedback mechanisms on scientific, technical, and attitudinal competencies (M = 3.53), protect the clients by involving an impartial third party in the work of a counselor and client, helping to reduce the risk of serious oversight (M = 3.49), conduct planning workshops (M = 3.47), assist supervisees in the financial and budgetary preparations of their programs and activities (M = 3.44), encouraged them to conduct researches and publication works (M = 3.40), assist the supervisee to reflect on the actions of their counseling interventions (M = 3.38), meet regularly with the supervisees to

review the supervisee's work and help them become prepared to serve a range of diverse clients (M = 3.35), conduct individual supervision sessions with a supervisee periodically and discuss the counseling situations of the client with the supervisees (M = 3.29), conduct case documentation analysis and proper reporting with my supervisees (M = 3.22) and evaluate their teaching competencies through their assigned subjects (M = 2.85).

In supervision, guidance directors need to establish a good relationship with guidance counselors to facilitate the smooth flow of the guided activities. The understanding and support that they could provide can go a long way in terms of enhancing the counselors' skills. The critiquing and feedbacking can help the latter become prepared to serve a range of diverse clients. Through their leadership, counselors may feel empowered as they inspire team spirit and commitment to one's job. This is consistent with the finding that the perceived quality of the relationship has been linked with improved supervision outcomes, higher satisfaction with supervision, increased self-disclosure in supervision, and increased use of clinically appropriate counseling behaviors (Ellis, 2001; Falender, 2010; Mehr, Ladany, & Caskie, 2010; Nelson & Friedlander, 2001; Protivnak & Davis, 2008).

The item "evaluate their teaching competencies through their assigned subjects" has the lowest mean score (M=2.85). This indicates that this aspect was considered the least among the supervisory functions. Their teaching job is an opportunity to educate and inform the students about important topics. Hence, problems regarding teaching the subjects assigned may need to be explored and addressed. As Walsh-Rock (2018) noted the importance of understanding how clinical supervision impacts the work of school counselors to engage in academic planning, create career exploration experiences, and also support students with mental health needs and personal issues may provide a deeper understanding of the importance of affording school.

Being well versed in the curriculum allows guidance directors to give meaningful feedback to counselors as they create a new curriculum for their classes and as they assess and improve their pedagogy. Maintaining a good relationship with the counselors is a key factor in supervision. Supervision is defined as a working alliance between the supervisor and the counselor in which the counselor can offer an account or recording of their work; reflect on it; receive feedback, and where appropriate guidance" (Inskipp and Proctor as cited in Wheeler & Richards, 2020). Table 1 shows the Level of Supervision Practices among Guidance Directors in Higher Educational institutions as a whole.

Table 1: The Level of Supervision Practices among Guidance Directors in Higher Educational Institutions as a whole

Item	Mean	Interpretation
1. As a supervisor, I observe the supervisee in carrying out their counseling and clinical practices.	3.53	Exactly True
2. As a supervisor, I provide feedback mechanisms on scientific, technical, and attitudinal competencies.	3.53	Exactly True
3. As a supervisor, I meet regularly with the supervisee to review the supervisee's work and help them become prepared to serve a range of diverse clients.	3.35	Exactly True
4. As a supervisor, I ensure that counselors continue to increase their skills, which in turn increases treatment effectiveness, client retention, and staff satisfaction.	3.69	Exactly True

Item	Mean	Interpretation
5. As a supervisor, I protect the clients by involving an impartial third party in the work of a counselor and client, helping to reduce the risk of serious oversight.	3.49	Exactly True
6. As a supervisor, I conduct individual supervision sessions with a supervisee periodically.	3.29	Exactly True
7. As a supervisor, I conduct case documentation analysis and proper reporting with my supervisee.	3.22	Moderately True
8. As a supervisor, I help the supervisees' critical attitude to make suggestions on how to improve the office.	3.56	Exactly True
9. As a supervisor, I assist the supervisee to reflect on the actions of their counseling interventions.	3.38	Exactly True
10. As a supervisor, I discuss the counseling situations of the client with the supervisee.	3.29	Exactly True
11. As a supervisor, I encouraged them to conduct research and publication works.	3.40	Exactly True
12. As a supervisor, I evaluate their teaching competencies through their assigned subjects.	2.85	Moderately True
13. As a supervisor, I assist them in the financial and budgetary preparations of their programs and activities.	3.44	Exactly True
14. As a supervisor, I allow them to create and design their activities with minimal supervision.	3.71	Exactly True
15. As a supervisor, I conduct critiquing undertakings after the activity was implemented.	3.58	Exactly True
16. As a supervisor, I conduct planning workshops.	3.47	Exactly True
17. As a supervisor, I evaluate program impact and recommend improvement.	3.60	Exactly True
18. As a supervisor, I oversee the proper administration of the guidance program.	3.75	Exactly True
19. As a supervisor, I take responsibility for the inventory of holdings.	3.65	Exactly True
20. As a supervisor, I supervise and evaluate staff performance.	3.78	Exactly True
Overall Mean	3.48	**Exactly True**

Results show that there is no significant difference in the Level of Self Efficacy among Guidance Directors in Higher Educational institutions when they are grouped according to profile. Regardless of age, sexual orientation, length of service, academic rank, and highest educational attainment, their belief in their capacities are high. They have strong positive beliefs in their capacities and skills to achieve their goals. They can manage difficult problems that arise and remain calm when confronted with difficult situations. They are resourceful and feel confident that they can handle unforeseen situations and deal with unexpected events. They are also mature in dealing with confrontations, conflicts, or arguments. They engage in mentoring and continuously conduct follow-ups with counselors regarding issues and concerns to promote open communication. This coincides with the finding that supervisors should have a strong grasp of what it is that supervisees do when they are practicing the art of counseling (Bernard & Goodyear, 2020). Table 2 shows the significant differences in the level of self-efficacy among guidance directors in Higher Educational institutions when grouped according to variables.

Table 2: Significant Differences in the Level of Self-Efficacy among Guidance Directors in Higher Education Institutions

Variable	Category	Test Statistic	Value	p-value	Decision
Age	20-30 years old 31-40 years old 41-50 years old 51-60 years old 61-70 years old	Kruskal Wallis H Test	7.797	.099	Accept Ho
Sexual Orientation	Male Female	Mann Whitney U Test	103.500	.525	Accept Ho
Length of Service as Employee	0-10 years 11-20 years 21-30 years 31-40 years	Kruskal Wallis H Test	1.545	.672	Accept Ho
Academic Rank	Assistant Professor Associate Professor Full Professor Others	Kruskal Wallis H Test	2.022	.568	Accept Ho
Highest Educational Attainment	College Degree Holder Masters Degree Holder Doctoral Degree Holder	Kruskal Wallis H Test	.617	.735	Accept Ho

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Conclusion and Recommendations

This section presents the conclusion and recommendations of the study.

The majority of the participants, 32.7% were 41-50 years old while the sexual orientation was comprised of females which had 90.9%, length of service is between 0-10 years which has a 34.5%, for the academic rank, they belong to nonteaching personnel which has 52.7% and finally, with regards to their highest educational attainment half of the participants or 56.4%. were master's degree holders.

The overall mean score for the level of supervision practices is 3.48 signifying agreement that guidance directors are doing all the supervisory functions. They are aware of the role that they play in ensuring that the guidance counselors have the skills, training, and support that they need to be able to effectively deliver the guidance services to the students. The guidance directors' level of supervision practices is Exactly True when grouped according to age, sexual orientation, length of service as an employee, academic rank, and highest educational attainment.

The level of self-efficacy among Guidance Directors in Higher Educational institutions as a whole is Exactly True (M=3.57) signifying agreement that they have strong beliefs in their capacity to administer and implement the guidance services as well as in dealing with people under their department. Results show that there is no significant difference in the level of supervision practices among guidance

directors when grouped according to profile. Regardless of age, sexual orientation, length of service, academic rank, and highest educational attainment, they signified agreement that they are indeed doing all their supervisory functions.

The support of the school administration greatly affects the operations and success of the guidance services center. The guidance directors managing the office would possess the necessary experience, competence, and the ability to lead the counselors in gearing towards a goal of effective delivery of the guidance and counseling services. Moreover, the guidance head is expected to harness one's skills and edge through participation in various continuing education activities that would promote the enhancement of the capacities of the head.

The school administration may consider the following to improve the services of the guidance office through hiring additionally registered guidance counselors to fill up positions lacking guidance personnel. Revisit the salary scheme of the guidance counselor's vis a vis reality of the migration of the RGCs to the state universities. Then, the succession planning and mentoring process may be evident to train potential leaders in the organization so that the school could not spend so much re-training its people again and to be ready for job transitions and turnover of their employees.

They are expected to support the guidance services and programs of the center focusing on the mental health and well-being of the students alike and its faculty and staff as well in these trying times. Provision of wellness activities among counselors that would promote camaraderie, cohesion, and a sense of family and belongingness atmosphere in the organization. Hiring policies will be reviewed grounded on the demands of the time to ensure standards with regards to accreditation and certification purposes with a proper counselor–student ratio as mandated by CHED.

Guidance directors should be given the opportunity to harness their supervisory skills by giving them the chance to develop and grow in the profession. Continuous professional training and education could enhance their self-efficacy in handling their offices.

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Applying recent discoveries to design a transformational new normal

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ABSTRACT

Just as an explosion of discoveries in the physical sciences enabled the industrial revolutions, we are now in the midst of an explosion of discoveries in the human sciences and, of particular importance to this audience, in the science of learning. We now have a substantially better understanding of the biological basis of how learning takes place. These discoveries call for a substantial structural re-design of the education system. The purpose of this research is to develop a quantified software model for exploring the impact of educational investments that exploit these discoveries. The model promotes the exploration of structural alterations to the education system. We develop a systems dynamics model of public investment in education on the simulation software platform Vensim®. (Systems dynamics is a methodology for studying the non-linear behaviour of complex systems). The model explores the impact of educational investment decisions on well-being. The structure, formulas and data that we have used are based on the Australian education system. The current model has three user-adjustable variables. More importantly, the Vensim® platform is easy to learn, and thus the model that we have created is easy to adapt and modify by other researchers. The education sector's response to COVID-19 has mainly been reactive – we have simply reacted to lockdowns and other external impacts caused by the pandemic (by contrast, the health sector used modern science to create novel vaccines and infectivity models rapidly). Advances in the science of learning give us the opportunity to transform education and to design and build our preferred futures. Universities are well placed to enable a transformational new normal society.

Keywords: Science of learning, Self-regulated learning, Systems dynamics.

Give a person a fish and you feed them for a day;
teach them to fish and you feed them for a lifetime.[1]

1. Background

1.1. Scientific revolutions

Thomas Kuhn (1962, 1970), in his influential examination of the history of science, found that long periods of slow, incremental development were interspersed with periods of rapid, explosive growth. He coined the term "paradigm shift" to explain the latter periods – when a fundamental conceptual change in the science opens the door to a plethora of discoveries. One such paradigm shift was the discovery by Nicolaus Copernicus (1543, 2008) that the earth was not the centre of the universe (as was believed by Western civilisation). Copernicus's proposal and his willingness to challenge established orthodoxy spurred further discoveries by other scientists. It was these discoveries that were translated by engineers and other applied scientists into inventions that gave us the unprecedented prosperity of the industrial revolutions.

While Copernicus's paradigm shift led to break-throughs in the physical sciences, Kuhn also identified a later paradigm shift by Charles Darwin (Darwin, 1885): the discovery of evolution. This paradigm shift freed scientists in the human sciences (the sciences studying humans and the cultures and institutions that humans construct) to study humans and their behaviours more objectively. This paper is founded on a number of discoveries about human learning that have the potential to revolutionise education.

The discoveries were founded on our understanding of the biological basis of what we call "learning". Disciplines such as neuroscience, biochemistry and endocrinology provide insights into the underlying mechanisms, while disciplines such as evolutionary biology, primatology, cognitive psychology, anthropology and sociology provide insights into observed behaviour, delivering robust and integrated insights into what we call "human learning". The science of learning is multidisciplinary.

This paper briefly describes five discoveries in the science of learning that significantly shifted our current understandings of learning (in Section 3.1),and provides citations for readers to explore these discoveries further. Based on these discoveries, we propose a strategy (in Section 3.2) that has the potential to substantially reduce the cost of education and to bring higher education to the reach of nearly all citizens. We have built (and we describe in Section 4) a software model that permits researchers to explore the effect of different levels of funding on these two strategies. Furthermore, a country's education system is complex and adaptive. While the beneficial outcomes of investment in national education are well theorised, empirical data on the optimal levels of educational investments are sparse and often controversial. Therefore, we built the model on a software platform that is freely available and easy to learn and modify. We encourage readers with similar research interests to adapt and extend the model to align with their own research and interpretations.

1.2. Research Objectives and Contribution

The theme of this conference is "*New Normal Education: Transitioning, Transforming, and Technologies Agenda*". In this paper, we describe the potential for a new normal education based on recent discoveries in learning science: an education system that delivers substantially superior outcomes at significantly lower costs. This potential is what Clayton Christensen characterised as disruptive

[1] A popular adage, but with an unknown origin. It has been variously ascribed to multiple cultures (O'Toole 2015).

innovation (Christensen, 1997, 2013; Christensen, Horn, & Johnson, 2008; Somasundaram & Rasul, 2019). Disruptive innovation is often resisted by large, mature firms, and requires innovative entrepreneurs to disrupt the market. Education is a mature and government-controlled industry producing intangible products whose value is difficult to measure. Disruptive innovation in national education is especially difficult to achieve.

The objective of this research is to develop a model of a national education system that quantitatively explores a strategy for delivering a new normal education.

This research contributes to this conference and to the wider literature through modelling the potential for new discoveries in the science of learning to transform national education. The discoveries themselves are not novel – they have been described by ourselves and other scholars. They are utilised by a few educators and institutions. Nevertheless, the discoveries are not widely utilised and appreciated by educational practitioners, and it is valuable to reinforce them. And we take this opportunity to include more recent research that we have not examined and cited in our previous research.

2. Theoretical framework and methodology

Michael Crotty (1998) emphasised the importance of researchers in the social (human) sciences clearly specifying their theoretical frameworks. This importance can be traced back to the fact that, while the theory of the physical sciences is usually grounded in the belief that they are seeking an objective truth, the human sciences acknowledge and explore issues that are subjective – situated in people's cultures and values. The researcher's own culture and values affect the research. Therefore, making the researcher's theoretical framework explicit allows the readers to understand and interpret the work more effectively.

This paper adapts Crotty's (ibid) four level hierarchy to specify the theoretical framework: (1) an epistemology; (2) a theoretical perspective; (3) a methodology; and (4) methods. Table 1 summarises the theoretical framework used for this research, and each of the four levels is described in the sections below.

Table 1: The Theoretical Framework of this Research

Epistemology	Nature, nurture, and metacognition
Theoretical Perspective	Education as an applied human science
Methodology	Futures studies
Methods	Systems dynamics; environmental scanning; agile recursion

2.1. Nature, nurture, and metacognition

Epistemology means a theory of knowledge – our view of how humans know things and construct knowledge. Our view is that every person's knowledge is influenced by three factors. Firstly, how we perceive the world is heavily influenced by our natural and biological structure. For example, humans have stronger eyesight and a weaker sense of smell than dogs. How we perceive and make sense of the world is very different to how dogs see the world. Secondly, we are heavily influenced by the culture and environment in which we grow and live. Thirdly, humans have a capacity for metacognition - the

capacity to examine their own thoughts and behaviours, and to choose and construct their own individual belief systems. The previous nature versus nurture conflict is outdated: it is nature *and* nurture *and* metacognition.

2.2. Education as an applied human science

By describing our theoretical perspective as being that education is an applied human science, there are three characteristics that we wish to emphasise. Firstly, education is a science. It is a discipline with a substantial body of theory – and an understanding of underlying (biological) mechanisms and how they give rise to observable behaviour. Secondly, there is a distinction between a pure science and an applied science. Applying science requires a different, practical mind-set. Decisions need to be made with partial, often ambiguous information. Costs must be considered. Furthermore, many stakeholders are affected by an application, some positively and some negatively. The application of science must have ethical regard to consequences. And thirdly, education as a human science must be cognisant of the multiple underlying disciplines that make up the human sciences.

As such, our theoretical perspective is that education is the application of scientific, economic, social and practical knowledge in order to invent, design, build, maintain, research and improve structures, systems and processes for education (Adapted from Xu & Shi, 2015).

2.3. Methodology: Futures studies

Futures studies is a multi-disciplinary field whose goal is the identification and design of preferred futures. Substantial effort has been made to develop a robust toolbox of methods (Bell, 1997, 2003; Inayatullah, 2008; Jerome & Gordon, 2009) for this field. The methods that we use come from this toolbox.

Identifying and designing a future are extremely complex tasks. The nature of complex problems is best understood by comparing it to the complicated problems frequently found in the physical sciences:

> Complicated problems originate from causes that can be individually distinguished; they can be addressed piece-by-piece; for each input to the system there is a proportionate output; the relevant systems can be controlled and the problems they present admit permanent solutions. On the other hand, complex problems and systems result from networks of multiple interacting causes that cannot be individually distinguished; must be addressed as entire systems, that is[,] they cannot be addressed in a piecemeal way; they are such that small inputs may result in disproportionate effects; the problems they present cannot be solved once and for ever, but require to be systematically managed and typically any intervention merges into new problems as a result of the interventions dealing with them; and the relevant systems cannot be controlled. (Poli, 2013, p. 142;)

2.1. Methods (1): Systems dynamics

As John Sterrman put it in an influential paper on systems dynamics:

> Today's problems often arise as unintended consequences of yesterday's solutions. Social systems often suffer from policy resistance, the tendency for well-intentioned interventions to be defeated by the response of the system to the intervention itself. The field of system dynamics, created at MIT in the 1950s by Jay Forrester, is designed to help us [to] learn about the structure and dynamics of the complex systems in which we are embedded, design high-leverage policies for sustained improvement, and catalyse successful implementation and change. Drawing on engineering control theory and the modern theory of nonlinear dynamical systems, system dynamics often involves the development of formal models and management flight simulators to capture complex dynamics, and to create an environment for learning and policy design. Unlike pure engineering problems (if

> any exist)[,] human systems present unique challenges, including long time horizons, issues that cross disciplinary boundaries, the need to develop reliable models of human behaviour, and the great difficulty of experimental testing. (Sterman, 2000, p. 1)

Systems dynamics is a method for creating *explicit* models of complex systems (Forrester, 1994). It applies several techniques not commonly found in other methods of modelling. Arguably the most powerful of these techniques is positive and negative feedback loops. Feedback loops describe how variables affect one another, either reinforcing or subduing one another. Stocks (stockpiles) are the elements in a process that hold physical objects, and flows describe their movement from one stock to another. For example, for a university, new enrolments and graduates can be considered stocks, and the progression of new entrants to graduation a flow. Equations are developed describing changes in stocks and flows. These are programmed into a computer, and the unintended consequences of feedback loops over time can be better understood. This research used the software Vensim® version 7.3.5 (Ventana Systems inc, 2017).

2.2. Methods (2): Environmental scanning

Environmental scanning (Gordon & Glenn, 2009; Voros, 2003) is a common initial method used in a futures study. As the name suggests, it is a method for scanning the world around us to identify and collate information relevant to the proposed study. Environmental scanning contrasts with the traditional literature review method of focusing narrowly on a single topic, identifying a few key words by which to search and exploring a few specialised journals dealing with that single topic. Environmental scanning, on the other hand, casts a wide net, embracing not only multiple disciplines but also multiple sources of knowledge, including popular culture and media, and being especially attuned to the strengths and weaknesses of different sources of knowledge. The rigour of environmental scanning is dependent on the breadth of the material explored, the reliability of the material used and the strength of the connections between different sources – a process of triangulation (Carter, Bryant-Lukosius, DiCenso, Blythe, & Neville, 2014).

2.3. Methods (3): Agile recursion

Agile recursion is a qualitative method that we adapt by integrating the agile method from project management with recursion from a mathematical method for solving equations. The agile method in project management is a strategy whereby a core, simpler product is released early, and then the product is made more sophisticated with real world feedback. Recursion is a method used to solve complex equations for which no exact solution is known. The equation is repeatedly tested with variables to identify those that generate the closest correct answer. Our research method combines the agile method with recursion – our current paper is the result of multiple previous papers, with additions and refinements. The additions and refinements are a product of our own further analysis, recent research by other scholars and feedback from scholarly audiences.

2.4. Limitations

As George Box cautioned, "*All models are wrong, but some are useful*" (Box, 1979, p 2). Models are by necessity simplifications of a complex reality. The model developed and described here is for exploring the quantification of the complexities and inter-related feedback loops of a national education system. Our goal was to create a model that is simple and easy for others to understand, but sophisticated enough to represent some underlying principles and to attract others to further study and to contribute to the issues being presented.

This paper draws data from the Australian education system. Other countries have different systems. While other countries have somewhat different systems and educational cultures, we believe that

education systems have substantially similar structures, such that our model can be adapted for different countries.

3. Model justification

3.1. Paradigm changing developments in the science of learning

Our current education system has evolved over centuries, shaped by philosophical, cultural and economic paradigms. The science of learning has matured substantially in the last few decades, and traditional paradigms that have informed the education system are now overruled by science (Oakley, 2014, 2017; Oakley & Sejnowski, 2014, 2017; Somasundaram, 2018; Somasundaram, Rasul, & Danaher, 2019). We briefly list five key changes in our scientific understanding that are yet to be widely implemented in educational practice (readers wishing to explore these paradigms are encouraged to read the literature cited in the previous sentence):

i. We have two valuable ways of thinking. The psychologist Daniel Kahneman popularised the terms "fast thinking" and "slow thinking" to describe these two ways of thinking. Education overwhelmingly concentrates on slow thinking, and is often quite dismissive of fast thinking.
ii. Learning is changes in connections between nerve cells. We now have a much better appreciation of the underlying biological mechanisms of learning, and this informs us of which current learning practices are with or without merit.
iii. Sensory-motor, emotional, social and cognitive functions are all closely integrated. Education currently focuses on cognitive skills. However, the brain functions as an integrated whole and we need all aspects of the brain to function well to be fully effective citizens. The 'soft skills' that employers demand, and that education traditionally viewed as difficult to teach, are primarily emotional and social skills for which rigorous, science-based curricula can be developed.
iv. Motivation: habits trump will-power. The current education system lauds willpower. However, willpower drains energy and cannot be sustained. Individuals are better off building good habits, and designing their environment to facilitate task completion and to minimise distractions.
v. Sensitive periods in human development provide windows of both greater opportunity and greater danger. Different parts of the brain have different patterns of growth and decay. These are times when neural connections and learning are most effective and efficient. The most significant of these periods, and the one that receives virtually the least educational funding, is infancy.

3.2. Implications of the new paradigms explored in the model

Our model is thus based on the argument that the science of learning has matured sufficiently that it can be taught to students in a rigorous, scientific curriculum so that they can become self-regulated learners. With self-regulated learners, education can be delivered much more economically and effectively (multiple factors come into play, such as faster and more effective learning, improved classroom dynamics and reduced needs for costly direct teaching and classroom buildings). Furthermore, infancy is a crucial sensitive period but is a period that is largely ignored in current education policy. The model explores the impact of investment in infant learning.

4. Model description

The model is a simulation of the educational systems of a country delivering two types of skills: (1) Self-Regulated Learning Skills (SRLS); and (2) disciplinary skills (skills directly related to future work and employment). The model explores the impact of funding three initiatives. The three initiatives are (1) the funding of a Parents as First Teachers (PAFT) programme; (2) changing the ratio of school curricula devoted to self-regulated learning skills compared to disciplinary skills; and (3) the funding of Independent Credentialling Institutions (ICOs). ICOs are respected institutions that assess candidate skills and issue degrees and other work-related credentials but do not engage in teaching. ICOs are an alternative to universities and other post-secondary institutions but operate at a much lower cost (Somasundaram, Bowser, & Danaher, 2006).

The outcome of interest is well-being. Increasing SRLS has two impacts: (1) it directly contributes to well-being; and (2) it increases the impact of educational funding allocated to disciplinary skills. In comparison, disciplinary skills increase public revenue. However, disciplinary skills, if not used regularly, get forgotten and become obsolete (Walter & Lee, 2022). A proportion of public revenue feeds back into education funding, and the balance is used to fund other well-being services.

Figure 1 is a visual depiction of the model as seen by the user. At the top right-hand corner are three sliders for adjusting: (1) PAFT ratio; (2) ICO ratio; and (3) the skills ratio (the extent to which self-regulation skills are included in the school curriculum). At the bottom right-hand corner is the outcome variable of interest: Well-being.

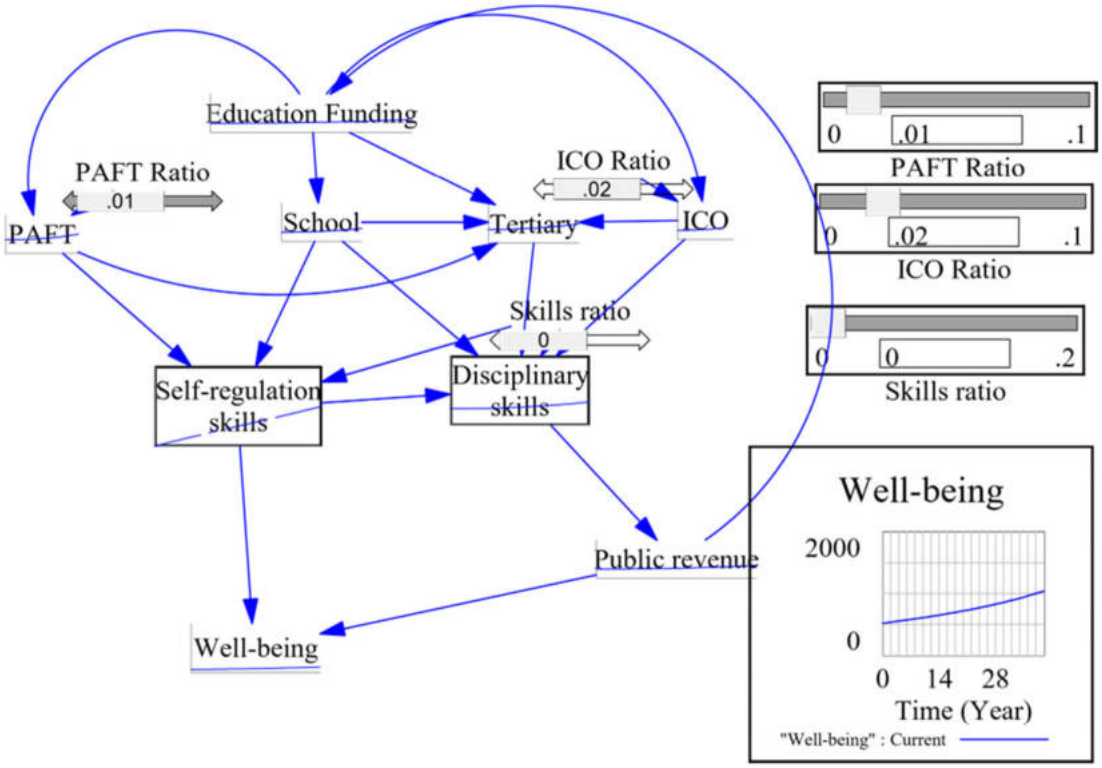

Figure 1: Graphical depiction of systems dynamics model of the education industry.

A copy of the model can be downloaded from https://drive.google.com/file/d/1ULcnTeXh4tSRpnM-eFUjLzTJVtWW6O_1/view?usp=sharing

Table 1 is a table of the formulae and constants used in building the model. The formulae, while not immediately visible to the user, can be viewed and modified by clicking on the relevant objects visible in Figure 1.

Table 1: Formulas and constants used in the model

	Name	Units	Range From	Range To	Start Value	Formula
User modifable	PAFT Ratio	% of Educational funding	0	0.1		
	Skills ratio	% of School funding for Self-regulation skills	0	0.2		
	ICO Ratio	% of Educational Funding	0	0.1		
Stcks	Disciplinary Skills	$ Billions			561 B	0-(Disciplinary skills/73)-(Disciplinary skills*0.02)+Tertiary*0.0544*(1+"Self-regulation skills")+School*0.709*(1-Skills ratio)*(1+"Self-regulation skills")+ICO*0.0544*2*(1+"Self-regulation skills")
	Self-regulation Skills	% change compared to simulation start			0%	((PAFT*3+(School*Skills ratio))*0.2)/17 - "Self-regulation skills"/83
Variables	Education Funding	$ Billions				Public revenue*0.073
	PAFT	$ Billions				Education Funding*PAFT Ratio
	School	$ Billions				Education Funding*0.622
	Tertiary	$ Billions				Education Funding-ICO-PAFT-School
	ICO	$ Billions				Education Funding*ICO Ratio
	Public revenue	$ Billions				Disciplinary skills
	Wel-lbeing	$ Billions				Public revenue*(1-0.073)+"Self-regulation skills"*561
Hidden Constants	life expectancy	Years	83			
	Allocation to Education	% of revenue	0.073			
	Allocation to Schools	% of Education revenue	0.622			
	PAFT return over schools	%	3			
	Well-being Contribition from Self regulation	$ Billions	561			
	Loss of skill due to Forgetfullness	%	0.02			
	Return from HE investment	%	0.0544			
	Return from School Investment	%	0.709			

Data Sources:

https://www.aihw.gov.au/reports/life-expectancy-death/deaths-in-australia/contents/life-expectancy

https://www.dese.gov.au/higher-education-statistics/resources/award-course-completions-pivot-table

https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/BudgetReview201920/EducationTraining

https://grattan.edu.au/report/graduate-winners-assessing-the-public-and-private-benefits-of-higher-education/

A copy of the table can be downloaded from https://docs.google.com/spreadsheets/d/1M2xHDecWTvv0AkMTMRgVKfWJ8eSM6g4P/edit?usp=sharing&ouid=104466710374660343241&rtpof=true&sd=true .

5. Discussion

I often say that when you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely in your thoughts advanced to the state of Science, whatever the matter may be.

Lord Kelvin, prominent 19th century scientist and engineer
(Thomson, 1883/1891, p. 80)

Public policy decision-making demands quantification. How much money should we invest in education? And is the money better spent on education or some other service? The purpose of this model is to explore the proposed structural redesign through quantified analysis. The complex nature of education, and its multiple stakeholders, with their different and multiple benefits and harms associated with different funding decisions, create policy resistance and unintended consequences. Different stakeholders will have different goals and perspectives, and will subtly influence the policy, the action taken and the results. In translating institutional research into action, there is a need to take a wider perspective of the system and to engage in robust policy formation.

6. Conclusion

The theme of this year's conference is "New Normal Education: Transitioning, Transforming and Technologies Agenda". In this paper, we propose that developments in the human sciences, and in particular the science of learning, allow us to plan and design a preferred new normal scientifically. But achieving this preferred new normal will require embracing a disruptive agenda, with substantial changes to existing educational sectors. We also present a quantitative model for exploring the impacts of such a transformative agenda.

On the other hand, recent events have left many of us exhausted. Are we willing to choose a transformative agenda for education – one that will cause substantial industrial turmoil (Figure 2)?

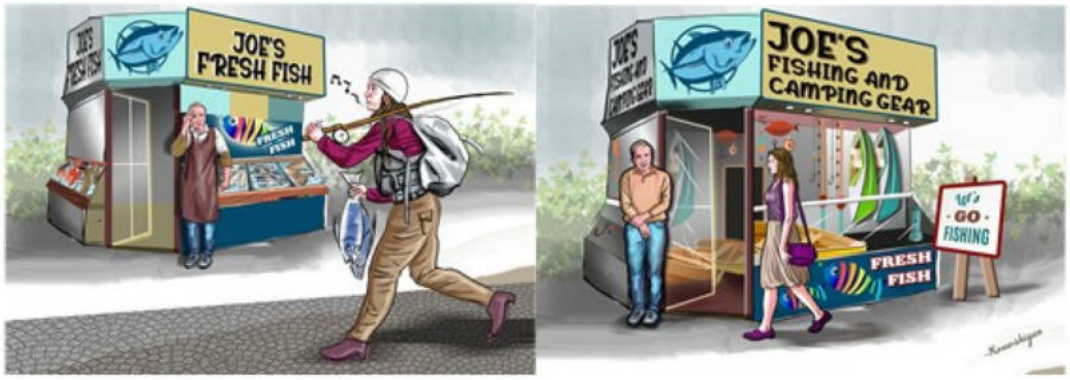

Figure 2 (Kouwshigan & Somasundaram, 2020): If all members of adult society became capable of self-regulated learning, then there would become far less need for teachers of adults. However, demand for instructional design products such as textbooks and assessment items would increase substantially as more people became engaged in rigorous lifelong learning.

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Does Institutional Governance Matter in Academics' Job Attitudes? A Comparative Study in Taiwan, Japan, and Korea

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ABSTRACT

In the past few decades, higher education institutions (HEIs) in East Asia have undergone significant changes, increasing emphasis on global competencies and the rising influence of institutional governance, which have significantly impacted academics' job attitudes toward workplaces (Huang, 2020). This study explores how institutional governance influences academics' job attitudes (job satisfaction and job inability) in East Asia, respectively, Taiwan, Japan, and Korea. A total of 4,084 participants, including 1,224 Taiwanese, 2,013 Japanese, and 847 Korean academics, were recruited to complete the international *Academic Profession in the Knowledge Society* (APIKS) survey, examining the change of academic work in HEIs. Two findings are made: (1) Institutional governance of *good communication between management and academics* significantly and positively predicts academics' job satisfaction; and (2) The effects of institutional governance of *a cumbersome administrative process* on academics' job inability were significantly moderated by respondents' tenure, with stronger relationships observed in tenured academics than non-tenured ones in Taiwan, Japan, and Korea. This study provides insight into the relationship between institutional governance and academics' job attitudes toward working environments in these three East Asian countries. It also offers empirical evidence for HEIs and administrators to implement academic policies and leadership to promote better governance and academics' job attitudes in HEIs.

Keywords: Academic Profession in the Knowledge Society (APIKS), Institutional governance, Japan, Job inability, Job satisfaction, Korea, Taiwan

Introduction

Higher Education Institutions (HEIs) have introduced substantial reforms in their institutional governance and management policies over the past few decades. Since the late 1980s, impacted by new drivers such as globalization, marketization, advancement of informational technology, and growing international competitiveness, the academic profession has faced diverse and numerous challenges (Altbach, 2017; Enders, 1999). In East Asia, changes that have occurred in the academy have been affected by financial pressure, blurring academic identity, increasing emphasis on research activities of HEIs, and competition for excellence and world-class universities resulting from national implications of various drivers and their institutional governance and management (Amano, 2014; Huang, 2011). In addition, managerial work has increased in recent years with managerial reforms such as the new public management that accompanies performance-based management, budget short-cuts, and efficiency-oriented management, which may inevitably affect academics' job attitudes (e.g., Fredman & Doughney, 2012).

The controversial perspectives on academic work are explained by two dimensions of intrinsic motivation and external work conditions, borrowing a theoretical concept from Herzberg et al.'s (1959) motivational and hygiene factors (Houston et al., 2006). Based on the previous studies, intrinsic motivation is related to the job itself and is a cause of job satisfaction. On the other hand, work conditions are related to the work environment, which can cause job inability. These studies explain the nature of the academic job where academics are satisfied with the job itself, but their work environments are getting less favorable under the institutional governance (e.g., Fredman & Doughney, 2012; Houston et al., 2006). In this regard, one may wonder to what extent the institutional governance may affect job satisfaction and job inability, consequently, the academics' commitment to the working environments (Teichler & Höhle, 2013).

Literature review

Individual factor differences in academics' job satisfaction and job inability

In many countries, academia is one of the occupations with the greatest likelihood of experiencing burnout, perhaps leading to job inability (von Hippel et al., 2019). However, the results from the large-scale ''The Changing Academic Profession'' study concluded that despite these changes, academics in several countries have generally preserved a high sense of autonomy and professional identity, established good communication with institutional administrators, and expressed high levels of job satisfaction (Bentley et al. 2013; Teichler et al. 2013). Different higher education policies may bring about differing rates in the growth of diversity (Teichler, 2010). In this regard, one may also refer to the increasing diversification of academic roles (Novotny, 2017), which contributes to the heterogeneity of the profession across different individual factors. Over the past few decades, HEIs in East Asia, in order to strengthen their competitiveness within the global market, have been pressured to adopt some of the market-oriented changes taking place at universities worldwide (Mok, 2007; Mok & Chan, 2008; Mok, 2010). Because of these changes, university faculty have become more dependent on grant-based financing (Jun, 2010; Lin & Hossler, 2014), and they have been pushed to strive for "excellence'' in research in order to succeed in grant competition (Li et al., 2012; Shin & Cummings, 2010). Shin and Jung (2014) further indicated that research-oriented academics might receive more funds from external educational sources and academic support and encouragement from HEIs, therefore, carry out more interdisciplinary research publications and outcomes and have higher job satisfaction, sense of autonomy, and achievements than teaching-oriented ones. Moreover, of gender differences in East Asia, even though female peers are more likely to hold non-tenure-track and adjunct positions than male ones (Ching, 2021; Huang, 2020), tenure is a goal and an accomplishment for many male and female academics, and one's location on the tenure ladder may affect satisfaction (Dobrow Riza et al., 2018).

Gaining tenure in an academic position indicates success and prestige and most often contributes to overall job satisfaction (Lee, 2021). Overall, the study will first compare the individual factor differences in academics' job satisfaction and job inability to examine the diversification of academic roles in HEIs in Taiwan, Japan, and Korea.

H1: There are significant differences in academics' job satisfaction and job inability by different individual factors in Taiwan, Japan, and Korea.

Theoretical Framework— Situational Institutional Governance Job Demands—Resources (SIGJD-R) Model

It is generally acknowledged that institutional governance plays a decisive role in determining the quality and identity of national higher education systems, influencing academics' job satisfaction and job inability (Zábrodská et al., 2018). While institutional governance and its impact on academics' job attitudes have been discussed considerably in international contexts, few attempts have used comprehensive theoretical models to understand this relationship. In this study, we propose to investigate the impact of institutional governance on academics' job satisfaction and job inability within the framework of the Situational Institutional Governance Job Demands—Resources (SIGJD-R) Model, which combines the situational institutional governance theory (Hersey & Blanchard, 1969) and Job Demands—Resources (JD-R) Model (Bakker et al., 2014). Situational institutional governance theory assumes that the most effective style of institutional governance changes from situation to situation. To be most effective and successful, an institutional administrator must be able to adapt his style and approach to diverse circumstances. Hersey and Blanchard (1969) indicated two crucial types of institutional governance: (1) Task/directive-oriented institutional governance: the extent to which the institutional administrator tells the follower what, how, where, and when to do; and (2) Relationship/supportive-oriented institutional governance: the extent to which the institutional administrator engages in open dialog with the follower, actively listens and provides recognition/reinforcement for task-related progress. The JD-R model proposes two broad job characteristics that independently influence academics' job attitudes: (1) Job demands: job aspects that require sustained effort and are associated with emotional, mental, and physical demands; and (2) Job resources: factors functional in stimulating personal growth, social support and achieving work goals (Bakker et al., 2014). In this study, we develop six survey items based on the SIGJD-R model to explore the relationships between institutional governance and academics' job satisfaction and job inability (Figure 1).

H2: Institutional governance can significantly influence academics' job satisfaction and job inability in Taiwan, Japan, and Korea.

Furthermore, globalization and the aim to become world-class have led to competition between HEIs in East Asia, and these new environments bring changes to institutional governance and management (Shin et al., 2011). Recently, the global competition for world-class status has had different effects on different HEIs, particularly East Asian countries are enormously challenged (Shin & Kehm, 2013). After the 1990s, many East Asian countries tried to improve their global competencies and status by advancing HEIs (Mok, 2013). Therefore, with policy initiatives based on neoliberal ideas focusing on competition, coupled with changes in school-aged populations due to the reduction of birth rate, HEIs are in a dilemma in which they must strike a balance between substantial government interruption and practices of market-oriented ideology. Therefore, academic job stability is worse than before, and the average age of appointment as an assistant professor has risen (Aichinger et al., 2017). In this sense, permanent or tenured positions, which are inflexible positions, are an economical and managerial burden in the organizational aspect. Therefore, as a result, there has been a severe cutback in the recruitment of faculty members, and the number of contract-based or part-time positions has increased (Faraji et al., 2015). Yet it is necessary to understand how tenured or non-tenured academics perceive and react to their work environments and job attitudes under institutional governance. In conclusion,

this study further examines tenure's moderating effect on the relationships between institutional governance and academics' job attitudes in Taiwan, Japan, and Korea.

H3: The relationships between institutional governance and academics' job satisfaction as well as job inability can be significantly moderated by tenure in Taiwan, Japan, and Korea.

Aim of the Study

The primary purpose of the present article was to explore further the relationships between institutional governance and academics' job attitudes in Taiwan, Japan, and Korea. The study adopts the SIGJD-R model, which provides a framework for the comprehensive evaluation of critical characteristics of institutional governance and their relationships with multiple dimensions of academics' job satisfaction and job inability. In this way, the study makes three main contributions to the literature. First, the study explores a broader concept of academics' job attitudes, encompassing both its positive and negative aspects by different individual factors (academic field, tenure, gender, and academic preference), which contrasts with the dominant focus of much of the extant research on job satisfaction and job inability. Second, the study investigates multiple processes through which institutional governance interacts with different aspects of academics' job satisfaction and inability, implementing a well-established theoretical framework provided by the SIGJD-R model. This is in contrast to other research, which has typically examined only linear relationships between the academic environment and their job attitudes without a coherent theoretical framework. Third, the study provides further insight into the potential moderating effect of tenure on cultural and contextual differences in institutional governance factors influencing the job attitudes of academics from a far under-researched context of Eastern Asia countries in Taiwan, Japan, and Korea.

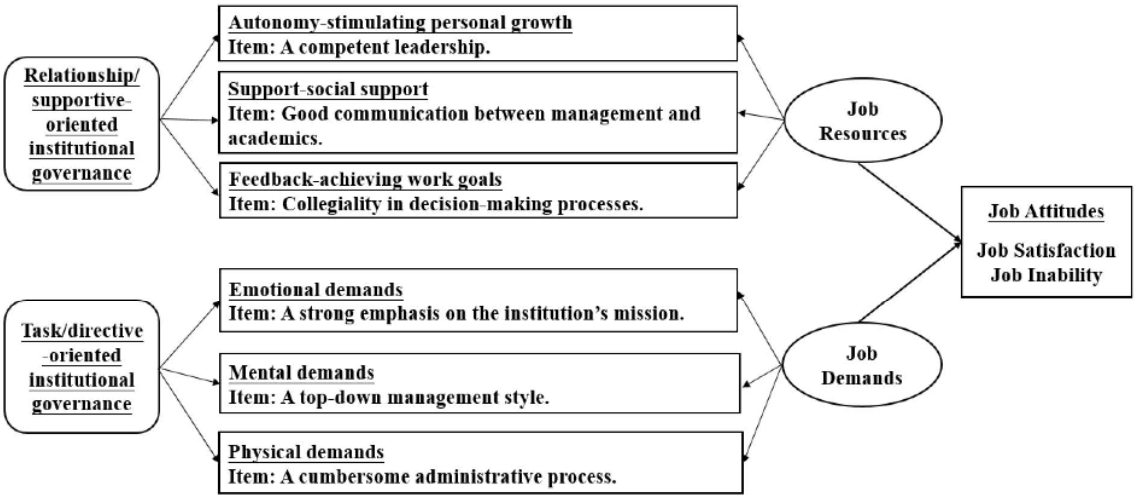

Figure 1: SIGJD-R model

Methodology

Data Collection

The study uses data from the international comparative survey of the *Academic Profession in the Knowledge-based Society* (APIKS). This survey was conducted in over 30 countries spanning six

themes: career and professional situations, general situations and activities, teaching, research, external activities, governance and management, and academics in formative career stages (APIKS-IDB, 2021). All participating countries used the same survey questions and the data was collected in 2019. Based on our research purpose, the analytical variables used in this study were extracted from APIKS, including four questions about the respondents' background (academic field, tenure, gender, and academic preference), six items assessing institutional governance, three items examining academics' job satisfaction, and four items evaluating academics' job inability. The 4,084 staff members, including 1,224 Taiwanese, 2,013 Japanese, and 847 Korean academics, were used in the study after missing values were excluded from the analysis with a 65.9% valid response. To verify the sample's representativeness, we have compared the demographic distribution of the population and sample of this survey. We confirmed that the survey respondents represent the total population relatively well according to their factors.

Variables and Measures

This study used three variables (institutional governance, job satisfaction, and job inability) to answer the research hypotheses. All participants were asked to rate the frequency with which they experienced these instructional practices using a 5-point ordinal response scale (1= strongly disagree to 5= strongly agree). An Exploratory Factor Analysis (EFA) was conducted on the data from each country to examine the variables' construct validity and internal consistency.

First, *Institutional Governance* variable included six survey items. Principal axis factoring with varimax rotation was used to assess the construct validity. The total variances explained by the six items were 67.67%, 73.72%, and 61.02%, with factor loadings ranging from .673 to .877, from .787 to .920, and from .600 to .829 for the Taiwan, Japan, and Korea samples, respectively. Besides, the internal consistency of each variable is tested using Cronbach's alpha. The reliability coefficients for the construct in the Taiwan, Japan, and Korea datasets were .882, .827, and .880, respectively.

Second, *Job Satisfaction* variable included three survey items. Principal axis factoring with varimax rotation was used to assess the construct validity. The total variances explained by the three items were 66.65%, 70.03%, and 69.14%, with factor loadings ranging from .664 to .833, from .767 to .879, and from .804 to .852 for Taiwan, Japan, and Korea samples, respectively. Besides, the internal consistency of each variable is tested using Cronbach's alpha. The reliability coefficients for the construct in the Taiwan, Japan, and Korea datasets were .801, .882, and .876, respectively.

Last, *Job Inability* variable included four survey items. Principal axis factoring with varimax rotation was used to assess the construct validity. The total variances explained by the four items were 64.72%, 69.05%, and 65.49%, with factor loadings ranging from .697 to .824, from .725 to .858, and from .766 to .857 for Taiwan, Japan, and Korea samples, respectively. Besides, the internal consistency of each variable is tested using Cronbach's alpha. The reliability coefficients for the construct in the Taiwan, Japan, and Korea datasets were .875, .868, and .889, respectively.

Data Analysis

To examine our research hypotheses, we proposed three research frameworks. First, for the model development, we analyzed the data using descriptive statistics and compared the responses from individual backgrounds (Appendix 1). Independent *t*-test was adopted to compare the differences in academics' job satisfaction and job inability by different individual factors. Second, to test the SIGJD-R model, multiple hierarchical regression was used to explore the relationships between institutional governance and academics' job attitudes (job satisfaction and job inability) (Appendix 2). Finally, to further examine the moderating effect of tenure on the relationships between institutional governance to academics' job satisfaction and job inability in three Asian countries, moderated multiple hierarchical

regression was conducted to confirm the relationships among each item of three variables (Appendix 3).

Results

Descriptive statistics and difference analysis comparison

The study revealed significant tenure and gender differences in academics' job satisfaction: (1) Tenured academics had significantly higher job satisfaction than non-tenured ones in Taiwan, Korea, and Japan; and (2) Male academics had significantly higher job satisfaction than female ones in these three East Asian countries. However, no significant differences were found across academic fields and academic preferences. Besides, the study indicated that there were significant academic field, tenure, gender, and academic preference differences in academics' job inability: (1) Applied field academics had significantly higher job inability than non-applied field academics in Taiwan and Korea; (2) Non-tenured academics had significantly higher job inability than tenured academics in Taiwan, Korea, and Japan; (3) Female academics had significantly higher job inability than male academics in Japan and Korea; and (4) Teaching-oriented academics had significantly higher job inability than research-oriented academics in Japan.

Multiple Hierarchical Regression Analysis

To examine research hypothesis 2, the study adopted multiple hierarchical regression models to examine the predictive effects of each item of institutional governance on academics' job satisfaction and job inability in Taiwan, Japan, and Korea after controlling for individual factors. Table 1 shows that *A competent leadership* can significantly and positively predict academics' job satisfaction in Taiwan and Japan; *Collegiality in decision-making processes* can significantly and positively predict academics' job satisfaction in Taiwan and Korea. *Good communication between management and academics* can significantly and positively predict academics' job satisfaction in Taiwan, Japan, and Korea. Moreover, it also revealed that *A top-down management style* and *A cumbersome administrative process* could significantly and positively predict academics' job inability in Taiwan and Japan. As shown in Table 1, except for the predictive effect of institutional governance variables, it also pointed out that individual factor "tenure" could significantly and negatively predict academics' job inability. To further explore the relationships between "tenure" and institutional governance variables on academics' job attitudes. We proposed research hypothesis 3, and adopted moderated multiple hierarchical regression analysis to examine how the effects of each item of institutional governance on academics' job satisfaction and job inability are moderated by tenure. According to Table 2, these regressions showed statistically significant moderating effects of tenure on the relationship between institutional governance variable *A cumbersome administrative process* and academics' job inability in Taiwan ($\beta = .236$, $p < 0.05$), Japan ($\beta = .258$, $p < 0.05$), and Korea ($\beta = .266$, $p < 0.05$). In conclusion, the results showed that while facing cumbersome administrative processes, tenured academics may have higher job inability than non-tenured academics in Taiwan, Korea, and Japan.

Table 1: Regression analysis of academics' job satisfaction and job inability through institutional governance in Taiwan, Korea, and Japan

	Taiwan		**Japan**		**Korea**	
	job satisfaction	job inability	job satisfaction	job inability	job satisfaction	job inability
Control variables						
Academic Field	.013	.062*	.001	.016	.015	.082*
Tenure	-.017	-.058*	.115***	-.101***	.222***	-.111**
Gender	-.041	.010	-..014	.074***	-.058	.075*
Academic preference	-.013	.010	.026	-.082***	-.045	-.063
Independent variables-Institutional governance						
A competent leadership	**.093***	-.012	**.127****	-.040	.072	**-.107***
Good communication between management and academics	**.170*****	**-.097****	**.294*****	**-.276*****	**.189*****	-.044
Collegiality in decision-making processes	**.130*****	-.040	.017	.005	**.191*****	**-.190*****
A strong emphasis on the institution's mission	.021	-.053	.049	.026	-.059	.030
A top-down management style	-.002	**.083****	**-.283*****	**.180*****	-.046	.025
A cumbersome administrative process	**-.132*****	**.063***	**-.249*****	**.118*****	.058	.733
***F* value**	22.062***	16.862***	28.938***	15.025***	19.481***	19.305***
Adj R^2	.154	.146	.126	.165	.218	.205

Note. *$p < .05$; **$p < .01$; ***$p < .001$

Table 2: Regression analysis of the moderating effect of tenure on the relationships between institutional governance to academics' job satisfaction and job inability in Taiwan, Korea, and Japan

	Taiwan		**Japan**		**Korea**	
	job satisfaction	job inability	job satisfaction	job inability	job satisfaction	job inability
Control variables						
Academic Field	.013	.061	.001	.017	.014	.078
Tenure	-.020	-.257**	.127	-.139***	-.263	-.135***
Gender	-.040	.010	-.011	.074	-.057	.073
Academic preference	-.014	.009	.027	-.083	-.047	-.061
Independent variables-Institutional Governance (IG)						
A competent leadership **(IG-1)**	-.043	.088	.418**	-.055	-.036	-.011
Good communication between management and academics **(IG-2)**	.232	-.164	.378**	-.462***	.143	.057
Collegiality in decision-making processes **(IG-3)**	.330	-.273	-.009	.067	.148	-.150
A strong emphasis on the institution's mission **(IG-4)**	-.035	.259	.070	.100	.094	.060
A top-down management style **(IG-5)**	.162	.223	-.381***	.075	-.104	-.165
A cumbersome administrative process **(IG-6)**	-.354*	.297***	-.454***	.338***	.084	.332**
Interaction variables						
IG-1* Tenure	.160	-.124	-.133	.016	.160	-.148
IG-2* Tenure	-.075	.082	-.105	.229	.065	-.145
IG-3* Tenure	-.229	.264	.022	-.077	.059	.201
IG-4* Tenure	.067	-.380	-.051	-.087	-.247	-.052
IG-5* Tenure	-.190	-.167	.148	.122	.100	.324
IG-6* Tenure	.258	**.236***	.254	**.258***	-.057	**.266***
***F* value**	14.020***	14.688***	19.385***	19.864***	19.481***	16.142***
Adj R^2	.157	.146	.134	.166	.218	.204

*$p < .05$; **$p < .01$; ***$p < .001$

Discussion

This research explores how institutional governance relates to academics' job satisfaction and job inability in Taiwan, Japan, and Korea. Three significant findings from this investigation are noteworthy and add value to current institutional governance in HEI literature. The first finding to note is the effect of individual factor differences on academics' job satisfaction and job inability, further exploring the heterogeneity of the academic profession varying across academic fields, tenure, gender, and academic preference in Taiwan, Japan, and Korea. Regarding the academic field, previous studies indicated that academics would receive satisfaction from teaching no matter the academic field, as long as they have a friendly working environment (Retelsdorf et al., 2010; Retelsdorf & Günther, 2011). Thus, there was no significant academic field difference in academics' job satisfaction (Devos et al., 2012). However,

in this study, we found that applied field academics have higher job inability than pure field academics in Taiwan and Korea. Comparing tenure, competitive and unfair academic job conditions reduce the job satisfaction of non-tenured academics and act as a cause of job inability in working environments, echoing the work of Lee (2021) and Waltman et al. (2012) while providing further insight into academics' professional development in Taiwan, Japan, and Korea. Regarding gender, female academics usually have higher job inability than male counterparts because of work-family conflict, lower opportunities for promotion, and worse social protection, consistent with Hicks (2015). Comparing academic preferences, Geschwind and Broström (2015) indicate that research-oriented academics have higher job satisfaction than teaching-oriented ones because of funding and educational resources support. Our study extended the previous findings and found that most HEIs in Japan attach great importance to academics' research performance and place higher research expectations on these academics, continually encouraging international research cooperation to improve international reputation and world ranking performance.

The second noteworthy finding is the significant predictive effects of institutional governance on academics' job satisfaction and job inability in Taiwan, Japan, and Korea. The study showed that the SIGJD-R model fit our data well and largely confirmed our hypotheses regarding institutional governance on academics' job attitudes relationships. In the SIGJD-R model, job resources (including stimulating personal growth, social support, and achieving work goals) predominantly combined with relationship/supportive-oriented situational institutional governance (*a competent leadership*, *good communication between management and academics,* and *collegiality in decision-making processes*) can significantly predict academics' job satisfaction. Moreover, job demands (including emotional, mental, and physical) predominantly combined with task/directive-oriented situational institutional governance (*a strong emphasis on the institution's mission*, *a top-down management style,* and *a cumbersome administrative process*) can significantly predict academics' job inability. These findings provide further support for the existence of dual processes through which situational institutional governance influences different aspects of academics' job satisfaction and inability, as hypothesized by situational institutional governance theory (Hersey & Blanchard, 1969) and Job Demands—Resources (JD-R) Model (Bakker et al., 2014). This suggests that distinct relationships between the situational institutional governance and various facets of academics' job attitudes should also be considered in the context of academic workplaces (Barkhuizen et al., 2014; Boyd et al., 2011), especially in Taiwan, Japan, and Korea.

The third finding of note in this study sheds light on both the main effects of tenure on academics' job inability, and the moderating role of tenure on the relationship between institutional governance and academics' job inability with stronger among tenure academics than non-tenure in three East Asian countries. HEIs in East Asian countries generally consider recent policy changes have further increased competition for relatively scarce resources by putting more substantial pressure on academics' productivity (e.g., by linking university budgets to the number of research publications) and measurement of performance (e.g., by increasing the importance of quantitative indicators, such as the h-index, in evaluating academics' productivity) (Di Gropello, 2011; Huang, 2020). In addition, the managerial reforms require academics to do more administrative work, increase their teaching hours, and undertake more entrepreneurial activities and community service to satisfy their administrators and external stakeholders (Shin & Jung, 2014). As results, academics' workloads are increasing in many countries, especially for tenured academics under vital managerial reforms (Santiago & Carvalho, 2008). Their increased workload has negatively impacted the balance between their work and personal lives. Tenured academics always spend much more of their weekends dealing with their increased workloads than non-tenured academics (Lee et al., 2022; Porter & Umbach, 2001). The study was consistent with the previous studies showing that academics' job satisfaction is declining, and job ability is increasing in the countries with new solid public management systems.

However, our findings extend the value of moderating effect of tenure indicating that institutional governance of *a cumbersome administrative process* can significantly predict academics' job inability

in Taiwan, Japan, and Kore, with stronger relationships observed in tenured academics than non-tenured. These findings serve as a reminder to institutional governors that more friendly and flexible working environments for tenured academics can help them to enhance positive thinking and well-being in working conditions. As a result, finding ways to decrease the job inability of academics will be also a core issue in future managerial reforms, particularly in East Asian bureaucratized national HEIs.

Research limitations

Although the current study provides insight into factors that contribute to institutional governance on academics' job attitudes, like all studies, several limitations should be considered. First, the study questionnaires were based on self-reported items, which might raise the possibility of the social desirability effect (Althubaiti, 2016). Therefore, future studies could consider mixed methods to collect qualitative and quantitative data for more valuable evidence. Second, the study only focuses on East Asian data. Though we are confident that findings reliably reflect these areas of Taiwan, Japan, and Korea, we cannot hold equal confidence that the results fully generalize to other parts of the world. Future research might extend this exploration into international comparative studies by examining the longitudinal quantitative data to understand individual background differences and assess how institutional governance influences job satisfaction and inability in academics. Although the SIGJD-R model explained a significant portion of the variance, a large portion of variance influencing academics' job attitudes remains unexplained. This suggests that other factors not included in our study might have had a similar or even larger impact on academics' job attitudes. Future studies may continue to examine other potential variables that might relate to academics' job satisfaction and job inability and compare these variables' relative importance and unique contributions with institutional governance.

Conclusions and recommendations

The study adopted the SIGJD-R model to explore the relationships between institutional governance and academics' job attitudes of academics in Taiwan, Japan, and Korea. As the primary outcome, our results essentially confirmed the "dual processes" in academic workplaces, as the included job resources and job demands were relatively independently associated with relationship/supportive-oriented and task/directive-oriented institutional governance on academics' job satisfaction and job inability. In particular, job resources appeared to be related to job satisfaction, with the support from institutional administrators and *good communication between management and academics* having the most significant effects in three East Asian countries. Our results also showed the moderating role of tenure on the institutional governance- *a cumbersome administrative process* and academics' job inability suggests HEIs put more emphasis on tenured academics' job inability and find proper methods to improve the administrative and working pressure of tenured academics in Taiwan, Japan, and Korea.

However, a comparative perspective using multinational samples would need to be implemented to better understand the effects of different job resources/demands on academics' job satisfaction and job inability across different systems of higher education institutional governance. In conclusion, despite some limitations mentioned above, the initial findings of the study provide fresh insights and potential implications into the existing model of SIGJD-R and make a clear understanding of the differences and relationships between institutional governance and academics' job attitudes of academics in Taiwan, Japan, and Korea that can be used as an evidence-oriented reference for HEIs to improve higher education development.

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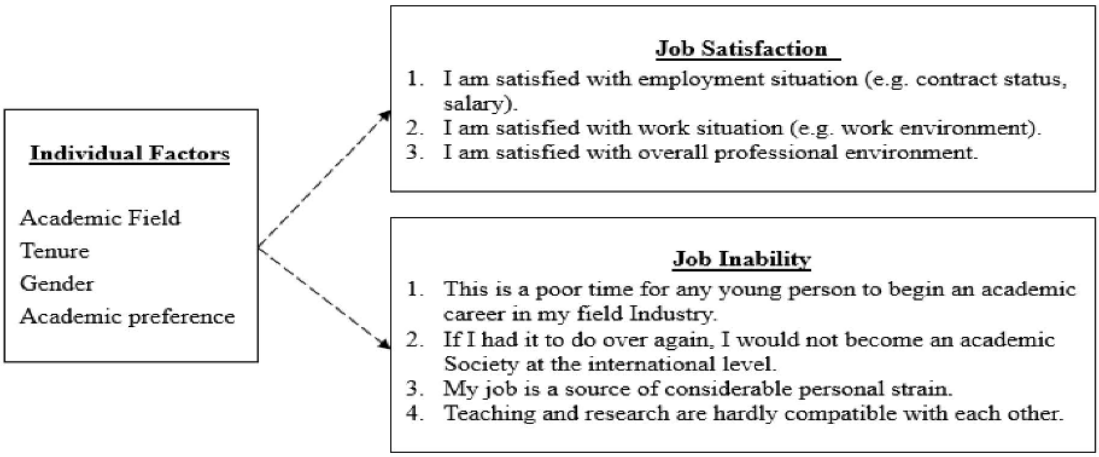
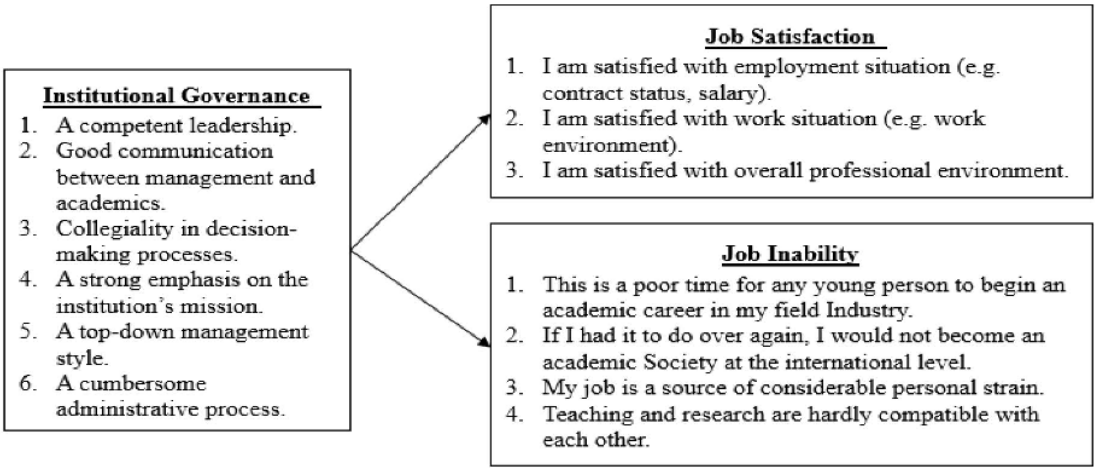
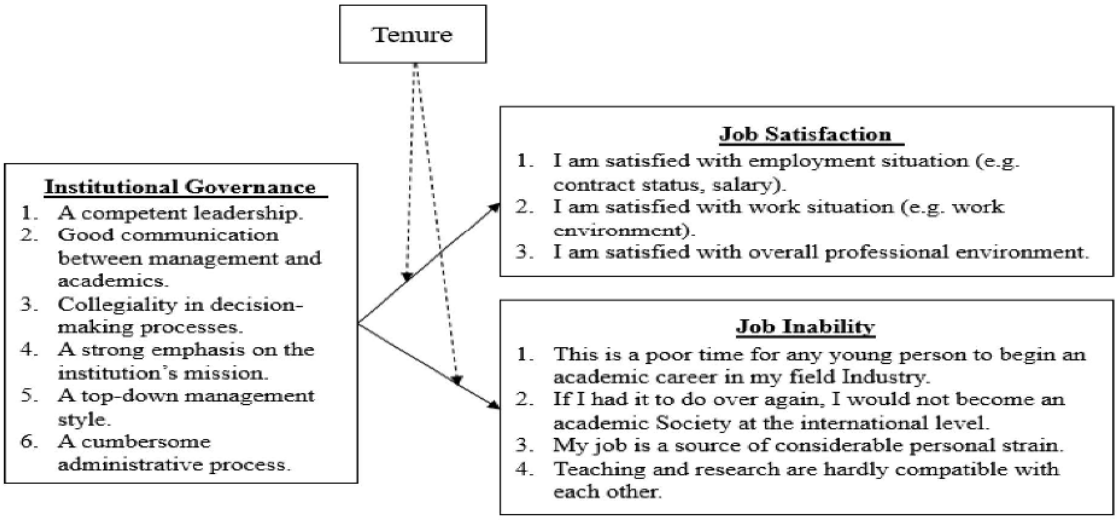
Appendix



Appendix 1: Research Framework of the Research Hypothesis 1



Appendix 2: Research Framework of the Research Hypothesis 2



Appendix 3: Research Framework of the Research Hypothesis 3

A social critical analysis on Philippine higher education in the time of covid-19 pandemic towards a framework on flexible learning

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ABSTRACT

The study intends to provide a framework on flexible learning. To arrive at such framework, there are three objectives of the study: first, to determine government policies that have significant impact in our democratic constitutional framework; second, to provide a social critical analysis on these government policies; and third, to articulate principles and mechanisms to address issues pertaining to the government policies. The study is anchored on the principles and standards of ADB Good Governance Framework and UNDP Good Governance Model centered on Philippine governance in the time of COVID-19 pandemic. It tries to describe the context of government policies and democracy in the midst of the health crisis, subject them to political analysis, with the end in view of articulating principles and mechanisms to endure this crisis and at the same time safeguard and further democracy in the country. The goal is to have a framework on good governance even in time of a pandemic contributory to a more effective public governance. Focusing on the health crisis would mean that the Government should not disrupt the systems and processes we have as a democratic regime. We need to continuously uphold democratic principles for they ensure our rights, freedoms, and common good. In this time of crisis, we need to uphold transparency and accountability, due process before the law, presumption of innocence, priority of basic rights and liberties, primacy of public reason, and political morality. As we realize, observe, practice, and internalize these principles, we need to challenge the Philippine Government by calling for decent government, meritocratic government, further democratization in the government, mass media empowerment, higher political efficacy, and public ethics.

Keywords: Philippine Education, COVID-19 Pandemic, Educational Praxis, Development Education

Introduction

Rationale

The school system was greatly affected by the COVID-19 pandemic across the world. Educational institutions around the world modified the way they do their education programs and activities to respond to the various protocols and systems implemented to protect the public and still promote education as a social good. Schools worldwide pushed through with the new school year given that we do not have yet reached herd immunity to counter and stop the spread of the SARS-COV 2. The Philippines did the same. The private schools started August 2020 and public schools October 2020 to address requirements given the challenges posed by online learning and module learning. The Philippines, as a developing country, adopts flexible learning for all Filipino students. With the shift to online learning and module learning, there is a huge challenge facing the Philippine education that is fully immersed to traditional modalities. There is a need to create a framework on online learning in Philippine education in the time of COVID-19 pandemic based on educational praxis and philosophies of education. The study is deemed significant for the reason that it provides alternative perspective on Philippine education in consideration of various philosophies of education given the context of COVID-19 pandemic. In effect, we are challenged to create a framework to address the said concerns.

Objectives of the Study

The study intends to create a framework on online learning in Philippine higher education in the time of COVID-19 pandemic. There are three objectives of the study: first, to determine the status of flexible learning in Philippine education in the time of COVID-19 pandemic; second, to provide challenges given the status; and third, to articulate principles to guide in addressing issues pertaining to flexible learning in our higher education system.

Theoretical Underpinnings

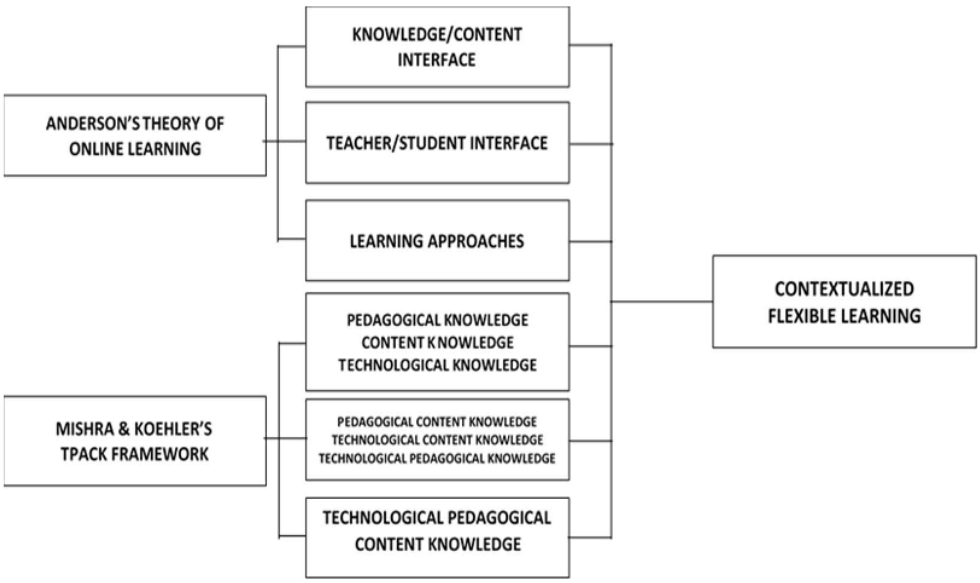

Figure 1: Theoretical Framework Model

The study considers two perspectives in order to have a good analysis of flexible learning this time of pandemic in the Philippine context. These are Terry Anderson's Theory of Online Learning and Punya Mishra & Matthew J. Koehler's TPACK Framework. The former provides us the necessary dynamic interplay between and among teachers, students, and content to generate solid interfaces between and among them resulting to collaborative learning, independent study, structured learning resources, and community of inquiry. The latter provides the three necessary elements to have a successful online/flexible learning which are content, pedagogy, and technology producing pedagogical content learning, technological content learning, and technological pedagogical knowledge leading to the core principle of technological pedagogical content knowledge.

Anderson's Theory of Online Learning

Anderson's Theory of Online Learning is fundamentally a model on e-learning demonstrating the interactions of learners and teachers relative to the knowledge/content. For Anderson, there are four overlapping components in effective learning environments. These are community-centered learning, knowledge-centered learning, learner-centered learning, and assessment-centered learning. Online learning communities can and should share a sense of belonging, trust, expectation of learning, and commitment to participate in and contribute to such communities and therefore students work together online to create new knowledge collaboratively. And whether the context is online or school-based, the internet provides a huge amount of information that provides opportunities to gather these resources and therefore learning becomes making connections with ideas, facts, people, and communities. This should not lose the premise that school stakeholders must provide strong support to students. The teacher, school, and the society itself have to create successful learner-centered environments and in effect create meaningful connections to the communities. With varying multiple modalities, formative and summative evaluation have to be part of the entire schema to ensure that targets and competencies are reached making the gap between the traditional and alternative modalities narrower. With these four lenses, education has to recognize the role of interactions in online learning. There has to be student-student interaction (which basically is collaborative learning), student-content interaction (which consists of interactive knowledge and customization of content), and student-teacher interaction (which defines the relationship between them in actual teaching and learning experience. The model in general is a multi-component learning environments enhancing the critical interaction in education in many varied creative ways. The Anderson Model is crucial in the paper for it highlights four components that underscore Philippine education contexts.

Mishra & Koehler's TPACK Framework

The TPACK Model is an integration framework of technological, pedagogical, and content knowledge. As a framework, it affirms three primary forms of human knowledge, which are content knowledge, pedagogical knowledge, and technological knowledge. This TPACK Model provides us a more complete understanding of teaching with technology. Content, pedagogy, and technology have to blend to provide a better learning experience for students. It centers on digital pedagogies focused on cooperative learning and realization of desired learning outcomes. The TPACK Model is significant to the paper for it explains the interaction of content, pedagogy, and technology.

Conceptual Framework

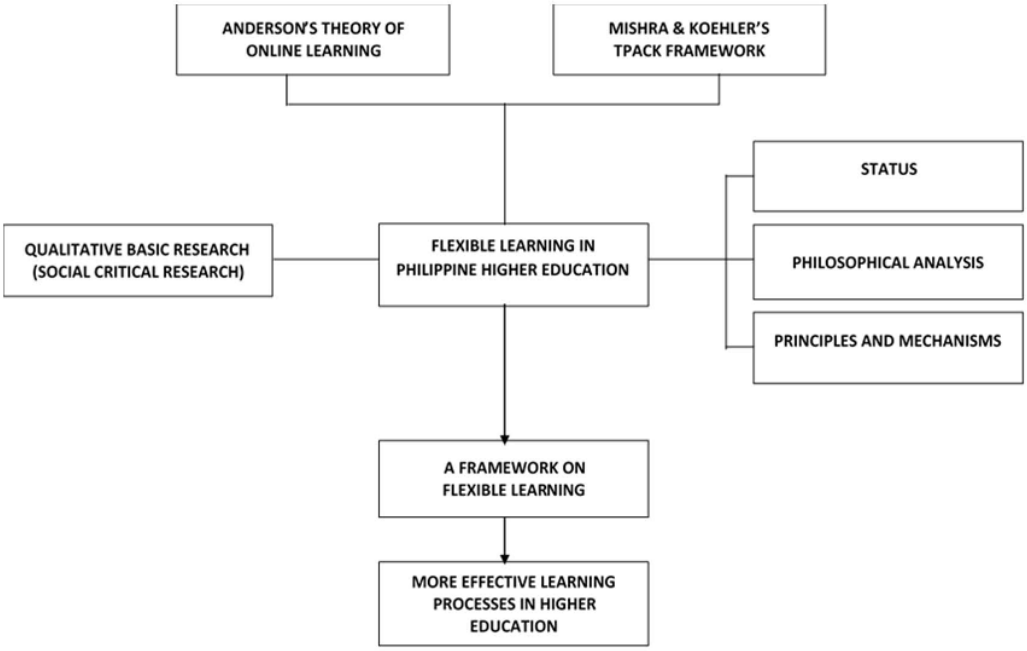

Figure 2: Conceptual Framework Model

The study on flexible learning in Philippine higher education system is anchored on two major relevant theories on contemporary teaching and learning and flexible/online/distance education: Anderson's Theory of Online Learning and Mishra & Koehler's TPACK Framework. It focuses on the determination of the status of such flexible education in the country, subject the status to some philosophical analysis, and articulate principles and mechanisms that would result to a framework on flexible learning for Philippine higher education institutions. This is done through a qualitative basic research using the social critical research approach.

Methods

The study is a basic research. Specifically, it is a qualitative research as observed in philosophy and education. The study employs social critical research strategy as approach to the entire study. The data gathering tools and techniques employed are document analysis and secondary data analysis. It uses qualitative data analysis (QDA) as main tool of analysis. The advocacy lens utilized is educational praxis.

Discussion and Analysis

I. Status

The Philippine education system is greatly challenged by the COVID-19 pandemic. It compromises the entire system that actually totally relies on the face-to-face medium of instruction. Though across countries, face-to-face approach and style is still the most effective modality given principles of

facilitating, coaching, and mentoring in teaching and learning the current situation makes it not efficient. Schools have to find ways to deliver quality instruction given the health crisis. Philippines, as predominantly traditional in pedagogy, has to design educational framework in the time of this educational crisis as a result of COVID-19 pandemic. We need to present the status of our higher education system.

1. Level of Readiness of Philippine Higher Education System

Before the pandemic set in, the Philippine system of education is in the right course. Gradually, our higher education institutions are gaining grounds internationally. A number of our schools have already been part of top schools in Southeast Asia, the whole Asia, and in the world. With the implementation of outcomes-based education coupled with inquiry-based (or problem-based) education, the Philippine curricula indeed prepare the young to be part of the nation's social capital, participate in broad spaces, and immerse in the national/international market economy. The way we articulate competencies composed of knowledge, skills, and behaviors to guarantee quality standards in higher education are remarkable. We have our own differentiation as educational quality given national and international standards.

During the pandemic, the Philippine system of education is heavily challenged. Given a system that is almost totally traditional, where teaching and learning take place in physical classroom setting, the quality of education is compromised. The flexibility required for education given the health crisis is not immediately met. The whole system of education grappled for best forms of educating given health protocols and social distancing requirement. The public system of education fully recourse to modular distance learning. The logistics involved are not clear. The private schools find ways given the pandemic and they employed flexible learning. The way it is done varies from one private school to the next in such a way that this results to quality compromise for quality is not guaranteed. The whole system in effect leads to digital divide and further discrimination in access and quality of education. Guidelines are not immediately prepared. Schools devised ways how to adjust, cope, and adapt given the COVID-19 pandemic. Every school launched its own flagship program for education in the time of the pandemic. Content, pedagogy, and technology are run, reviewed, and revised to suit various contexts. We had difficulty adapting to change given the health crisis since our educational system is OBE-focused but not flexible, creative, and innovative enough for a situation like this. It is still traditional in framework. The alternative system or educational approach/ strategy for a crisis/pandemic situation is not in place. There was a need to review everything: curricula, syllabi, and modules in terms of content, pedagogy, and technology. Various delivery modes of learning system/s have to be incorporated as educational policy mandatory to all higher education institutions.

2. Level of Competence of Philippine Higher Education Institutions

The current curricula, syllabi, and modules for the degree programs are not appropriate for an alternative system in the case of a crisis or pandemic. Infrastructures have to be built in the institutions. The first thing to do is to review the curricula, revise the syllabi, and modify/reconstruct modules. The outcomes-based education framework totally depends on the curriculum. If the curriculum is not fit for a pandemic context, then the quality of education is compromised. One crucial issue here is how do we determine the most essential competencies to be discussed in online learning and how all other competencies are devised and guaranteed in modular learning given the presumption that by blended learning we mean online education and modular learning. The curriculum then speaks of competence of our higher education. Educational quality begins in curriculum, interpreted in the syllabus, and implemented in the modules. The second crucial issue is how content in blended learning is delivered using pedagogical approaches using technology systems and applications. Every curriculum has to show the dynamic interaction of content, pedagogy, and technology in online learning. The kind of quality we create in implementing content, pedagogy, and technology defines the level of competence on higher education. In effect, curricula, syllabi, and modules are designed not only for traditional style of teaching and

learning. Infrastructures should be mandatory to all higher education institutions especially the necessity for information and communication technology.

3. Level of Skills of Higher Education Teachers

Given that Philippine (higher) education is largely traditional in teaching and learning, teachers are not capacitated for technological enrichment to reckon content and pedagogy. In this time of pandemic, education has to be technological. All teachers have to be technologically ready. It seems impossible now in the time of pandemic to teach without technology. Faculty development programs have to give priority to training in the use of educational technology. In higher education institutions, educational technology centers play a significant role in running online learning. Capacity-building programs for teachers to enrich their pedagogical styles and their innovativeness in the use of technology-based applications have to be the primary focus. Creativity and innovation in education are seen in the dynamic interplay of content, pedagogy, and technology.

4. Level of Practicability for Higher Education Students

There are challenges Philippine higher education institutions are facing in this time of pandemic. Learning becomes not workable given reasonable factors: strength of internet connectivity, quality of modules provided, validity of assessment, availability of learning device such as smart phone, availability of budget for net data subscription, conduciveness of respective households for learning, et cetera. There should be modules that are standardized, normativized, and effective that are produced by the government and higher education institutions. Requirements have to be simple, reasonable, and workable given time, resources, and capacity of students. Assessment should not be traditional and objective but should be authentic assessments. Digital divide should never be promoted directly and indirectly. Internet connectivity has to be public. The default system for all degree programs has to be the modules. The synchronous and/or asynchronous sessions should be made available to students but not mandatory; schools and teachers have to effectively monitor the learning progress of every student.

5. Level of Adjustments of Higher Education Stakeholders (Parents, Community, LGU's, PO's)

Parents are not equipped to assist learning of their children who are already tertiary students. The demand for higher budget for studies especially for the requirements is difficult. Uncertainties of the community in the quality of education provided cannot be avoided. The nature of intervention of local government units and people's organizations cannot be undermined and overestimated. There should be new but rationalized guidelines for the fees of the schools, colleges, and universities. Students even in the private schools have to be subsidized by the government. All stakeholders should play respective roles to ensure quality education guaranteeing educational access in this time of pandemic.

II. Challenges

Given the status of Philippine higher education system in the time of COVID-19 pandemic, we have seen the need for re-framing the higher education system, re-formulating national and disciplinal learning outcomes for higher education, re-visiting curricula of programs, re-focusing higher education to educational technology, and re-casting involvement of stakeholders. These are the challenges the Philippine higher education needs to face with urgency.

1. There is a need to re-frame the entire Philippine higher education system
2. There is a need to re-formulate learning outcomes
3. There is a need to re-visit the curricula of all degree programs

4. There is a need to re-focus higher education to educational technology

5. There is a need to re-cast involvement of stakeholders in education

These five challenges identified capture the action the country needs to take on education. They require a collective effort of various stakeholders and demand collaboration from government agencies, non-government organizations, local government units, people's organizations, higher education institutions, schools, parents, and students.

1. The Need for Re-Framing

The Philippine higher education system rests on outcomes-based education as the core principle of teaching and learning in the context of pragmatist-realist framework as its philosophy of education. There is no problem with the framework itself. Even in blended learning, outcomes-based education still could be a viable framework. The need for re-framing actually refers to how outcomes-based education as a framework can be utilized and optimized for blended learning. In the traditional set up, outcomes-based education is applied given the traditional approach. In consideration of synchronous and asynchronous sessions or online and offline learning, educational institutions have to think of ways how to re-apply principles of outcomes-based education. The issue of assessment is one major area of concern in new/alternative modalities. The system has to give more weight or emphasis on authentic assessments and actual demonstration of competencies. In general sense, there is a question of quality assurance in content competencies. Outcomes-based education must guarantee educational quality as applied in online learning modality.

2. The Need for Re-Formulation

The entire Philippine higher education system operates largely and grounded totally on national and program learning outcomes. Since they are articulated given the outcomes-based education in the face-to-face modality of instruction, it is highly possible that they are no longer reliable given the new set up. We need to reformulate and this would mean re-checking and re-evaluating these outcomes, to weigh on reasonable grounds whether the current outcomes are grounded on the educational contexts but at the same time guarantees maximum results. This pandemic forces higher education institutions to streamline the competencies, highlight those that should be prioritized, and from the list is to determine the most essential competencies to be taught to students. Re-formulating the outcomes then would mean identifying national and program learning outcomes that should be delivered to the students. This means we can learn not only the most essential but the whole of competencies which are crucial, by the way, to the 21st century skills.

3. The Need for Re-Visiting

It follows then that after we have reframed the over-all approach to Philippine education and have reformulated the national and program learning outcomes, we have to re-visit all program curricula. By curriculum review and development would mean reviewing curriculum outline, curriculum map, and the syllabi. We need to change the whole curriculum that would fit for blended learning. The current curriculum is a curriculum before the COVID-19 pandemic. The demand for higher education becomes higher because of the challenges by the pandemic. The re-visiting would largely be on the syllabi.

4. The Need for Re-Focus

No doubt, the entire educational system has to shift its style and approach to the utilization of educational technology with all possible infrastructures and applications. This involves, of course, training and re-training of teaching corps in various higher education institutions (especially in public universities and colleges). Schools have to invest. Innovation in the time of this pandemic is a necessity even in and especially for the educational sector. By educational technology would largely mean technological applications that can be used as pedagogical strategies and methodologies. This may

cause a maximal utilization of resources but such can be equated to educational quality bringing forth still excellence in the education system.

5. The Need for Re-Casting

At this point of educational effectiveness in the time of pandemic, all stakeholders in education have to play a more pro-active role in improving the education system along its processes, infrastructures, and procedures. Definitely, the higher education institution, whether public or private, needs strong support with the stakeholders, more than ever. Every stakeholder has to determine its role and share in the education sector. Education is a common good. For higher education, it is a higher good. Without the intervention programs, projects, and activities from the stakeholders, the educational institution, practically, will not survive given the challenges of sustainability this pandemic.

With the five challenges, we need to have principles articulated for a framework suitable and proper for educational sector in the time of COVID-19 pandemic.

III. Principles

A framework on flexible learning is created intended to be a framework that would exemplify strategies to realize completely the efficiency and effectiveness of flexible learning in consideration of the considered contexts of Philippine higher education system, institutions, teachers, students, and stakeholders. It attempts to highlight flexible learning in the Philippine education system as a right response of schools, colleges, and universities in the time of COVID-19 Pandemic. The core conception of the framework is educational praxis. Educational praxis as a model of development education is a philosophy of education. It showcases the status of our higher education and the corresponding challenges it poses to the whole higher education system. It then extrapolates on the measures need to be done: capacity-building of administrators and teachers, content mastery of various faculties, pedagogy-focused educational programming, considered the best practices in different settings, highly effective modules, and technology-enriched syllabi and modules and their implementation. These measures make educational praxis an educational philosophy of action. Such philosophy of action articulates criteriology, efficiency, and normativity in the entire conception and application of flexible learning. There is a need to exemplify some principles for such criteriology, efficiency, and normativity.

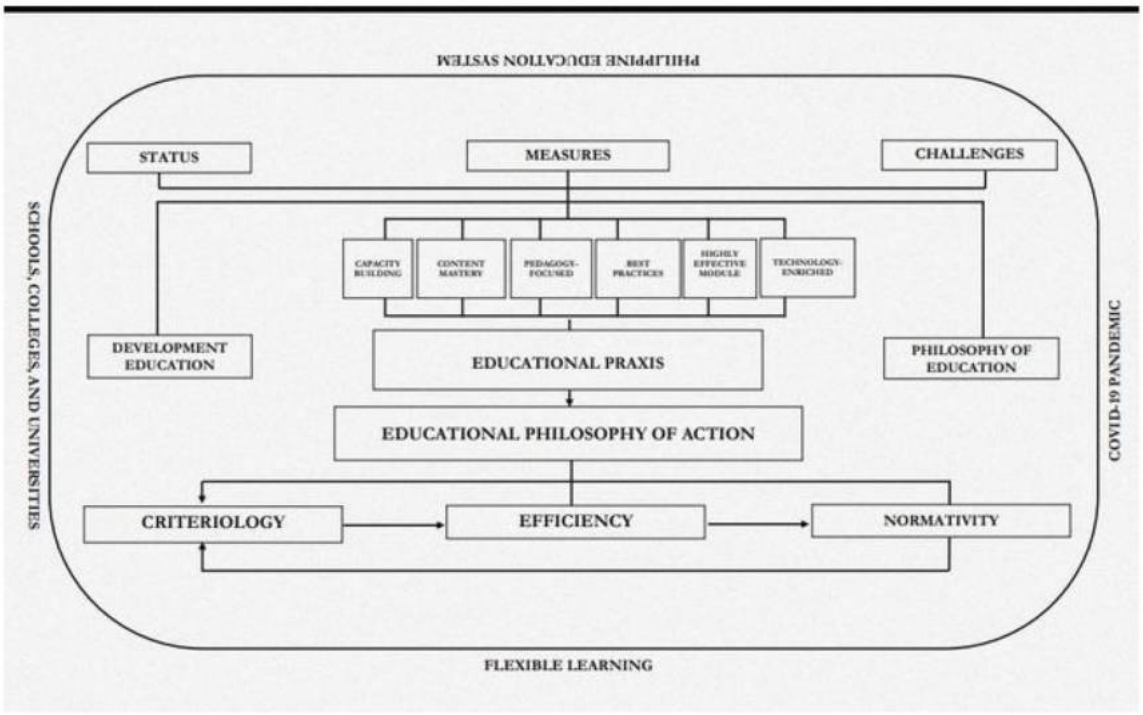

Figure 3: A Framework on Flexible Learning in Philippine Higher Education

1. Educational philosophy of education is community-based and context-relevant.

With the increasing positive cases and mortality rate given the COVID-19 pandemic in different communities (i.e. urban/rural, center-focused/far-flung, upland/lowland) in the entire country, the proper approach to education should not be centralized. The educational approach and strategy given the fact of pandemic has to be community-based and context-relevant. Government regulatory agencies have to study well the prevailing conditions in a given locality and formulate strategy how to implement education in these places. Definitely, there should be a difference between communities where the positive cases are high(er) and communities where the cases are reducing, communities where families are capable of full implementation of online learning and families that can only recourse to modular distance learning, communities where the network broadband services are present and communities where even printed modules are difficult to be produced, institutions with resources and those that do not have, institutions that can push for online learning, blended learning, or purely modular distance learning. These varying set-ups and conditions have to be greatly considered in implementing an educational policy in the time of this pandemic. When such education is community-based, education implemented with all the logistics involved become context-relevant. To implement a centralized strategy in education may result to social injustice and cultural indifference. The various stakeholders of education (government, schools, parents, students, local government units) have to be involved in order to have an education that is truly responsive and the policy made ensures that indeed 'no one is left behind.'

2. Educational philosophy of action is a form of critical pedagogy.

The discussion in Principle 1 is focused on access to relevant education. Principle 2 is centered on the quality of education. This pandemic, however real, should not compromise educational quality. There is only a difference in modality but the competencies remain the same. The proposed framework highlights critical pedagogy. This critical pedagogy bears a perspective that is collective which is based

on consensus and community development. The so-called community-based and context-relevant education fulfills social transformation. Such education responds to the development needs still of the community. This pedagogy has to contribute to community development.

3. Educational philosophy of action is anchored on experiential learning and progressive education.

Experiential learning is the process of finding and creating meaning out of experience i.e. direct experience. It focuses on the learning process of and for the individual. It requires personal values such as self-initiative and self-evaluation. It is about creating an experience where learning can be facilitated. Its dimensions are analysis, initiative, and immersion. Generally, experiential learning is learning through experience. Specifically, it centers on the elements of experiencing, reflecting, and applying. The COVID-19 Pandemic as a communal experience is a great source of experiential learning given the various concepts and principles in various subjects, courses, and programs. Progressive Education rests on the premise that humans are social beings who learn best in real life activities with other people. Education is shared in this sense. The entire educative process of experiencing, sharing, processing, generalizing, and applying primarily occurs within the social context of a given dynamic human interaction. Progressive education emphasizes problem solving and critical thinking, group work and development of social skills, collaborative and cooperative learning, education for social responsibility and democracy, integration of community service in the instruction, and experiential learning. This pandemic is a challenge to have social learning in the midst of social distancing. As a progressive education, it is called to be innovative and creative in having social learning in social distancing.

4. Educational philosophy of action is a measure of quality standards in education.

Quality standards cannot be sacrificed. The pandemic is not an excuse to compromise knowledge and skills. We only have different modalities but the goal remains the same. COVID-19 pandemic does not change the reality that we need graduates that are competitive, skilled, and ready as a social capital to national economy and social progress. The Philippine economy is in crisis. After the pandemic, the best way to recover is to have a good human resource to fuel the economy flow. The values schools should promote for this purpose are relevance, academic atmosphere, institutional management, sustainability, adaptation, and efficiency. Productivity especially of people cannot be sacrificed. We need to have programs that are programmed to the development of communities; that is, re-engineering education delivering and extending education to all.

5. Educational philosophy of action is political.

Education in the challenging times has still to be intended to establish and enhance democratic culture in a liberal democratic constitutional regime. It is fundamentally constructed for the transformation of communities. It is based on political principles of democracy, citizenship, and participation. It sees democracy as the most viable social and political system but tries to challenge that system to improve such system. The transformation can be realized when it is rested on basic rights and liberties, cooperative political virtues, social cooperation and shared responsibility, reflective equilibrium, public reason, public political culture, and objective political dialogue.

Conclusion

Education, development education for that matter, is called to become idealist in principles and dynamisms but at the same time must be realist in considering socio-economic, socio-cultural, and socio-political contexts that we have. Nonetheless, it must not demean being pragmatist for our situation calls for praxis. This redounds to the idea of holistic education. The idea of integrative wholeness in education speaks of considering the various aspects and approaches in education into a unified dynamic

educational system. It is challenged to become constructivist in terms of framing and constituting aims, content, practice, and outcomes in development education. The ultimate guiding principle is that it should be an education that empowers and transforms. Educational philosophy of action in time of COVID-19 pandemic encompasses the impact of development education to community, democracy, and citizenship. It has to be a critical pedagogy towards community development. It has to be anchored on experiential learning and at the time on progressive education. It has to continue to be a measure of quality standards. It has to strengthen continually our sense of democracy.

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The Teaching and Learning Outcomes of Singapore Polytechnic Media, Arts & Design Students from Common Foundation (CFP) Studies

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ABSTRACT

The Media, Arts & Design School in Singapore Polytechnic launched the Diploma in Media, Arts and Design (DMAD) in April 2020 as a single diploma. The pedagogical tools introduced non-GPA computed "Taster" modules and four (4) other core modules which allow students to freely explore various creative disciplines before choosing a specialisation. The use of asynchronous and self-directed learning (SDL) flipped classroom teaching and learning approaches were implemented to help students from different levels of competency learn foundational skills at their own pace. This study was designed to investigate the effect of teaching and learning approaches and demographic differences on their performance when they proceeded to their year 2 studies specialisation that they have chosen. These students were taught four selected taster topics in media, arts and design and 3 core modules by different facilitators with their performance assessed by project submissions at the end of each topic. Two instruments were developed to assess student satisfaction, and sense of effectiveness derived from the foundational studies. The first instrument Students' Participation in Group Discussions (SPGD) was designed for researcher evaluation of student participation in common foundation studies group discussions while the second instrument the Student Self Evaluation (SSE) rating scale was for self-evaluation by students. The conclusions from this study aim to result in a number of recommendations for educators, administrators and institutional practitioners of the common foundation studies. Several suggestions have opened new avenues for future research. These recommendations for pedagogy and suggestions for future research can improve the outcomes of common foundation studies as well as other disciplines in related fields. These could prove to be valuable assessment tools for practitioners of this methodology.

Keywords: Foundation studies, Asynchronous learning, Flipped classroom, Design-led creative approach, Singapore HEI

Introduction

Global learning has changed the way learners are equipping their knowledge and skillset for the 21st century. Based on a previous research carried out in 2021, this new research paper focus on qualitative methods to explore concepts and experiences to unfold the details of students' sentiments towards the effectiveness of Common Foundation Programme (CFP) studies in year 1 after they have proceeded to year 2. Mixed design ANOVA was employed to find out how students start to apply their prior knowledge gained from year 1 to year 2, whether their current style of learning will provide significance in contributing new knowledge to the teaching team when planning for future batches, and to deepen the effectiveness of how future CFP will be designed for learners.

In the 21st century, students will need more than an abstract set of basic skills in reading, writing, and mathematics (Wagner, 2008). The expertise that our learners must master in order to succeed in work and life is critically important for the institution to consider the essential knowledge that our students must equip before they enter the working world.

According to an article of World Economic Forum, Jezard (2018), "the demand for higher cognitive skills such as creativity, critical thinking and decision making, and complex information processing, will grow through 2030 at cumulative double-digit rates".

At Singapore Polytechnic Media, Arts & Design School, year 1 students would engage in many self-directed learning activities, together with asynchronous, synchronous teaching and learning methodologies. It is important to the school to assess how much knowledge has been retained in our students' learning abilities with their first-year exposure to polytechnic learning styles, whether it has allowed students to acquire such self-directed learning attributes to their year 2 and year 3 studies. As different students also possess very different distinctive learning behaviours, it is good to assess how the foundational teaching styles have been beneficial and effective to the learners with the various types of self-directed learning activities prepared by the different modules and subjects.

This study is referenced to Garrison's (1997) SDL model, which associates SDL with 3 elements: (1) personal motivation, (2) self-monitoring, and (3) self-management. With the presence of motivation, the school inculcates and maintains learners' effort toward the self-directed learning style, in order for them to activate cognitive learning goals with outcomes. As for self-monitoring, it refers to the cognitive and learning style which is linked to the process of metacognition where learners have to monitor their own learning style. According to Garrison (1997), learners have to think over the thought process and be responsible when they are constructing their understanding towards the learning outcomes. With feedback gotten from tutors or their own facilitators, self-monitoring will require learners to reflect for improvement, in order to reach another level of knowledge acquisition. As for the 3rd element in self-management, learners are required to take control of their own time, learning materials and support system they would need, in order to impact their learning process. Studies have also shown that SDL impacts learners to take on more personal responsibility to "*be willing to learn" (Garrison, 1997)*, with the ability to direct oneself to succeed in their knowledge acquisition, together with the presence of self-discipline.

Using grading criteria to identify learners' learning outcomes in one's submitted projects in the form of test, reflective journal, personal evaluation sheet and so on, self-directed learning (SDL) has become a critical way of inculcating knowledge acquisition for our learners, especially the youths of today. According to the research conducted by Silén (2000, 2001, 2003), it was also revealed that SDL helps students to *"feel like they are in charge"* and it helps to build their desire to take on more responsibility in their learning. Prior research has also revealed that SDL is a crucial and helpful way to allow

students develop important and essential learning ability, and ultimately, assist students to take on more ownership in their own learning Silen (2008). It is also believed that the deepen understanding of self-assessment and self-directed learning can further enhance the human growth in learning abilities – as it supports the individual's adaptability to learn in self-directed ways in an ever changing VUCA (Volatility, uncertainty, complexity, and ambiguity) society that requires all of us to pick up new skills or knowledge on our own.

The style of SDL done for the students in my current school has been relatively dynamic. However, the deep understanding of how students performed SDL is not known and students would sometimes get feedback that they need more help on how to do a better self-directed learning. Through the focus group discussions (SPGD), we hope to find out more from the students the kind of difficulties or challenges they may face in their foundational studies, whether they have benefited more from the self-directed tasks or on the other hand, see it as redundant or not helpful at all. The different feedback received will also allow the pedagogy team to get a deeper sensing of the holistic learning attributes of the students as they transit from one year to the other with exposure to the various types of self-directed learning activities ranging from self-reading, quizzes, research, self-reflection, self-evaluation forms with rubrics, and surveys.

Literature Review

Students' expectations of the Common Foundation Programme (CFP)

The findings of this study confirm that many of our students have expectations of the academic content and study requirements of the CDP programme that they have been through. This is particularly relevant as they shared their personal expectations and experiences regarding the delivery of lesson, workload, and academic demands of each module that they undertook. In accord with Brown and Edelmann (2000) and Price et al. (2011) the findings demonstrate that accessible and support systems from personal tutors were highly valued by students, despite the many SDL tasks they had to do, be it face-to-face tutorials or asynchronous lessons. We found out that the knowledge imparted to the students is important to be sustainable in education (SE). Hence, the concept of Lev Vygotsky's Zone of Proximal Development (ZPD) (1978) may inspire the effectiveness of learner's behaviours by being able to develop their constructivism as a continuum learning in the three domains of constructed learning include: Endogenous (cognitive construction prompted by previous knowledge), exogenous (external construction influenced by the environment), and dialectical (prompted by interaction between the learner and subject) (Moshman, 1982).

In order to meet the standards of effectiveness, the CFP needs to develop, formalise, and expand the teaching methods for our learners. This is not to be confused with quantitative measures derived from the students, in fact it is also vital to measure the effectiveness with qualitative elements from the results of the students' learning experience. In this finding, students who were involved with the focus group discussion will be able to share more in that aspect.

Measuring the effectiveness of the Common Foundation Programme (CFP)

The Media, Arts & Design School common foundation programme allows students to develop the skills they will need in order to progress into their specialisation studies in our institution. This ranges from general media study skills such as the core modules in Story Crafting (SC), Principles of Design (POD), Understanding Human Communication (UHC) and Playlab (PL). Learners are challenged to juggle with time management and independent acquisition of knowledge in these specific areas.

The DMAD Curriculum Structure

Year 1	Semester1 (Foundry)	**PlayLab**	**3 Core Modules** • *Understanding Human Communication (UHC)* • *Principle of Design (POD)* • *Story Craft (SC)*	Tasters (4 modules)	Institutional Module
	Semester 2	Specialisation		Poly-Wide Elective	Institutional Module
Year 2	Semester 1	MAD White Space	Specialisation	Poly-Wide Elective	Institutional Module
	Semester 2	MAD Studio Project	MAD White Space	Specialisation	
Year 3	Semester 1	Transdisciplinary Project	Final-Year-Project (FYP)	Poly-Wide Elective	
	Semester 2	Internship			

Figure 1: The DMAD Curriculum Structure for 3 years

In the Figure 1 seen above, it illustrates the DMAD curriculum of the 3-year course each learner has to go through when they enroll for this course. It is made up of 3 years, and 6 semesters in total for the completion of the course. The CFP studies take up the first 6 months of the learner's time in their foundation year in polytechnic. Many of the foundation modules are also designed to help learners get a taster of what they may study when they go into their next progression, according to their chosen field of study.

As students are also from different educational backgrounds, the CFP for the year 1 learners will cater for help to some students who have never undertaken any study in the field, while an advanced learner who has more prior knowledge would like to improve and hone their skills more before heading into the next higher-level study.

Conceptual development of our Self-Directed Learners (SDL)

As defined by Knowles, self-directed learning is a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes. Learners would take responsibility and control their own learning process (see Box 1).

SDL activities and processes

Setting own learning goals

Identifying appropriate learning resources

Selecting appropriate learning strategies

Selecting important from unimportant

Integrating material from different sources

Box 1

In recent years, COVID19 has affected the many lives of our learners, from the venues where that they had to learn from and how they were limited from close contact with their fellow learners and tutors, the changes in the way they learn have impacted in the choices that they have made to how they will learn – whereby the PSD is also integrating towards the practice of PSHE. This has caused many of our learners to take on healthy, positive, and conscious choices, decisions, and take responsibility to assume the practice of self-directed learning more and more. We were isolated from one another and had to attend lessons in our own confined living space. When our learners had to acquire knowledge in that style, they started to carry out learning tasks on their own. With that practice, the partnership

between the teacher and the learners, the presence of diligence and being resourceful, have helped both parties to benefit on a large scale, especially on a remote learning style.

According to Todd Gureckis (2012), self-directed learning has been an idea that is widely advocated in education that people are regarded as being able to learn better when the flow of experience is under their control. According to Gureckis, self-directed learning also allows individuals to focus effort on useful information they do not yet possess, exposing the learners to access to information via passive observation, while it enhances the retention of material knowledge in their cognitive side.

Values and choices with self-directed learning (SDL)

As our students are being tasked to engage in self-directed learning, some of the experience can turn out to be about making their own choices regarding how to learn, what to learn and the time needed for them to learn. As they were being guided to make choices and decisions for themselves, it required them to weigh up options and balance out the advantages for different courses of action, which required thinking and considering the processes and outcomes of various learning pathways.

With the need to self-motivate as a self-directed learner. To foster the concept of SDL in our institution does not equal to abandoning our principles and goals as educators, in a misguided act of pedagogic renunciation and populist demagogy. Advocating self-directional learning can be viewed more as a part of a democratic movement that holds people's beliefs of what is important to their learning abilities for striving forward in an everchanging society. This conception is also keeping up with Taylor's (1991) thesis regarding the processes through which moral agents gain greater degrees of control over their lives and live meaningful lives.

Research problem:

In this paper, the research problem focuses on finding out how our year two students see the effectiveness of the CFP teaching and learning outcomes implemented on them in year 1. They were taught three core modules over the span of 6 months. In order to achieve a better understanding of the basic problems faced by these media students, questionnaires were distributed to a total of 230 student respondents. Focus group discussions were performed on 4 groups of year 2 students from 4 different specialisations, one year after they have completed the CFP. The responses projected course-based problems from different core modules, identified as prime reasons by the current and completed student groups relating to their satisfaction towards the CFP studies, and how they feel certain improvements could be made for future runs.

It helps to understand if learners can be assisted to become more independent in their learning and to understand how to perform better during the CFP. The paper also project the gaps faced by students when they advanced to their second year of studies in the HEI, whether they see the relevance to what they have learnt in CFP to be applied further in their year 2 studies. This helps the course planning team to inform teaching team to understand the gaps and to assist future batches of students to perform better in the CFP studies with greater satisfaction.

Statement of the research problem:

Currently, there is not enough information and sentiment analysis gathered regarding how students have been feeling towards the effectiveness of CFP in my school and it would be beneficial to find out more in order to understand the situation better. The research study will focus on finding out how students feel about CFP and if there are ways or recommendations to assist future batches of students to see the relevance of CFP modules being effective. For example, will the action of creating a student focus

group help the teaching team design CFP for the better or will regular dialogue sessions with lecturer in a blended classroom environment allow students to clarify doubts to allow themselves to see the CFP course being an effective one? These are some hypotheses that can be investigated to assist in the research.

Research Question:

The research prompted us to raise questions that are closely related to the possible reasons & sentiments students have when they review the CFP programme, did they have any strategies or attempts to like the modules? As CFP can be interpreted differently by different learners, we expect to collect deep and personal feedback of their own experiences regarding the CFP. It is important to find out how they spend their time in CFP and whether the knowledge imparted is still being practised in their year two studies.

The following research questions are asked:

RQ1: How do year 2 students perceive the foundry programme in terms of enjoyment, relevancy, e-learning, and workload?

RQ2: How do students from different specialisations differ in their perceptions of the foundry programme?

RQ3: How do poly students see the effectiveness of self-directed skills gathered from CFP as being useful in their year two studies?

Key terms:

students	*self-directedness*	*learn*	*methods*
learners	motivation	self-regulated	focus group
poly student	self-management	ownership	individual
adult student	self-monitoring	performance	survey
PET	self-study	grade	questionnaire
Year 1	ownership	efficacy	interviews

The key terms are:

- How students they feel towards CFP as a whole
- Teaching & Learning effectiveness for students who undertake CFP modules
- Students' views about self-directed learning (SDL) in their CFP

Method:

Research Design and Materials

A qualitative survey study was conducted from 20 June - 4 July 2022 when students were in Year 2 of their 3-year Diploma programme. At this point, the students had completed the foundry programme, had joined their chosen specialisations, and had taken 1 semester of specialisation modules. Conducting this survey with the Year 2s allowed us to draw on students' deeper knowledge of their chosen creative specialisation when evaluating the foundation programme.

To answer the research question, five statements ("the module is enjoyable", "the module is useful to my preferred specialisation", "the module is relevant to my preferred specialisation", "the module's e-learning is of high quality", and "the module's workload is manageable") were asked of each of the 4 foundry modules. Students rated their level of agreement to the statements on a 6-point Likert scale (1-strongly disagree; 6-strongly agree). Dimensions that received the lowest scores were flagged as these were the areas that are most in need of improvement.

In addition, 4 focus group discussions were conducted with 18 students from 4 specialisations (SCC, DCX, MPD and ADP). The discussions were conducted on 14 July 2022 and each session lasted between 60 and 75 minutes. The qualitative feedback helped to supplement the quantitative survey results.

Respondents:

230 students completed the survey. Table 1 shows the student profiles in terms of their chosen specialisations and the response rates. The overall response rate was 57.2% and most specialisations were well represented in the survey with response rate above 50%. The exception was the Motion Design & Effects (MFX) specialisation which received a low response rate (35.1%).

Table 1: Students' preferred or chosen specialisations

	No. of survey respondents	Total no. of students in the specialisation	Response rate (%)
Design for Communication Experience (DCX)	44	82	52.4 %
Integrated Marketing Communication (IMC)	37	64	57.8 %
Animation & Game Art	37	55	67.3 %
Music Production (MPD)	33	58	56.9 %
Story & Content Creation (SCC)	27	41	65.9 %
Applied Drama & Psychology (ADP)	23	35	65.7 %
Game Design & Development (GDD)	17	30	56.7 %
Motion Design & Effects (MFX)	13	37	35.1 %
Total	**231**	**402**	**57.2 %**

RQ1: How do year 2 students perceive the foundry programme in terms of enjoyment, relevancy, e-learning, and workload?

Table 2 shows the perceptions of the foundry modules on the four areas of enjoyment, relevance, eLearning and workload.

Table 2: Students' perceptions of the foundry modules (average scores)

	PlayLab (PL)	StoryCraft (SC)	Understanding Humans & Communities (UHC)	Principles of Design (POD)
The module was enjoyable	4.46	4.90	4.65	5.01
The module was useful to my chosen specialisation	3.83	4.55	4.13	4.67
The module was relevant to my chosen specialisation	3.92	4.50	4.11	4.65
The e-learning materials were of high quality	4.68	4.92	4.97	5.03
The workload was manageable	4.29	4.83	4.94	4.94

Note. Respondents indicated their level of agreement to the statements on a 6-point scales (1=strongly disagree; 6=strongly agree) with higher scores indicating a more positive perception of the module.

Overall, the foundry modules received somewhat positive responses from the year 2 students, with average scores ranging from 3.83 to 5.03 on a 6-point scale (i.e., close to "slightly agree" and "agree").

Of the four foundry modules, Principles of Design (POD) received the highest scores of between 4.65 and 5.01 on a 6-point scale (i.e., an average score of between "slightly agree" and "agree"). In particular, students found the module enjoyable (M = 5.01) and that the e-learning materials were of high quality (M = 5.03).

While the foundry modules received somewhat positive responses overall, the dimensions of usefulness received the lowest scores for all modules. Notably, PlayLab's (PL) usefulness was somewhat low (M = 3.83 and M = 3.92 respectively). As students' perception of usefulness is dependent on their chosen specialisation, further inter-specialisation analysis was conducted to get a better understanding of the areas that can be improved.

RQ2: How do students from different specialisations differ in their perceptions of the foundry programme?

Table 3 highlights the perceptions of usefulness of the foundry modules among students from different specialisations.

Table 3: Students' perceptions of the **usefulness** of the foundry modules (by specialisation)

	PlayLab (PL)	StoryCraft (SC)	Understanding Humans & Communities (UHC)	Principles of Design (POD)
Animation & Game Art (AGA)	3.49	4.89	3.65	5.00
Applied Drama & Psychology (ADP)	3.39	5.09	5.52	2.87
Design for Communication & Experience (DCX)	4.84	3.84	4.28	5.48
Game Design & Development (GDD)	3.76	4.94	4.35	4.59
Integrated Marketing Communications (IMC)	4.03	4.32	4.27	5.14
Motion Design & Effects (MFX)	3.92	3.77	3.08	5.08
Music Production (MPD)	3.24	4.00	3.64	3.33
Story & Content Creation (SCC)	3.48	5.89	4.11	5.26

As expected, students from the specialisations that are most closely linked to the specific foundry module rated that module most favourably. For example, Principles of Design (POD) fared well among students from Design for Communication & Experience (DCX) students ($M = 5.48$) and the Integrated Marketing Communications (IMC) students ($M = 5.14$). Likewise, Understanding Humans & Communities (UHC) fared well among students from the Applied Drama & Psychology (ADP) specialisation ($M = 5.52$) and Storycraft (SC) fared well among Story & Content Creation (SCC) students ($M = 5.89$).

Surprisingly, Playlab (PL), which uses a design-led creative approach, did not do as well as expected among the DCX and IMC students (4.84 and 4.03 respectively). This is surprising as these students apply a design pedagogy in their specialisations but yet saw less usefulness in the skills taught in PL.

For most specialisations except for the Music Production (MPD) specialisation, the average score was at least 5.00 ("agree") for one of the four modules, indicating that they found at least one module useful to their specialisation. The specialisation which rated the modules the lowest was also MPD, indicating that for students of this specialisation, the usefulness of any of the foundry modules was the least. This is a gap that should be looked at for future runs of the programme.

RQ3: How do poly students see the effectiveness of self-directed skills gathered from CFP as being useful in their year two studies?

From the Table 4 below, it highlights the sentiments and perceptions of how students see the effectiveness of self-directed skills gathered from CFP as being useful in their year two studies. These were conducted over four focus group discussions, together with 18 students from year 2.

Table 4: Comments about SDL
"I enjoyed SDL, I could rest and sleep more at home" *"SDL allowed me to be more disciplined"* *"I like SDL, I can go to class more prepared and ready to answer any questions my lecturer will ask"* *"I am very used to SDL now, I still use it in year 2".* *"I am not very motivated with SDL, sometimes I do not know what I need to do."* *"SDL was okay, I could spend more time learning whenever, wherever."* *"I like SDL because I can always refer back to the video tutorials if I need to refresh my memories."* *"SDL makes me more independent."* *"SDL is applicable to adult life.* *"I am able to learn well with SDL"* *"I am very used to SDL because I used to do that in my secondary school"* *"I dislike SDL, I prefer to learn with other people around me."* *"I need to be more self-disciplined when it comes to SDL learning, I can get distracted."*

Results & Discussion

From the study of the 230 respondents, 22 students were very satisfied with the CFP, 142 students were satisfied, 50 students were slightly satisfied, 10 were slightly dissatisfied, 4 were dissatisfied and 2 were very dissatisfied.

The four CFP core modules which our students took have achieved the below results in terms of being relevant in their year 2 studies.

Module Relevancy in year 2 study	Strongly Agree	Agree	Slightly Agree	Slightly Disagree	Disagree	Strongly Disagree
PlayLab (PL)	29	59	62	38	27	15
StoryCraft (SC)	57	75	55	19	14	9
Understanding Humans & Communities (UHC)	35	57	75	33	20	10
Principles of Design (POD)	84	66	35	13	23	9

Based on the results and written feedback for survey, majority has strong agreement to the relevancy of POD. However, PL received the most disagreement to the relevancy to their year 2 studies. PL also received the most written responses (215) as compared to other modules, citing for improvements and suggestions to the module to be better.

Of the 18 students interviewed from the focus group discussions, most students are in favour of learning from the SDL style of acquiring knowledge. Many of them see values in becoming more independent with a stronger self-management style. They mentioned materials for SDL need to be engaging and a preferred "bite-sized knowledge" material should not be replaced by a large amount of reading materials.

Students also gave feedback that every SDL task should be scaffolded by the expert or lecturers' feedback. Vygotsky (1978) emphasized the role of "*reciprocal interaction with an expert*", such as guiding, modelling, and discussion. Hodson & Hodson (1998) also emphasized about the timing of

feedback given is important to motivate the learner to derive and construct more new meanings (Pressley, Harris, & Marks, 1992).

The use of proper scaffolding is essential to our learners, especially for our first year students who are new to the new teaching & learning methodology – they need to learn the new concept and tasks that could be challenging to their personal interests and knowledge level. Proper scaffolding helps to ensure relevant learning experiences for the learner to validate their learning. Over time, the scaffolding can be gradually withdrawn as our students learn to become more self-directed and responsible for his or her own knowledge construction with autonomy.

The findings and discussion indicate several implications for future practice with the need for:

• More consistency in practice regarding the relevancy design of core modules to learners

• Clear criteria and selection to identify suitable educators for the modules to be interesting and relevant to learners, including the evaluation of Student Feedback (SFB) scale as a predictive tool

Conclusion

The results of this study on the CFP suggests that a more integrated approach to designing the curriculum for the foundation core modules is necessary to achieve a better satisfaction that caters to different students interested in different fields of study. As the CFP is also running as the first time, a tighter consideration in the core modules should also allow customisation to allow deeper relevancy and validity for the students, in order to allow the CFP to be effective for more batches of student in the future.

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The Human Capital Empowerment of Lao Krang Ethnic in Suphanburi Province for Cultural Tourism

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ABSTRACT

This research aims to 1) analyze the needs and knowledge of cultural tourism in the Lao Krang Community in Suphanburi Province, 2) develop the human capital potential in the Lao Krang Community on cultural tourism management by using local wisdom as a tourism and hospitality driving force and 3) suggest tourism activities by the community through the Lao Krang culture per the nature of local tourism resources and services. The critical informants of this study were government agency representatives, tourism and hospitality professionals in the private sector, Thai citizens or tourists, and the local people in the Lao Krang Community. The research method uses in-depth interviews with 12 different stakeholders. The results showed that 1) there are the needs of the community in Rai Lak Thong Sub-District toward the activity creation and training courses related to cultural tourism and other services, which will help to strengthen the human capital to be able to compete both at the national and world levels; 2) the engagement of the local people in the community and the academics of the university, the leadership, and the awareness building are driving forces of human capital development to promote cultural tourism of Lao Krang in Suphanburi Province and 3) there are needs of human capital development strategies and plans that are compatible to the Lao Krang Community and suited to different local groups including labor forces and businesses, local people of working ages, youth and elderly people which the university academic staff could support

Keywords: Human capital empowerment, Cultural tourism, Lao Krang ethnic, Suphanburi province

Introduction

The Thailand 4.0 approach refers to the change system as containing four components (1) change traditional farming to modern agriculture that focuses on management and technology or smart farming as a method for farmers to increase income and become entrepreneurs; (2) change from traditional SMEs to be intelligent enterprises and startups with high potential and innovation-driven enterprises (IDE); (3) change from traditional services, which has a relatively low-value creation to high-value services; and (4) change from low-skilled labor to knowledgeable with high skilled labor expertise. An important issue is human capital development which allows the majority of people to participate equally and focuses on inclusive growth that aims to create income distribution, equal opportunity, and wealth. It is crucial for economic development in the community and social enterprise at the foundation level. This approach promotes and creates an environment conducive to doing business that supports and encourages small and medium enterprises to be strong and competitive. It is necessary to develop a skilled and technologically literate workforce and support capacity enhancement, building skills, and fulfilling people's potential to achieve the earlier changes that involve creating local participation at the national level.

Suphanburi Province has the potential for development, especially from a cultural capital perspective, due to the various ethnic groups living in Suphanburi Province. Lao Krang is an ethnic group living in Suphanburi Province. Historical evidence found that the Lao Krang ancestors had migrated from Vientiane and Luang Prabang, along with other groups of Laotian people. Lao Krang is the name of a language and a group of Laotians living in Central Thailand, such as Nakorn Pathom, Chainat, Uthai Thani, and Suphanburi provinces.

Lao Krang is often referred to as "Lao Khe Krang" or "Lao Krang" the meaning of the word "Lao Krang" is not precisely known. However, some assume it is derived from the word "Phu Khang", the name of a mountain resembling a bell on the northeast side of Luang Prabang in the Lao People's Democratic Republic, where Lao Krang people originated.

The distinctive cultural artifact is the Lao Krang Cloth, which is woven for use in daily life and for performing various rituals. There is also a culture of language, food, traditions, and beliefs.

The community situational review found that the community requires research and innovation to enhance cultural tourism, especially in "Human Capital Development," to support the cultural conservation of the community. There is still the need for personnel development with knowledge and skills to support the cultural tourism of the community. The local identity and culture can create value for cultural tourism of Lao Krang in Suphanburi Province.

Research objectives

1. To analyze the cultural tourism needs and knowledge of Lao Krang Community in Suphanburi Province.
2. To develop the human capital potential in the Lao Krang Community on cultural tourism management by using local wisdom as a tourism and hospitality driving force.

3. To suggest tourism activities by the community through the Lao Krang culture per the nature of local tourism resources and services.

Research Methodology

The research used the PRA (Participatory Rural Appraisal), and participatory community analysis with RRA (Rapid Rural Appraisal) approaches. RRA is a kind of quantitative research (Chai Potisata, 2019) in order to get the participation from the local also to conserve and build the potential of the community. The research method was systematically learning space conditions in a short time using multiple tools, mainly primary and secondary data, that emphasized the exchange of knowledge and experience between the research team and people within the area.

Methodology

The research consisted of an integrated approach with the following research steps.

Step 1: Study relevant documents and context for course development

The course development aligns with the new ordinary tourism, cultural tourism, and the participation of the local community, which is the aim of cultural and sustainable tourism in the community.

The researchers studied the secondary sources from many types of documents such as textbooks and9 related research for (1) the knowledge of cultural tourism for the community, (2) the local wisdom knowledge, and (3) the concept of community participation.

Step 2: Training course development

The data were collected from questionnaires, interviews, and focus group discussions. The course development contained the following issues:

- The course composition consisted of the objectives of the training course, subjects, and content or training guidelines—the technique or methods of training, duration, and activities. The lecturers or trainers who conducted the training courses enable the participants to learn step by step and may allow trainees to perform the assigned tasks more efficiently and willingly.
- The training courses organizing on cultural tourism for the interested people in the community, as well as government and private sectors who can adapt and adopt the result of the research to benefit other communities.

Research Tool

The research included questionnaires, in-depth interviews, and focus groups for collecting data with audio recording, photographs, and observations are detailed as follows:

1. They were administrating questionnaires from the tourists who visited Suphanburi Province or knew the ethnic group of Suphanburi Province.
2. They provided in-depth interviews with the government sectors, the private sectors, and the people related to tourism in the community.
3. Focus group discussions with the related sectors or people such as the government sector, the private sector, and the people in the community related to tourism in the community.

Main findings

The of field visits observation study and in- depth interviews, as well as the study from various documents, the results of each research objective, are as follow:

Objective 1. To analyze the needs and knowledge of cultural tourism of Lao Krang Community in Suphanburi Province.

The personnel development for tourism in the community was what the local people in the community most needed. The community wants to create jobs and generate additional income. The community also wants to share the community's local wisdom, history, and pride with the public. Personnel development needs included t presentation skills because it is essential for tourism. Personnel development should be assisted and supported by educational or academic institutions.

The majority of people in the community are farmers. Hence, they lack knowledge in management, marketing, and communication. Therefore, human resources development must be easy for them to learn and practice. Moreover, the local people lack tourism knowledge, so strengthening and effective development approaches to promote cultural community tourism is a must. Therefore, the workforce development should help to enhance skills and knowledge in cultural tourism and services based on cultural resources of the local area to become known to more tourists as the following:

1. Cultural Tourism Management
2. Tour Guiding/Storytelling
3. Product design
4. Online Marketing/Digital Communication
5. Hospitality and services
6. Lao Krang cultural information

Objective 2 To develop the human capital potential in the Lao Krang Community on cultural tourism management by using local wisdom as a tourism and hospitality driving force.

To enhance the value of human resources to strengthen the development of the human capital of Lao Krang, cultural tourism management in Nong Ya Sai District should be done by adding value through training. It is necessary to build the confidence of the local people by demonstrating the human resources. The quality of such service is essential to workforce development. The practice or training is most suitable for personnel development, consistent with the research of Suwanphimol et al. (2006), who found that the government organizations preferred training methods in the form of lectures and group discussions. Local personnel needs for the development of cultural tourism for the Lao Krang Community consists of 3 components: A-Activities, L-Local Community, LC-Lifestyle, and Culture.

Objective 3 To suggest tourism activities by the community through the Lao Krang culture per the nature of local tourism resources and services.

The local cultural context within the area is the main factor leading to human capital development in promoting cultural tourism. This context can be analyzed and synthesized to create human capital development driving forces. Promoting cultural tourism must have a clear policy in the implementation of development. The determining key is that the hosting units should drive strategy and coordinate with the agencies in the network to participate in the development of the community, including creating a timeframe to ensure continuity and coverage. The concept of Human Capital Development should not

be limited to business and human capital. Still, it should be in every group, including the locals, seniors, and youth forces (Machu and Morasilp, 2017). This development will aid in the community gaining more tourism preparedness to welcome and manage tourism for sustainable efficiency (as shown in Table 1).

Table 1: Drafting Guidelines for Human Capital Development through Lao Krang Culture Nong Ya Sai District, Suphanburi Province

Period	Guideline	Group
Short-term to Medium-term (1-5 years)	**Training in supplementary tourism-related occupations** such as design development or product design and digital media **Human capital training on issues of urgent development** needs such as storytelling skills, tour guides, and hospitality and services	Locals Seniors Youth forces
Long-term (5 years up)	**Suitable tourism courses according to the needs of the local area in the future**	Locals Seniors Youth forces

Conclusion and Discussion

There is the need for participation and cooperation of all sectors by having continuity of planning through integration between various agencies involved in tourism promotion and human capital development, such as educational institutions, local administrative organizations, and provincial tourism development office. The awareness of growth in tourism among all groups of people in the local community, especially youth groups, in developing skills in various fields for cultural tourism in the area and creating a sense of unity among people within the local society is crucial to human capital development. It is a significant factor affecting the success of human capital development in Lao Krang cultural tourism planning and development.

In conclusion, the community's survival depends on the participation of all parties involved, whether the community or government and private agencies contributing to the successful transfer of wisdom from the past, present, and subsequent generations.

Therefore, there must be a way to influence the new generation to realize the importance of community identity and transfer the knowledge to the younger generation to inherit the local wisdom by combining technology and expertise. This approach strengthens the ability and conserves Lao Krang culture of Nong Ya Sai District within the new era for continuous development and enhancement.

In summary, the critical success of human capital development for cultural tourism is the participation of the partners or networks between government sectors, academic institutions, and communities. The policy promotes and develops human capital by having suitable courses that meet the community's needs to develop seriously and produce tangible results. Furthermore, the educational or academic institutions may apply the methods to provide the local community with knowledge and skills for sustainable development in the future.

Recommendations

1. Further studies are needed to evaluate the success of training and knowledge management.
2. It recommends a further study on the linkage of tourism in the neighboring areas to create a tourism network with community participation.

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A sustainable human capital process of Rajamangala University of Technology in Thailand

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ABSTRACT

One component of Thailand's 12th Economic and Societal Development plan is to implement sufficiency economy philosophy suggested by the late His Majesty King Bhumibhol of Thailand. The philosophy supports a holistic development in all dimensions based on sufficiency, reasonableness, and immunity of the people and community. These three concepts should be considered with knowledge and moral conditions. Rajamangala University of Technology has adopted the philosophy in the administration of the university. This research aims at developing a human capital development model for Rajamangala University in Thailand. Delphi research technique was utilized. Eighteen experts in the human capital development field were recruited from Rajamangala University and other universities. Data were gathered from these experts. Items were extracted from the interviews. These items were submitted to the experts for review twice. Eventually, the remaining items were compiled into a human capital development model consisting of human development planning, recruitment, training and development, and retention of personnel based on sufficiency economy philosophy.

Keywords: Human Capital, Rajamangala University of Technology, Human Capital Development, Sufficiency Economy Philosophy, Delphi technique

Introduction

Rajamangala University (2020)'s history explained that the university was established from the consolidation of various technical vocational schools in 1975. Formerly, these vocational schools could offer only certificates and diplomas to students. The advancement to bachelor education was difficult for students because they emphasized in practicing technical skills and agriculture but had little education in general basic subjects such as Thai, English, Geography, among others. They were handicapped to students who took general education in normal schools and could hardly compete with those students in the national entrance exam to further their studies. In 1975, the government consolidated 30 technical vocational schools and restructured them to offer bachelor degree in teaching vocational programs, research in vocational areas, and community services and named the institution Technology and Vocational College. In 1988, the college was upgraded to be Rajamangala Institute of Technology. The institute was further expanded to become Rajamangala University of Technology in 2005. Nowadays the university had nine campuses around Thailand offering bachelor and graduate degrees in various fields of study in addition to the vocational certificates as in the beginning. These campuses operate independently under the same Rajamangala University of Technology Royal Act 2005. The university reported the number of 129,310 students in the first semester of 2021, nearly 10% of total numbers of students in higher education system in Thailand of 1,383,421 students (Office of the Ministry of Higher Education, Science, Research and Innovation, 2021).

There has never been a study which consolidated the human capital development (HRD) policies of Rajamangala University of Technology before. The various vocational schools had different HRD policies and practices. Now that they are under the same umbrella, the maintenance of the same standards among the campuses are necessary. The researchers aimed primarily at examining and creating the consolidated human capital process and development model of Rajamangala University of Technology in Thailand. Moreover, sufficiency theory was used as the basis in the development of the human capital process according to the National Economic and Social Development Plan. Hence, the main research objective focused on formulating a formal sufficiency economy-based model to manage human capital applicable in academic institutes. This research examined the concepts of human capital development, adult learning theory, and sufficiency economy philosophy, and integrated them with related past studies to formulate the elements of human capital development model of Rajamangala University of Technology in Thailand. The final model originated from this research may be extended for further use as a guideline for the universities in both the provincial and national levels to develop their own human resources. The conducive organizational culture will henceforth follow, together with the promotion of work ethics and mutual exchange of knowledge, with an ultimate goal of generating human quality, satisfactory service providing, and national development.

Literature Review

Harrison and Kessels (2004) indicated that human capital development is a process in the organization and consists of planning and skillful supports to hold formal and informal learning, including the system for knowledge creation and experience sharing in and outside workplace. These elements would ultimately lead to the origination's growth and personnel's elevating potentials via competency development, adaptation, and teamwork.

Grieves (2003) mentioned three elements of strategic human capital development (HRD) as consisting of awareness of complexity of change management, need to survive, and refocusing from training to

securing new ideas and approaches to develop human resources for the upcoming century. Yorks (2005) explained that human resource development is a summated thinking to incorporate roles and actions of related parties to generate work efficiency, while enabling the personnel and the organization to complete their missions.

Psychological theory, economic theory, and systems theory are the three basic theories of human resource development, to be symbolized as three legs on the bench of ethics. Hence, these three areas function in an integrated manner as the major elements of human resource development theory, on which the human resource development theories are built (Swanson & Holton, 2009).

Gilley, Eggland, and Maycunich (2002, p. 96) stated that human resource development is a process for learning, performance elevation, and human change. The achievement was possible through the formal and informal creative and management activities. Hence, work efficiency, human potentials, preparedness for change, and self- adaptation would definitely ensue.

Werner and DeSimone (2006, pp. 15-16) stated four levels of human resource development as follows:

1. Individual Development focused on personal and short-term tasks, by developing an individual worker's knowledge, skills, and adjusting working behavior, so that they can do their job effectively. The most frequently utilized tool in this stage is classroom and non-classroom training. This development stage would be initiated form mutual agreement between superior and subordinate, under which an individual development plan (IDP) would be established.

2. Career development also focused on individual development but aimed instead for long-term outcome. In this stage, individual needs would be analyzed based on personal interest, values, and ability, and the acquired data would be used to determine a development plan to increase a personnel's knowledge and skills for efficient working in the future. The activities involved in this stage are career path planning, talent management, and succession planning.

3. Performance development focused on the holistic and short-term goal of the organization, aiming particularly to increase organization's performance by ensuring that the personnel would be provided with knowledge, motivation, and task-conducive environments. In other words, this development stage basically aimed at the personnel to create their performance to meet year plan, and hence leading to the organizational achievement. The activities involved in this stage are: job indicator management, job monitoring and feedback providing, performance evaluation, and providing rewards and development opportunities.

4. Organization development focused on the holistic and long-term development of the organization, involving its problem-solving ability, improving or setting its structural system, creating organization culture, and generating leadership in the organization.

Moreover, Delahaye (2005) proposed the wider theoretical context of human resource development as consisting of: the creation of knowledge using the SECI Model of knowledge management, the new management theories to prepare for uncertainty or crisis, diversity management to gather talents of individual personnel for ultimate benefits, and the functions of human resource management to incorporate human resource development, strategic planning, and performance evaluation.

Regarding the sufficiency economic theory, Thailand's 12th National Economic and Social Plan has incorporated the sufficiency economy philosophy as in the previous 9th plan so that the well-rounded

development was initiated on the basis of sufficiency, reasonableness, and immunity toward uncertainty and risk management which could be implemented through careful consideration with knowledge and morality. The said approach is expected to lead Thai society to sustainability, in which Thai people would develop themselves to be a quality and happy-living human being. A principle of the 12th plan is to focus upon "human-centered' approach in which a good life and health quality are promoted to build a "complete" person, equipped fully with self-discipline, knowledge, skills, creativity, positive attitude, social responsibility, morality, and knowledge-oriented curiosity. The ultimate goal of this principle is for Thai people to advance to a quality senior life, and live harmoniously with fruitful natural capital and environments (Office of the National Economic and Social Development Council [NESDC]. (2017).

According to Nadler (1980), three elements of human resource development that consist of training, education, and development would lead to individual development, career development, performance development, and organization development. This research, therefore, used Nadler (1980)'s concept of human resource development to be the framework of this study, consisting of four aspects of human resource development: planning, recruitment, training and development, and retention in four levels of Werners and DeSimone (2006). This framework also incorporated the sufficiency economy philosophy of sufficiency, reasonableness, immunity, knowledge, and morality.

Methodology

The key informants participating in the Delphi procedure consisted of 18 persons who held a doctoral degree or an academic rank of assistant professor or above, with the experience of teaching or working in human capital management, human capital development, or being an organization leader in the management level. Besides being willing to participate in this research, the key respondents also have to produce academic works relating to sufficiency economy philosophy, human capital management or human capital development, or be renowned in applying the sufficiency economy philosophy in their work or development activities.

The Delphi technique was conducted in three rounds with 18 experts as of the following details: The first round was conducted by interviewing 18 experts using semi-structure open-ended questions to guarantee free flow of opinion presentation. The questions asked about human capital process and development based on the framework specified by Nadler (1980), i.e., planning, recruitment, training and development, and retention of personnel with the incorporation of sufficiency economy theory. Data were was content-analyzed and compiled into items. These items were tested for validity using the Index of Item-Objective Congruence (IOC) by another five experts. The items with scores higher than the criteria of 0.50 were retained, and the overall IOC index of the first-round open-ended questions was between 0.67-1.00. The five experts agreed upon the retained items. The items retained were used to create a scale.

The second round surveyed opinions from the 18 experts recruited using the scale developed from the retained items acquired in the first round. This round aimed at the experts to weight the importance of each item relating to the human capital management process based on the sufficiency economy philosophy. The scores ranged from 1 = highly disagreed to the item to 5 = highly agreed with the item. Once the scales were returned, scores of median and interquartile ranges were calculated for each item to show the relevance of each item to the human capital development of Rajamangala University as ranked by each expert. The IOC of each item from the second-round

questionnaire was also tested. Only the items receiving the median score higher than 3.50 or the interquartile scores of 1.50 were retained.

The third round employed the same questionnaire as used in the second round. In this round the same scale was used but the medians of each item were included in the scale. The researcher sent the questionnaire marked with medians and each expert's previous responses in the second round back to him/her to confirm or revise their responses. The experts were asked to review whether they insist on their opinions regarding each item or they would want to revise their scores considering the opinions of the majority reflected from the medians of each item. Eventually, the researchers arranged the items that were ranked as the most and very important and received consensus among the 18 experts to formulate the human capital process of Rajamangala University in Bangkok, Thailand. As for the third round of Delphi technique, the items with median scores of 3.50-4.50 signified the high importance level while those higher than 4.50 signified the highest importance. Similarly, the interquartile range score of lower than 1.50 signified the consensus among the experts.

Results

The experts commented that the human capitals interventions in each unit should be set in accordance with the university's criteria and measures, as well as the context of each work unit. In this case, the personnel's needs should be taken into consideration, with the final goal of their self-development. Hence, the policy should be formulated to heighten their knowledge and ability to increase work efficiency and effectiveness.

The data to be used in formulating the said policy should be derived from past performance evaluation of each work unit, in which strengths and improvement-needed issues should be prioritized based on the evaluation. As a result, the personnel would be developed as per their needs, knowledge, and responsibility. The individual-based plans would be incorporated to formulate the annual human capital development plan and policy of the university.

Regarding the personnel development activities, they may include promoting them to acquire higher education degree and/or academic ranks and titles, and heighten job-related skills and expertise development via personal training. The lecturers would also be encouraged to produce scholarly works and publications through available supportive research funds.

The principles to handle human capital development in the organization should focus on efficiency and effectiveness on the basis of job-related individual knowledge and ability. Budgets and activities should also be assigned to fulfill the goal set for human capital development.

The human capital process based on the sufficiency economy philosophy for Rajamangala University was generated from interviewing 18 experts in the first round and revised in the second and third rounds. It comprised 5 dimensions:

1) Sufficiency. This includes items relevant to worthiness usage of resources in the annual planning; implementation of activities at minimum costs; goal-driven resources usage; policy-conforming managing and implementing, and budget allocation.

2) Reasonableness. The universities applied reasonableness principles in teaching, learning, administrating, self-developing, proper determining of individual job, analytical skill updating, and

performance evaluating. The causes and effects or results of all activities in the universities should be reviewed and analyzed

3) Immunity. Personnel should be enforced via job-related and self-evaluation, risk assessment plan, efficient learning and work operation, self-preparedness for future changes and inevitable impacts, fruitful organization culture and values in terms of self-reliance & self-development, mutual interaction with nearby communities, career path planning, and back-up plan to buffer unexpected environmental impacts.

4) Knowledge. In order to perform support activities following sufficiency, reasonableness, and immunity dimensions, personnel should be equipped with knowledge to evaluate whether their actions complied to these dimensions. Personnel should be promoted via scholarship, research funds, efficient knowledge management, training & seminar, risk management training, knowledge-transmitting publications, support for creativity, knowledge application & self-development, and living a sufficiency life.

5) Morality. This dimension together with knowledge should be the basis to determine the above three dimensions. This can be applied in working, performance evaluation and compensation, transparent operations, ethical values, mutual relationship and support, and moral-promoted activities.

The retained items were categorized to reflect the human capital process of Rajamangala University. The obtained process consisted of 4 dimensions of planning, selection, training, and retention, in which the five concepts of sufficiency economy philosophy (sufficiency, reasons, immunity, knowledge, and morality) were incorporated. The process is presented in Figure 1.

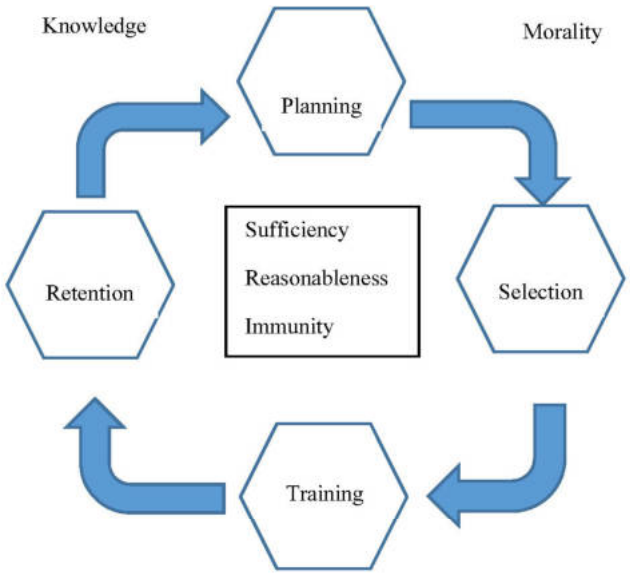

Figure 1: Rajamanagala University of Technology human capital process incorporating the sufficiency economy theory

Discussion

The research findings confirmed that the five elements of sufficiency economy philosophy are applicable in the human capital development process, since they involved both self- and job-related development. These concepts, once completely implemented, would bring out three following outcome levels.

The first level is individual outcome in which an individual would be developed to be a complete human being who leads a work-life balance, with continuing drive for more knowledge while living a virtuous life in harmony with surrounding social contexts and environments. Personnel would have personal mastery in their works. They could work efficiently and effectively while taking into consideration the balanced mutual exchange of friendship and conducive values with their colleagues.

In the second level, with personal mastery, the personnel's career plan could be attained. The individual would be equipped with necessary skills and capability to proceed with their career. On part of the university, career development plans were designed and assist the personnel.

The third level is the performance outcome. Based on this philosophy, the human capital development policy is formulated in accordance with the staff's needs and capability, yet can develop them fully to their highest potentials. The operations could be conducted on a fair and transparent basis, thus rendering the staff to trust the executives and devote themselves to generate the organization's success as being the learning organization.

The fourth level is the organization outcome. The sufficiency economy philosophy not only benefits individual staffs, but also the whole organization. Once the smaller subsystems of individuals and organizations proceed to achieve the goal of efficient yet virtuous operations, the higher system would also attain the ultimate benefits from those smaller functioning units. Therefore, we may expect to have a healthy organization in which its members can live a better-quality life.

Conclusion

Data suggested that the application of sufficiency economy philosophy into human capital management, starting from planning, implementation, and evaluation, and the development of human resource potentials. The concepts of sufficiency economy philosophy of sufficiency, reasonableness, immunity, knowledge, and morality have coincided well with the universal concepts of human capital development to enable an individual to be knowledgeable, skillful, effective and efficient in working, while being honest and ethical in their work. As a result, they could perform their tasks on the basis of knowledge and experiences, yet were prepared to encounter the changing environments and situations. They would ultimately work happily while leading their organization to success by incorporating the sufficiency economy philosophy into their work.

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An examination of the essential competencies among support personnel of an international private university in Bangkok

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ABSTRACT

Competencies are essential in driving the success of an organizations. Support personnel in universities who possess knowledge, skills, and attributes could respond better to the changing requirements of the modern education system. The objective of this research study was to investigate the competencies required for effective performance among support personnel in a large international private university in Bangkok. Delphi technique was utilized. Informants included 8 heads of support operational units in the university to compile the required competencies among support personnel. Results suggested the essential competencies included service skills, continuous learning, knowledge enhancement, positive attitude towards the university. Furthermore, job rotation and on-the-job training were proposed to develop competencies.

Keywords: competency, private university, support staff, Delphi technique, Bangkok

Introduction

Competencies are essential in driving the success of organizations. Human resource planning should correspond with the strategic plan of an organization. McClelland (2020) argued that personnel with appropriate competencies could contribute to the efficiency and success of organizations. Hence, organizations should utilize competencies as the basis for human resources management. Werner and DeSimone (2006, pp. 15-16) conceived that human resources development encompasses four levels: individual development, team development, career development, and organization development. The emphasize are different in each level. The development in each level should be planned to equip necessary competencies for their works in organizations. In the individual level, development should aim toward the technical skill. In the team level, personnel are trained in human relation abilities and positive attitude in working with each other. In the career development level, personnel should be trained for their employability which might include technical, human relations, and conceptual skills for their future works. In the organization level, personnel should be trained to conceive the common direction and objectives of the organization.

Support staff in private university has an important role to provide various services for the teaching and learning process. Without them, the education system cannot be performed properly. Support staff are personnel in university who do not teach. Support staff in private university has to provide services to clients including instructors and students as well as outsiders. The scope of work ranges from gardening, cleaning, handout preparation, examination administration, facility, IT facility, to name a few. University relies much on the services of the support staff. They should perform their functions efficiently. Support personnel in universities who possess required competencies, i.e., knowledge, skills, and attributes could respond better to the changing requirements of the modern education system and various clients' requirements. Their performance facilitates the operation of university. This research study aimed to elicit essential competencies among support personnel in a leading private university in Thailand. The objective of this research project was to find out the competencies essential for support staff in one of the leading private universities in Thailand. The researchers aimed to disclose the functional competencies among support staff in a leading private university. The result of this study shed lights regarding the competencies necessary for work in private university. Human resource management department could utilize this knowledge for human resource management process, be it recruitment and selection, training and development, performance appraisal, and rewarding and compensation. Effective and efficient operations could be attained.

Literature

Gitman and McDaniel (2008, p. 277) suggested human resource management process consists of a) human resource planning which includes an organization need assessment and plans, b) recruitment and selection to fulfil the organization's need for personnel, c) training, development, and d) retention of personnel through appropriate performance evaluation and compensation plans. Dessler (2018) further commented that the process should include personnel relation, health and safety, justice, and well-being of personnel. Dubois, Rothwell, Stern, and Kemp (2010) further argued for the integration of competency concept into human resource management process in the recruitment and selection, training and development, and performance management systems. It is especially important to establish the criteria to recruit and select personnel possess necessary competencies for an organization. Test batteries and interview protocols should be designed to reveal applicants' competencies which can contribute to the performance of the organization. Furthermore, the training and development should aim to enhance and develop such competencies. Lastly, contrary to the traditional approach which evaluates immediate performance, modern day performance management system should be competency-based. This approach enables the organization to reveal the competencies which support the performance so the organization could further enhance such competencies. This helps organization to attain long-term performance.

Office of Human Resources Management, United Nations (2010) suggested three important categories of competencies: core competency, managerial competency, and functional competency.

> *Core competencies are the skills, attributes and behaviors which are considered important for all staff of the organization, regardless of their function or level. Managerial competencies are the skills, attributes and behaviors which are considered essential for staff with managerial or supervisory responsibilities.*

Core and managerial competencies are complemented by functional competencies. Functional competencies refer to the specific technical skill, attributes and behaviors relevant to the staff's duties and responsibilities in the areas of work. Both hard skills, i.e., technical skills, and soft skills such as motivation, believe, attitudes, and others are needed to perform a given job.

McClelland (2020) proposed 6 steps to evaluate competencies in work: a) identification of effective criterion; b) gather samples who attain higher standards and those who have average performance based on the criterion identified; c) collect data; d) match competencies revealed with tasks; e) assess the validity and reliability that the competencies could yield performance among the samples; f) utilize the competencies listed in the human resource management process.

Methodology

This research project is an exploratory study in which the objective was to gather opinions among heads of department or division in an international private university in Thailand. Delphi technique was utilized. After a discussion with the human resource director to recruit informants, the researcher purposively recruited 8 heads of support operational units in the university who provide various services to instructors and students. The informants included heads of registrar office, finance office, library, administrative office, building and facility, IT, sport center, and human resources department. The researcher interviewed these heads of support operational units to compile a list of competencies they believed were important for support staff to operate effectively. The questions did not specifically point to knowledge, skills, or attributes. Informants were allowed to express their opinions freely. After the interviews, the list compiled were distributed to these heads of support operational units to rate their agreement with each item on the list on a yes or no basis, the scores were either +1 for agree or -1 for disagree. After the informants returned their agreement scores, medians were calculated for each item. The list was redistributed to each informant with their original scores in comparison with medians obtained for each item. Informants were asked to reconsider their agreement with the items comparing to the medians whether they wanted to change their scores or not. Index of Item Objective Congruence (IOC) was calculated. The final results maintained only items with IOC higher than 0.67.

Results

Four informants were male and four were female. All of them have been working with the university for over 20 years. Ages ranged from 55 to 65 years old. Results were classified into the categories of knowledge, skills, ability, and attributes which was informed by the literature.

The heads of operation units expressed their concerns mostly about skills and ability to perform the jobs and the ability to acquire skills to perform other jobs at the present and in the future. Most informants agreed that skills to perform their jobs effectively were very essential. This included skills and abilities to perform the current job as well as the ability to acquire new skills to perform other jobs in the future. Updated skills on new approaches and equipment for servicing were also important. Personnel should possess knowledge about their jobs in order to provide appropriate information to

clients. Moreover, teamwork, collaboration, and communication skills were emphasized. Critical thinking and problem-solving skills were also raised. Most informants agreed that basically the staff need the skills and ability to perform their jobs and adjustment to changes in the environment.

Knowledge was mentioned secondly. This included the knowledge relevant to the job and the ability to learn up-to-date knowledge continuously. Some personnel lacked the ability to update their knowledge and keeping on the old style in providing services while the clients were more knowledgeable and better informed. Some informants also mentioned the willingness to learn new skills. Knowledge regarding the systems and procedures were also important. Most informants viewed knowledge in similar manner.

The third category was about the personnel's attributes such as positive attitude toward the university, leaders, and colleagues. Positive attitude toward the university was anonymously agreed upon. Furthermore, the informants mentioned the personnel should be committed and loyal to the university. They should adhere to the university's rules and regulations. They should perform their jobs with good mannered.

Discussion

Heads of operation units suggested the importance of skills to perform current job personnel were assigned as well as skills to perform jobs in other position. Apparently, this reflects the connection between a component of competency and performance. Without proper skill to perform the job, personnel would be unable to provide services effectively. Furthermore, the informants further mentioned the importance of acquisition of skills and abilities to perform other jobs. Probably, in order to run the unit smoothly, the heads expect personnel to fill in and perform other tasks in case personnel responsible for the job was not available. In addition, this might be also relevant for job rotation and advancement of personnel.

Knowledge was considered the basis of work. Personnel in support department should learn the system and procedures and understand them in order to perform the job properly. Not only knowledge about the current job is required, personnel should learn systems and procedures of other units as well. This could enhance the relationship among work units and make the work flows smoothly. One part of service should be the knowledge to promptly answer questions from the clients, be it students or professors.

Attributes and characteristics in providing services were also included in the important competencies of support personnel. The heads mentioned loyalty and positive attitude toward the university as well as leaders and colleagues. Positive attitude helps in retention of personnel. Apart from this, positive attitude makes personnel work more happily. They would be more tolerable and have good manners toward the clients. Personnel would be more willing to provide services. Positive attitude brings about polite and good-mannered service offerings.

The university emphasizes the providing of services to students hence personnel should keep their eyes open and be up-to-date in order to provide the services effectively. New knowledge and skills in providing services as well as new equipment, especially IT relevant systems, should be supported. Moreover, the systems and procedures should be revised and updated regularly to be able to create satisfaction and positive impression among the clients. The cooperation among the units also could yield satisfaction to the clients. Rather than having the clients to contact different unit by themselves, the personnel should facilitate them by connecting to each other to solve problems for clients without having the clients running around by themselves. Lastly, Mondy (2011) emphasized the importance of performance evaluation to enable personnel to learn their strengths and weaknesses so they could develop themselves in the right direction.

Conclusion

The findings of this research project suggested that personnel should have knowledge in job and skills and abilities to perform the job. In addition, they should have positive attributes about the colleagues. This confirmed that the component of competencies included knowledge, skills, abilities, and attributes. It is very important the personnel should posses these qualifications in order to perform their jobs effectively. The university should develop these competencies on a continual basis as well as to create positive attitude toward the university.

The university should schedule regular training and development programs such as job rotation and educational trips to have exposure to other institutions' services not limited to university but also other business establishments. This would assist personnel in the comparison of their performance and other establishment so they have opportunity to develop their performance. The compensation and rewarding should be in line with the evaluation.

Limitation

This study collected qualitative data from one private university in Bangkok. Although, this research project yielded interesting results which contributed to the administration of the university, the results may be specific to this locality as in a typical qualitative research project. The application of the results to other private or public university in other locations need precaution and further research specific to each location. Moreover, the data collection was performed during COVID-19 situation in which most contacts with clients were performed through online channels. This might yield different results if the university was opened and contacts were performed through normal channels.

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An investigation of the human resource management practices at Rajamangala University of Technology in Thailand

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ABSTRACT

Thailand's National Economic and Social Development Plan and Thailand's National Strategy Act stipulated that the country becomes a developed country that incorporates the Sufficiency Economy Philosophy. One of the major dimensions is the development and enhancement of human resource. Rajamangala University of Technology group of universities was incorporated from former technology and vocational schools throughout Thailand. The university specializes in technology and innovation education. This research project aimed at examining Rajamangala University of Technology's human resource management practices. Qualitative research methodology was utilized through in-depth semi-structured interviews with nine top administrators of three campuses. Findings revealed that the university considered the personnel's positions, responsibilities and abilities as the basis for human resource management plans. Professional training and further study were supported and funded. The universities established development programs for personnel throughout his/her career. Furthermore, efficient usage of resources was emphasized. The compensation plans were designed to support the achievement of personnel.

Keywords: Human resources management, Rajamangala University of Technology, human resources management, qualitative study, Sufficiency theory

Introduction

Thailand's 12th National Economic and Social Development Plan (2017-2021) was initiated based on Thailand's 20-year National Strategy Act (2017-2035) to be implemented as the master plan for the Nation's development. Six dimensions were incorporated in this plan as consisting of: national security, building competitiveness, developing and promoting potentials of human resources, generating opportunity and equality, supporting growth on environmental-friendly life quality, and adjusting balance and developing governmental administration system (Office of the National Economic and Social Development, n.d.).

The 12th National Plan incorporated the sufficiency economy philosophy which was introduced by the late His Majesty King Bhumiboladulyadej (King Rama IV). The philosophy argues that to attain sustainability, the development should be balanced in all dimensions based on three interrelated three principles: moderation, reasonableness and self-immunity toward change (risk management) (Chaipattana Foundation, 2017; Mongsawad, 2010). The moderation principle suggests people to live on the middle path with cautious, not to the extremes. The reasonableness principle calls for careful thoughts on all actions and be aware of the consequences of their actions. The self-immunity, or risk management principle supports that people should establish financial and network strengths that provide basis to protect themselves against external turbulence and be able to cope with unpredictable environment. Furthermore, these principles should be based on knowledge and morality in order to be sustainable. This implies that proper management of risk is one of the required factors for sustainable development, so that human resources will be uplifted to the quality level and live a happy life. Equal opportunities will also be accessible for all so that peaceful co-existence in the society will be ultimately achieved.

The third dimension of the 20-year National Strategy Act focused primarily on the development of human resources of all age ranges and in every aspect, so that they become virtuous, intelligent, and quality-oriented (Office of the National Economic and Social Development Council [NESDC], 2018, p. 2). Hence, to attain the goal of being a developed country, Thailand needs a bunch of skillful Thai people, with proper readiness for life-long learning to improve themselves and the country. The ultimate goal of this strategy is to create a highly-skillful and moral Thai people, with an orientation of self-discipline and social responsibility.

Therefore, a well-planned development approach is to change requisite values and cultural aspects to achieve fruitful paths to create desirable society. In this case, educational reforms in all levels, from primary to life-long learning, are unavoidable (Office of the National Economic and Social Development Council [NESDC], 2017, p. 85)

Office of the National Economic and Social Development Council [NESDC] (2007, p. 1-17) also incorporates the sufficiency economy philosophy into its context. This philosophy was initiated by the late King Rama IV, and it focused basically on the sufficiency path of living, supported solidly by knowledge and morality. It was meant to lead people to sustainability amongst globalization and drastic global changes. In this regard, developing human resources in any organization toward efficiency is inevitable.

Rajamangala University of Technology as a higher education institute has an important role in providing quality learning, research, community services, and preservation of invaluable Thai culture, fruitful environments, and national religions. In this aspect, the university' main mission aims for good governance, by upholding on the sufficiency economy philosophy, and concentrating on promoting good quality of life among the staff (Rajamangala University of Technology, 2020).

As a result, the purpose of this research aims primarily at examining the practices and approaches of personnel management on the basis of sufficiency economy philosophy of Rajamangala University of Technology in Bangkok, Thailand. The result of this research will contribute to the betterment of planning and implementation of human resource management programs, from which the faculty and staff will be put into a well-designed and implemented plan for lifelong self-development.

Literature Review

Gilley, Eggland, and Maycunich (2002, p. 96) stated that human resource development aims at generating human learning, effectiveness, and changes. Formal and informal activities to create initiative thinking and administration are needed to increase job efficiency, human potentials, readiness for change, and self-adaptation.

Harrison and Kessels (2004) indicated that human resource development is a process in which planning and expertise supports are provided. This will finally lead to formal and informal learning and knowledge and experience creation to reach organization growth and increase staff potentials. In this aspect, knowledge-generating activities that focused on competency development, adaptation, and solidarity, have been playing a significant role.

Swanson and Holton (2009) also stated that human resource development included the process to generate expertise of staff via organizational development and training which will lead to human resource management, career path development and quality improvement. The needed outcome concerns job improvement and efficiency.

Sherman and Bohlander (1992) mentioned 3 aspects of human resource development as following:

1. Organization-wise: human resource development will uplift staff's positive attitude, improve their knowledge and skills, and make them well aware of organization's policy. Proper human resource development will eventually improve organization's business and communication with staff of all levels.

2. Staff-wise: human resource development will expedient job-related decision and problem solving, as well as make them realize the importance of personal success, responsibility, and advancement. Their confidence in job will be increased, with higher skills in communication and knowledge improvement. At the same time, job-related stress, dissatisfaction, and conflict will also be lessened. The ultimate outcome will involve job satisfaction and acceptance.

3. Human relations wise: human resource development will improve between-group communication and hence create equal opportunities in working and group solidarity. Moreover, fruitful atmosphere in learning and cooperation as well as competency improvement will arise and pleasant work environments will follow suit.

Nadler (1980) explained that human resource development used activities to modify the staff's behavior. Those strategies include:

1. Training: focusing on increase job competency of the staff, so that they will work more efficiently while responding to the organization's needs

2. Education: to prepare the staff for special jobs in need of the organization in the future. This may be the investment for future expansion of the organization.

3. Development: to induce desirable changes in the organization to respond to future growth and incessant changes. These activities involve programs to implant more knowledge and experiences so that they will be ready to face future changes.

The sufficiency economy philosophy focused on increasing visions regarding sustainable development in four aspects as following (Issarangkul na Ayudhya and Pibulsarawut, 2010; Kaemanee, 2016):

1. Balanced development: in terms of using necessary resources for development in the personal, organizational, and governmental levels. Those resources include materials, funds, ecological systems, as well as social resources, culture, traditions, lifestyles, values, etc. The goal of development will be set with dynamic balance, not merely physical growth as in the past.

2. Public interest as development goal: The holistic view of development activities aims to link men with nature and all social members. Hence, an individual's action will inevitably affect the whole society. As a result, while we aim at the public interest, we should perform well in our own responsibility. The concept of "think global, act local" should be implemented for personal and public interest.

3. Development foundation: Fruitful development should start from basic foundation. That is, economic strength should start from the lowest level, or the family, and then applying the step-by-step development approach up to a group level, i.e. career promotion, learning system management, and community welfare provision. This low-level development will eventually benefit the larger social groups and avoid the occurrence of risks and system collapse as in the past.

4. Quality of people: Virtue with knowledge is supported to be the core of living, so as to attain sustainable development. Thai people are expected to be logically intelligent to lead a better living so as to improve themselves and the society.

Methodology

Qualitative research methodology was utilized through an in-depth semi-structured interviews with nine top administrators of three campuses of Rajamangala University, or three of each institute. The three campuses are Rajamangala University of Technology Krungthep, Rajamangala University of Technology Rattanakosin, and Rajamangala University of Technology Phra Nakhon. The key informants had been working with their respective universities for more than ten years. The current positions were dean of faculty or higher. Four Vice Presidents and Presidents were included. Each interview lasted averagely for one hour. The interviews were conducted from July 1 to December 15, 2021. Questions asked about the human resource management plans and practices of the university and how were the sufficiency economy philosophy incorporated in the practices. Themes were compiled from the interview data.

Results

The interviews were transcribed and themes were elicited. The presentation of results uses the term "Informant XX" to represent each key informant in each theme. Numbers run in each theme and start from 1 in another theme, i.e., informant 1 in theme 1 may be another person from informant 1 in theme 2 and so on. Some important comments in each theme are quoted as follow:

1. Opinion about human resource management based on the sufficiency economy philosophy

The key respondents agreed that human resource management on the basis of the sufficiency economy philosophy is an approach to implant the staff with knowledge, ability, and morality for sustainability.

Informant 1 put it that *"...this approach of human resource management leads to social responsibility*

and team working, and can drive the organization to handle social changes..."

Informant 2 mentioned that *"...human resource management based on the sufficiency economy philosophy will help increase efficiency among the staff in all working levels..."*

Informant 3 inserted that *"...the staff of all levels should be developed to have higher potentials via advanced studies or study tour, visits, etc. so as to achieve further organizational development..."*

Informant 4 agreed that *"...this kind of human resource management is a sustainable approach since it incorporates sufficiency, reasons, immunity, knowledge, and morality, and these 5 dimensions will definitely benefit the whole organization..."* and that *"...the sufficiency approach as mentioned earlier corresponds well with the development concept of United Nations Development Programme or UNDP that focuses on human as the core of sustainable development..."*

2. Building awareness and understanding of human resource management based on the sufficiency economy philosophy

The university has included sufficiency approach in work process. Hence, personnel are aware of the human resource management process based on the sufficiency economy philosophy.

Regarding the promotion of awareness and understanding among personnel, informant 1 exerted that *"...the university has applied the sufficiency approach in daily work, by using available resources to the most efficiency usage level and emphasizing on knowledge-based operation, logical reasoning, self-discipline, understanding and adaptation to incurring changes, ability to use technology, and virtue-oriented..."*

Informant 2 commented that *"...the university lays a solid foundation of modern technology and international standards in learning, staff development, and up-to-date curricula. The graduates will be equipped with both theories and knowledge application as well as creativity. As a result, they will possess all qualifications in accordance with the institute's identity of: unity (U) among the faculty, staff, and students to work for the benefits of institute and government; talent (T) of unique capability; and keen (K) to have expertise in both theories and application in terms of creative technology..."*

3. Forming practices regarding human resource management based on sufficiency economy philosophy

The university has encouraged the personnel for further study and training through annual human resource management program. Rewards are provided based on performance. Resources are provided to support personnel's development.

To promote human resource management based on the sufficiency economy philosophy, informant 1 elaborated that *"...the university encouraged the faculty and staff to further their advanced studies and/or participate in discipline-oriented training in accordance with the annual plan of human resource development..."*

Informant 2 explained that *"...welfare is also provided and awards granted to those with excellent performance."*

In addition, informant 3 suggested that *"...human resource development was planned for the personnel based on their positions so that the staff will join in the designated training program to uplift their potentials as deemed appropriate with their ability..."*

Furthermore, informant 4 mentioned that *"...they (staff) were encouraged to use available resources to the maximum level and recognize the significance of self-discipline to induce sustainable development.*

As a result, they will be ready to face economic, social, environmental, and cultural changes following the path of sufficiency economy philosophy…"

4. Principles in setting plans in human resource management based on sufficiency economy philosophy

Structure is formed to provide guideline for staff evaluation. Mutual learning is promoted.

Informant 1 explicated that *"…a committee was formed to gather task-related information annually and formed a 5-year plan to be used as a guideline in evaluation of staff performance. Such development plan is based on tasks of an individual staff. For example, a faculty member will be encouraged to further their advanced studies or acquire higher academic titles. To enhance the application of sufficiency economy concepts, the personnel need to understand and apply the concepts well, i.e., life-long learning development, virtue orientation, honesty, endeavor, and perseverance in working. The personnel will also be inspired to work to achieve the organization's goal and personal advancement…"*

Informant 2 commented that *"…the process of mutual learning is requisite in applying the sufficiency economy concepts. That is, in terms of sufficiency, the personnel must be provided with opportunities as they deserve or fit with their abilities. They must also be inspired to be enthusiastic in self-development and self-reliance. In terms of reasons, they should be promoted in making decision based on non-biased reasoning, not emotions. With regard to self-immunity, they should be warned to properly face both positive and negative impacts and changes while maintaining standardized and impartial administration. Hence, the application of sufficiency economy philosophy in personnel management is to secure the balanced operation for the staff and the organization…"*

5. The implementation of in human resource management based on sufficiency economy philosophy concepts

Work plan is devised to implement the human resource management initiatives. Staff are required to formulate own development plan and evaluated based on such plan.

Informant 1 replied that *"…the implementation of the human resource development based on sufficiency economy philosophy concepts started with initiating the annual work plan in accordance with the institute's strategy…"*

Informant 2 suggested that "…*each of the staff also needs to formulate his/her personal development plan, and evaluate whether his/her performance follows the set plan or not. In other words, the succession plan was set up so that the work in key position follows the leadership continuity. That is, the personnel are trained to possess leadership and readiness for that particular position…"*

Informant 3 explained that *"…the well-rounded human resource development must integrate the concepts of sufficiency, reasons, and self-immunity to correspond with the development in the contexts of economy, society, and ecology system, with mutual supports and reliance and no negative impacts on other development dimensions…"*

Informant 4 added that *"…the staff will be promoted to be the "center of development," so that they will also be virtuous and talented with potentials and creativity. As a result, competitiveness will be enhanced to generate strength, morality, social responsibility, as well as to preserve, restore, and properly use the available natural and environmental resources…"*

6. Promoting the personnel to possess sufficiency, reasons, knowledge, and morality

Morality and disciplines are promoted among the staff. Information regarding the strategies is disseminate thoroughly to create mutual understanding.

Informant 1 explained that "*…manpower is arranged to fit work efficiency, and the personnel will be supported to acquire knowledge and skills in accordance with their career path. The concept of sufficiency economy philosophy will be promoted on the continual basis to create quality and ethical teamwork…*"

Informant 2 commented that "*…staff are encouraged to participate in professional seminars and further studies free of charge…*"

Informant 3 explained that "*…measures in maintaining morality and disciplines in organization should be initiated, with work regulations determined to promote knowledge among the staff about sufficiency economy philosophy via available exhibitions and publications…*"

Informant 4 suggested that "*…communication to the staff at all levels to disseminate information about the institute's strategies is required, together with proper monitoring to ensure the attainment of annual job indicators, both quantitatively and qualitatively, that concerns customer satisfaction. The final report will be submitted to the Board of Trustee and will be used as a basis for further planning in the following year…*"

7. Approaches in the human resource management in Rajamangala University

Sufficiency economy philosophy is incorporated into the management process and activities.

Informant 1 suggested that "*…The principle of knowledge management was applied in the process of human resource development in all aspects in accordance with the concepts of sufficiency economy philosophy. The staff were encouraged to implement the said concepts in their work and daily life…*"

Informant 2 explained that "*…the five aspects of sufficiency economy philosophy (sufficiency, reasons, self-immunity, knowledge, and morality) were brought into the management process and related activities so that the faculty, staff, and students will be elevated to their highest potentials and apply those potentials to the benefits of themselves, the organization, and the community…*"

Informant 3 explained that "*…As for the institute, performance evaluation was conducted each semester to improve work efficiency, and proper compensation was provided to each personnel. In this case, self-evaluation was supported so that each personnel can see whether they perform up to the organizations' goals or not…*"

Informant 4 added that "*… evaluative indicators relating to knowledge, skills, and work attitude are set, and the evaluation result will be used to generate work motivation for further improvement and development. In this case SWOT analysis both within and outside the institute was continually conducted to see factors that will affect the institute's performance…*"

Discussion

The plans in human resource management based on the sufficiency economy philosophy concepts help to guide the institute's operation on the path of sufficiency, reasons, and self-immunity on the basis of

knowledge and morality. As for the staff, the said policy and implementation lead them to live a quality life by knowing oneself and avoiding temptation to acquire things more than they could afford. Risks and conflicts which may arise along their career movement should be cautiously managed.

The aforesaid human resource management on the basis of sufficiency economy philosophy via institutional governance will open opportunities for self-development among the faculty and staff. They are developed on individual basis. The understanding of oneself helps them to learn their strengths and weaknesses and would be trained to compensate the weaknesses. In this aspect, they will be evaluated and compensated based on their job-related performances. This impartial and self-evaluation uplifts the personnel's morale in working while improving their work efficiency. The ultimate outcome will benefit the students' learning process and elevate the institute's instructional quality to the international standards.

The quality of the staff eventually leads to the quality of their students. By adhering to the principles and policy of the sufficiency economy philosophy, the faculty and staff will be trained to elevate their qualifications in both academic and professional to the international standards. Besides, they will live their life as a perfect human being in a balanced manner. So, while they get ready to face and accept incurring changes (i.e., technology disruption, new normal living in the epidemic disease) supporting or threatening the institute, they will welcome them while being protected against negative outcomes that may arise from those changes.

The personnel of Rajamangala University of Technology are expected to be equipped not only with knowledge and virtues, but also with opportunities of life-long learning to acquire new knowledge and face unavoidable changes, so that they will apply self-discipline and self-adaptation in their life to continually improve themselves, the society, and the country at large.

Conclusion

Rajamangala University of Technology has been promoting sufficiency philosophy into human resource management plans. This includes the enhancement of moderation, reasonableness, and immunity to uncertainty. The university assesses individual personnel in order to establish an appropriate training and development program for each individual throughout his/her career. An emphasis was placed on the good governance through just and transparent human resource management system. Evaluation system was based on the performance goals. Rewards and compensation plans were designed to complement the training and development objective of the personnel.

Limitation

This study was performed during the COVID-19 situation. The opinions of the informants might be affected by the operation during the situation in which most contacts were done through online methods. It is likely that they might deem ability to use the internet an important qualification while it might not be as much important in normal situation. Secondly, the data collections were performed in Bangkok campuses. Although, all Rajamangala University of Technology adopted the same central policy, some practices might differ in provinces. Results from this study is likely to be applicable for all campuses in Thailand, applications in other campuses should be further studied. Moreover, the utilization of these practices in other universities need to be careful and selective.

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Essential competencies of support staff in private universities in Thailand: A factor analysis study

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ABSTRACT

This research study aimed to elicit the competencies essential for support staff in private universities in Thailand. In spite of available literature regarding competencies in various context, this study sought specific competencies needed among support staff in private universities. Hence, exploratory data from real practices were gathered from experts and compile inductively. The listed compiled was confirmed deductively by personnel. Twenty-four heads of department from 3 largest private universities in Thailand were recruited to conduct focus group interview. The researchers facilitated the focus group interview. Data from the interview were compiled into a questionnaire consisting of two sections. The first section elicited demographic data. The second section contained 42 items derived from the focus group interview. Samples were drawn from top 3 largest private universities in Thailand. 692 sets of usable questionnaires were obtained. Exploratory factor analysis (EFA) rotated by the equamax method was performed. Results revealed four components (1) human relations skills, (2) critical thinking skills, (3) operational technique skills, and (4) personality. Overall, all four components explained 63.198% of the variance.

Keywords: competency, private university, support staff, factor analysis

Introduction

Novicevic, Hayek, and Fang (2011) described that human resource management's goal is to support personnel to work together cooperatively. Human resource management process includes a) human resource planning b) recruitment and selection c) human resource development and retaining (Gitman and McDaniel, 2008); and Bhanugopan, Aladwan, and Fish, 2013). Dubois, Rothwell, Stern, and Kemp (2010) suggested the process should focus on competency basis, in other word, organizations should perform human resource management function focusing on competency, i.e., competency-based recruitment and selection system, competency-based training and development system, and competency-based performance management system.

Investment in human resources development is essential for organizations in the modern days. Human resources development involves activities aimed to increase the capacity of personnel. These activities include education, training, development and learning (Garavan, 1997). Masadeh (2012) explains that education refer to formal and informal accumulation of academic knowledge. Training is related to skills to function in a job position. Lippert, Granger and Case (2007) describes that education is associated with problem diagnosis while training is more about the ways to resolve problem. Learning is the combination of training and education, usually on a lifelong basis, in order to perform a job. Furthermore, development is related to the utilization of various activities, is wider in scope and aim more for future impact than learning or training.

Human resources development is a process aimed to create learning in order to enhance efficiency and human potentials to cope with the changes and adaptation in the modern world (Gilley, Eggland, and Maycunich, 2002). Werner and DeSimone (2006) elaborated that human resource development aims to develop in four levels. The development of individuals to attain knowledge, skills, and behaviors necessary to perform their jobs. The development of personnel's career through elaborated plans and work directions for individuals to continuously learn knowledge, skills, and behaviors necessary for future job positions in an individual's career. The development of the organization through the continuous improvement of holistic quality or learning organization which promote mutual and sharing of learning throughout an organization. The development of performance through justified and transparent evaluation process.

University personnel performs activities to support the teaching and learning. They provide services to lecturers and students. These services range from supports in teaching and learning, registration, building and facilities, library, human resource management, printing, extracurricular activities, sports, well beingness, cleaning, gardening and many other activities. In this regard, support personnel are important human resource of universities. Operations of universities' required personnel to possess needed competencies, i.e., skills, capabilities, as well as attitude contributing to the mutual goals of the personnel. The competencies needed are different and more complicated than other contexts such as staff in fast-food chain. The objective was to find out specific essential competencies which can enhance the operations among support staff in the real practices. It is important to find out necessary competencies required to perform their duties efficiently. Hence, this research project's objective was to investigate necessary competencies which human resource in private universities in Thailand should possess. The results contribute to the effective management of human resource development program in private universities which is important for performance of private universities.

Literature

Hoffmann (1999) defined competency as the underlying attributes of an individual to attain work results. These attributes include knowledge, skills, capabilities, and other characteristics such as attitudes and personality among others. These attributes are difficult to measure on the overall level hence most of

the time organizations use behavior performance relevant to vision and goals of the organization to measure personnel's competency.

University of Nebraska-Lincoln (n.d). exerted that competency should be aligned with an organization's culture and values. Organizations should enhance a combination of attributes which support organizations' direction and mission. Moreover, these attributes should support short-term and long-term goals. Organization's performance could be attained through the development of appropriate competency among personnel. The recruitment and selection should focus on attributes necessary to perform the jobs. Furthermore, performance appraisal, rewards and compensation should be tied to the evaluation of these competencies.

Methodology

This research project was a survey research project aimed to find out the specific competencies essential for personnel in private university in Thailand. The data collection was designed to be two phases. The context was specific to private university in Thailand which was different from previous literature hence, an exploratory research methodology was utilized to gather specific competencies considered essential in practice at the universities inductively. Smithikrai (2013) and Thananun (2014) suggested that brain storming from experts is an effective approach to derive competencies relevant to job positions. The first phase gathered data through focus group interviews. The researchers conduct 3 focus group interview sessions in three largest private universities in Thailand in term of numbers of students based on data obtained from the College of Innovation Management, Mahidol University (2019). Eight heads department in each university were recruited randomly by each of the 3 universities' directors of human resource department. Altogether 24 heads of department were interviewed to obtain practical information. Questions, as suggested in the literature, were related to attributes informants think support personnel need in order to perform their jobs well. The focus group interviews elicited data relating to attributes considered important for support staff in private universities in Thailand. Data from the focus group interviews were edited and complied into a 56 items questionnaire with 5-point rating scale ranging from 1 = highly disagreed to 5 – highly agreed. The questionnaire was utilized in the second phase of the research project.
The second phase was designed to elicit data deductively relating to the agreement of support personnel regarding the competencies suggested by the informants. Director of the human resource department distributed the compiled questionnaire to support personnel in their university randomly. 900 sets of questionnaire were distributed. After the editing and cleaning of questionnaire, 540 usable sets of questionnaire were obtained.

Results

Data were examined through Kaiser-Meyer-Olkin method. The KMO was 0.872. Bartlett's test of Sphericity revealed that the correlations among the variables suggested the data set was appropriate for factor analysis procedure ($p < .000$) (Gorsuch, 2014). The results were entered into an exploratory factor analysis and rotated by Equamax rotation method. Items with higher than 0.30 factor loading were maintained (Kerlinger, 1986: Kim & Mueller, 1978).
Finding revealed 4 components with higher than 1.00 eigen value. These 4 components altogether explained 61.963% of the total variance. The first component included 12 items, the eigen value was 19.370. These 10 items in the first component could explain 47.696% of the total variance. The second component explained another 7.395% of the variance, the eigen value was 1.592. Nine items were covered in the second component. The third component explained 4.184 of the variance, the

Eigen value was 1.370. Nine items were covered in the third component. The fourth component explained another additional 2.688% of the variance, the eigen value was 1.067. Four items were included in the fourth component. Eigen values variances explained, numbers of items, and sum of squared loadings are presented in table 1.

Table 1: Results of exploratory analysis model for essential competencies of support personnel in private university

Component	Eigen value	% of variance explained	Cumulative % of Variance	Numbers of items	Factor loadings
1	19.370	47.696	47.696	12	.574-.691
2	1.592	7.395	55.091	9	.524-.720
3	1.370	4.184	59.275	9	.518-.646
4	1.067	2.688	61.963	4	.543-.735

The first component included items related to interpersonal relationship. The second component were related to critical thinking ability in work. The third component included technical skills. The fourth component included personality and characteristics. The factor loadings of the items are shown in tables 2-5.

Table 2 The first component: Interpersonal relatinship

Component	item	Essential competency	Factor loading
Interpersonal relationship	28	Want training by experts and specialists	.610
	29	Communication skills with colleagues	.672
	30	Motivation skills to motivate clients	.641
	31	Improved positive work attitudes towards works, colleagues, and organization	.691
	32	Knowledge and skills to create positive attitudes toward providing services	.638
	33	Teamwork skills	.672
	34	Interpersonal skills with colleagues and clients	.601
	35	Want to create and enhance strong and effective teams that work toward the same direction	.612

36	Activities to create good relationship among colleagues	.610
37	Knowledge and skills to create good relationship with clients	.578
38	Improved personality, manner, attires	.574
39	Emotional intelligence	.610
	Eigenvalue 19.370	
	% of variance explained 47.696	

Table 3 The second component: Critical thinking ability

Component	item	Essential competency	Factor loading
Critical thinking	01	Knowledge and skills in solving problems	.719
	02	Critical thinking	.720
	03	Creativity in providing services	.675
	04	Systematic thinking	.566
	05	Decision making ability	.645
	06	Operation process analytic thinking	.629
	07	Planning	.627
	18	Positive attitudes	.524
	19	Knowledge about the policy and procedures of work	.527
		Eigenvalue 1.592	
		% of variance explained 7.395	

Table 4 The third component: Technical skills

Component	item	Essential competency	Factor loading
Technical skills	08	Work process creativity	.518
	09	Work structure redesign	.570

10	Effective resource allocation	.589
11	Enhancement of creativity in works among department	.597
12	Enhancement of positive attitude toward the university	.584
13	Work skills	.599
14	Work process operation	.618
15	New approach to perform works	.646
16	Skills in providing service effectively	.643
	Eigenvalue 1.370	
	% of variance explained 4.184	

Table 5 The fourth component: Personality

Component	item	Essential competency	Factor loading
Personality	20	IT knowledge	.543
	40	Development of personality in providing services	.565
	41	Persuasion	.727
	42	Development of characteristics	.735
		Eigenvalue 1.067	
		% of variance explained 2.688	

Twelve items were loaded in the first component, interpersonal relationship. Factor loadings ranged from 0.574-0.691. The top three items with the highest factor loadings in component 1 were item 31 'improved positive work attitudes toward works, colleagues, and organization', item 29 'communication skills with colleagues', and item 33 'teamwork skills.'

Nine items were loaded in the second component, critical thinking. Factor loadings ranged from 0.527-0.720. The top three items with the highest factor loadings in component 2 were item 2 'critical thinking', item 1 'knowledge and skills in solving problems', and item 3 'creativity in providing services.'

Nine items were loaded in the third component, technical skills. Factor loadings ranged from 0.518-0.643. The top three items with the highest factor loadings in component 1 were item 31 'skills in providing service effectively, item 15 'new approach to perform works', and item 14 'work process operation.'

Four items were loaded in the fourth component, interpersonal relationship. Factor loadings ranged from 0.543-.735. The top three items with the highest factor loadings in component 1 were item 42 'Development of characteristics', item 41 'Persuasion', and item 40 'Development of personality in providing services.'

Discussion

The essential competencies derived from the data included 4 components. The first was interpersonal relationship skills. The support staff reported they should be able to communicate with others, be it colleagues or clients as well as working in team. This skill is very important to relate human resource with other people. As personnel performed support jobs, they need to understand the needs or others through communication in order to provide appropriate services. Moreover, interpersonal relationship skills enable them to understand their colleagues and could work together smoothly. This created good work atmosphere and cooperation among the staff.

The second essential competency was critical thinking in order to solve problems in work. Support staff should have creativity and ability to provide effective services to clients. They were frontline officers and felt they should be able to make appropriate decision to service clients.

The third most important competency was technical skills in performing their jobs. They should be experienced in work and services. Staff should learn the right procedures to perform their jobs. Creativity and work skills were necessary to work and service providing. They should have technical skills to cope with problems in works.

The fourth most important competency was personality and characteristics. They reported that they should have appropriate attires and persuasion skills in order to increase their credibility in their jobs. Pleasant personality creates positive impression and trustworthiness for them.

Conclusion and Implications

The findings revealed important competencies which private university could emphasize in their human resource management process, i.e., recruitment and selection, training and development, performance appraisal, reward and compensation, career planning and succession plan. Human resource department should design test or interview banks which can identify the abovementioned competencies in order to recruit appropriate support staff with suitable attitudes to function effectively in private university. These essential competencies should be used for performance appraisal purpose. Administrators should evaluate and find competency gap among personnel in order to design effective training and development programs to upgrade the ability of individual support staff. Moreover, the reward and compensation plan should base on the essential competencies. Hence, support staff would be motivated in the right direction to attain effective performance for the university. This could enhance motivation among support staff to develop themselves further. The compensation plan would be transparent and justified. Furthermore, the appraisal of the essential competencies enabled the university to identify strengths and weakness of each staff, hence, career planning and succession plan could be designed accordingly.

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SEAAIR 20/20: A review of SEAAIR annual conferences 2000 – 2021

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ABSTRACT

Since its establishment in 2000, the South East Asia Association for Institution Research (SEAAIR) has organised the SEAAIR Annual Conference in different countries in South East Asia (SEA), including the extension of SEA which was China (2002), Taiwan (2019) and Korea (2022). Each year, the conference focuses on different themes based on the country's institutional research and current educational and socio-economic development. The paper reviews the development of SEAAIR conference themes and subthemes to reveal the relatedness of the conference theme based on the country's contemporary educational or socio-economic development. The analysis of the paper submission based on the country for 2001 – 2021 is presented to provide an analysis of the trend and active participation level of the countries at the SEAAIR Annual Conference.

Keywords: Institutional Research, Quality Management, Teaching and Learning, Education Technology

Introduction

The South East Asia Association for Institutional Research (SEAAIR) celebrates its 20th Anniversary in 2021. Such celebration indicates that SEAAIR has also been organising the 20 Annual SEAAIR Conference, leaving its footsteps in various countries in Southeast Asia and East Asia. Therefore, it is the right time to review the achievements in the past two decades and set a direction for the coming years.

The process of the establishment of the SEAAIR was initiated after a successful discussion between the Association for Instructional Research (AIR) and Dr Raj Sharma (founder and Inaugural President of Australasian AIR) in 2000 (SEAAIR, n.d.) As the outcome of such discussion, an Interim Management Committee (IMC) and the Annual SEAAIR Conference 2001 were successfully held in Kuching. Following the AGM, the new SEAAIR Executive Committee was elected to manage the association's operation.

The Annual SEAAIR Conference is organised to gather researchers and the institution's key personnel of the Institutes of Higher Education (IHE). Most delegates from the ASEAN countries and some from outside the ASEAN region meet and discuss the advancement of institutional research in the region based on the conference's theme.

Although the Annual SEAAIR Conference is an academic conference, this is not solely focusing on the academic research paper presentation and panel discussions on the theme. The conference also promotes cultural exchanges between the countries. For every conference, the host university organises cultural events such as cultural nights or city tours to introduce the country's culture to the delegates.

The conference theme sets the tone for the conference, provides an objective and a direction for all discussions held during the conference. In a few words, the theme communicates the host university's intent for the conference based on the university's values and direction and the contemporary development in the country or region.

On the other hand, the subthemes provide further elaboration to the conference theme, where delegates have a more detailed discussion from different angles and perspectives. The subthemes serve as a divergent-convergent thinking mechanism and provide the delegates with a practical brainstorming session. During the divergent thinking process, the ideas from the delegates were gathered through the question-and-answer sessions of the keynote speeches, panel discussions and full-paper presentations. The moderators then converge such ideas based on the conference theme into an essential takeaway to the delegate at the end of the conference.

This paper presents a detailed analysis of the conference themes and subthemes, highlighting the similarities and differences of these themes and subthemes based on various comparing criteria. Such a presentation aims better to understand the relevance of such themes and subthemes, providing a reference for future conferences.

The limitation of the study

Table 1 summarises the availability of the information on the Conference Theme, Sub-themes, and Proceedings for the SEAAIR Annual Conference 2001 – 2021. It should be noted that the information is obtained from the SEAAIR website (SEAAIR, n.d.). Hence there was some missing information due to the unavailability of information on the website.

Furthermore, the COVID-19 Pandemic hit the world in 2020 and 2021. The postponement of the Annual SEAAIR Conference 2020 in Malaysia was the reason for the unavailability of the information for 2020.

Organised by the SEAAIR Executive Committee, the Annual SEAAIR Conference 2020 was held on the virtual platform for the first time; hence, the host for this year was listed as Virtual.

Table 1: The availability of the information on the Conference Theme, Sub-themes, and Proceedings for the SEAAIR Annual Conference 2001 – 2021.

Year	Reference	Conference Theme	Conference Sub-Themes	Conference Proceedings
2001	(SEAAIR, n.d.)	☒	☒	☒
2002	(SEAAIR, n.d.)	☒	☒	☒
2003	(SEAAIR, 2003)	☑	☒	☒
2004	(SEAAIR, n.d.)	☑	☒	☒
2005	(SEAAIR, 2005)	☑	☑	☒
2006	(SEAAIR, 2006)	☑	☑	☒
2007	(SEAAIR, 2007)	☑	☑	☑
2008	(SEAAIR, 2008)	☑	☑	☑
2009	(SEAAIR, 2009)	☑	☑	☑
2010	(SEAAIR, 2010)	☑	☑	☑
2011	(SEAAIR, 2011)	☑	☑	☑
2012	(SEAAIR, 2012)	☑	☑	☒
2013	(SEAAIR, 2013)	☑	☑	☑
2014	(SEAAIR, 2014)	☑	☑	☑
2015	(SEAAIR, 2015)	☑	☑	☑
2016	(SEAAIR, 2016)	☑	☑	☑
2017	(SEAAIR, 2017)	☑	☑	☑
2018	(SEAAIR, 2018)	☑	☑	☑
2019	(SEAAIR, 2019)	☑	☑	☑
2020	(SEAAIR, n.d.)	☒	☒	☒
2021	(SEAAIR, 2021)	☑	☑	☑

Host Universities

Over the 20 years, Annual SEAAIR Conferences were hosted by universities from eight countries, six located in Southeast Asia and two in East Asia.

Figure 1 shows the map of the host countries for Annual SEAAIR Conferences from 2001 to 2021. In addition, Table 1 in the following section also illustrates the hosting country based on the year. Since the organisation was established in Malaysia, the countries hosted the most significant number of the annual conferences, which were 2001, 2002, 2006, 2009 and 2012, with the first conference receiving a great response of about 100 delegates (SEAAIR, n.d.). Within the 20 years, six out of 10 ASEAN

countries took a turn to organise the Annual SEAAIR Conference. The four countries worth future exploration are Brunei, Cambodia, Laos, and Myanmar.

From Figure 1, despite the conference being named the Annual "South East Asia" Association for Institutional Research Conference, the association also expanded its connection to China (2004) and Taiwan (2019), where the two conferences were successfully held outside the Southeast Asia region. The connection pool is further expanded in 2022, when the 22nd Annual SEAAIR Conference is held in Korea, making it the third external connection for SEAAIR.

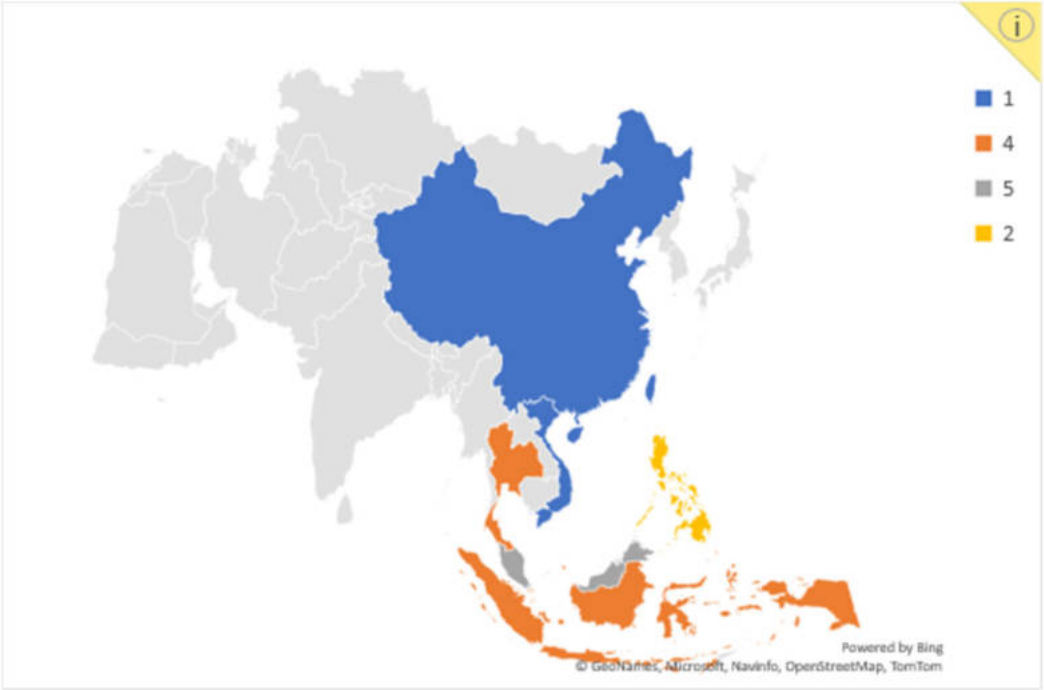

Figure 1: The host countries for Annual SEAAIR Conferences from 2001 to 2021. The SEAAIR 2021 was held on the virtual platform; hence, it is not displayed in the figure.

Conference Themes

The conference theme sets the conference's tone and agenda and gives the delegates the first impression. The clear tagline gives the public the core message of the conference, and the discussion sessions during the conference are designed based on this core message. The conference themes attract academics keen to address contemporary issues while keeping inclusive and welcoming touch (Edelheim, Thomas-Francois, Åberg, & Phi, 2017). Further quoting the author's description,

> *"Themes that aim at attracting those at the cutting edge, but keeping an inclusive, welcoming touch. The space filled with those words are often like miniature images, depicting the field of research with much sharper contours and brighter colours than can be achieved in the researching practice" (Edelheim, Thomas-Francois, Åberg, & Phi, 2017, p. 7).*

Table 2 shows the conference theme from 2003 to 2021. At a glance, the conference themes merely discuss what is concerned by the host country through an academic approach.

Table 2: The host countries and conference theme from 2003 to 2021.

Year	Host Country	Main Theme
2003	Thailand	Institutional Research and Quality Development in Higher Education
2004	China	Entrepreneurial University of the 21st Century
2005	Indonesia	Higher Education Reform Facing Local and Global Changes
2006	Malaysia	Transforming Higher Education for the Knowledge Society
2007	Thailand	Self-Sufficient and Sustainable Higher Education- An Agenda
2008	Indonesia	Institutional Capacity Building toward Higher Education Competitive Advantage
2009	Malaysia	The Future of Higher Education
2010	Philippines	Towards Global-ASEAN Institutional Research Strategic Alliances
2011	Thailand	University Social Responsibility: Pathways to Excellence
2012	Malaysia	Culturalizing World Class Higher Education in ASEAN
2013	Indonesia	Entrepreneurship In Higher Education and Institutional Effectiveness
2014	Philippines	Cross-Cultural Education in AEC 2015: Realizing Possibilities, Defining Foundations
2015	Vietnam	Internationalisation and Inclusivity of Higher Education in South East Asia
2016	Thailand	Academic and Social Engagement in Higher Education
2017	Singapore	ASEAN Higher Education at the Crossroad: Challenges, Changes, Capacities and Capabilities
2018	Indonesia	ASEAN@50: Sustaining Student Competencies and Employability
2019	Taiwan	Transforming Intelligence into Action in IR
2021	Virtual	Diversity in Education

Booming from the 1980s, entrepreneurship in China has generated significant economic growth. Such eloquent economic growth has brought the host country, China, to continue investigating the academic institution's contribution to the "Entrepreneurial University of the 21st Century". China has implemented the Five-Year Plan since 1957 (Economic Policies, n.d.) The plan was initially focused on industrial development at the expense of other sectors of the economy. Currently running on the 14th Five-Year Plan, the country seeks to deal with the worsening relations between China and the USA and the COVID-19 Pandemic that caused the economy to shrink in 2020. The academic discussion on the entrepreneurial university had fit nicely into the country's focus on the economy back then.

Indonesia is the largest economy in Southeast Asia that has been performing well economically since the recovery from the Asian financial crisis in the later 1990s (The World Bank, 2022). Furthermore, Indonesia managed to cut the poverty rate by half since 1999, to under 10%, just before the COVID-19 hit the country in 2020. Like China, Indonesia has a 20-year development plan from 2005 to 2025, segmented into 5-year medium-term development plans. Being the host country for SEAAIR Annual

Conferences in 2005, 2008, 2013 and 2018, which is where the 20-year development plan was running, the conference theme is all tailored to the contributions of the institutes of higher learning toward the growth economy, from the angles of reformation, capacity building, entrepreneurship, and economic sustainability. Such sequences also reflect how SEAAIR strategically contribute to the nation's economic growth by reforming the nation to ensure economic sustainability.

Host universities in Malaysia and Thailand designed the conference based on the education development in the country. Malaysia hosted the SEAAIR Annual Conferences in 2006, 2009 and 2012, which are in the Education Development Plan & Policy 2001-2010 and Education National Key Results Area 2010-2012 (Devan, 2021). The themes in 2006 and 2009 address the nation's education development well with the focus on the transformation, then planning the future for higher education in the region. As the country moved to focus on the Key Results Area, the conference organised in 2012 then addressed the need for "World Class Higher Education in ASEAN" to bring the higher education in the region to the next level, looking at the world's recognition of the institutions of higher education in Southeast Asia.

When the conferences were held in Thailand, the host universities took the opportunity to address higher education quality, sustainability, and social engagement. The Thailand National Education Commission announced the National Education Act in 1999 to reform teaching and learning methods and improve environments (Office of the National Education Commission, 1999) (Bureau of International Cooperation, 2008). In addition, the Tenth National Economic and Development Plan (2007 – 2011) introduced the concept of Education Sustainability Development. It directed the national development framework with His Majesty the King Rama IV's Sufficiency Economy (Nuamcharoen & Dhirathiti, 2018). Hence, the discussion on the quality of education with social engagement for education sustainability development fits nicely in the national policy and development plans.

SEAAIR Annual Conference placed its footstep in Vietnam in 2015. The country set the conference's tone on "Internationalisation and Inclusivity". The Vietnam government released the Higher Education Reform Agenda (HERA) 2005, which outlined a comprehensive strategy to reform the higher education system in the country from 2006 to 2020 (Hoang, Tran, & Pham, 2018). The strategy requests that higher education institutions address the country's socio-economic development to meet the demand for a highly skilled workforce which can be integrated into the international market.

The Association of Southeast Asian Nations (ASEAN) is said to be one of the keystones of the Philippines' foreign and trade policies (Shead, 2017). The Philippines has been actively participating in the ASEAN's regional agenda for its relevance and importance at the international level. The Philippines asserts that ASEAN should remain the central focus for internal and external dealings to continue driving regionalism and be the interlocutor between the competing powers in the region. The country has been actively promoting peaceful international trade that abides by the rules and practices that benefit the region. This is in tune with the idea of the AESAN Economic Community (AEC). Hence, it is easy to realise that conferences in 2010 and 2014 addressed the issues in ASEAN.

Singapore ranked 14 in the overall ranking of Best Countries measure global performance on various metrics in 2021, being the best country in the Southeast Asia Region (U. S. News, 2021). Furthermore, Singapore is also ranked the second most expensive city in the world (gov.sg, 2021). With these factors, the high cost of organising a regional conference is always the consideration of the host university in Singapore. Notwithstanding the high cost, the Annual SEAAIR Conference managed to record its first conference in Singapore in 2017. The Republic is at the forefront of the innovation in higher education to address the global technological paradigm shift in Industry 4.0, which was initialised in 2011 and then popularised in 2016 (Gleason, 2018); (Dima, 2021). The host university seized the opportunity to provide a platform to discuss challenges, changes, capacities, and capabilities of the higher education

institution to ensure that graduates can cope with Industry 4.0 and survive through the different ball games in the industry.

Taiwan Higher Education Institutions faced significant local and international challenges in the past decade, from pushing the universities to higher world university rankings to dealing with declining students. (Ching, 2021) One significant change observed was the establishment of Institutional Review Boards, Research Committees, and Institutional Research (IR) Centers, with 25 IR Centers reported in 2015. In line with such a reported number of IR Centers in the country, the Taiwan Association for Institutional Research (TAIR) was established in 2016 to support the IR activities in Taiwan and provide resources to the IR Centers (TAIR, n.d.) Worth mentioning that Taiwan is the only country in the east that is listed as the Affiliated Organisation for the Association of Institutional Research (AIR), after SEAAIR (AIR, Affiliated Organizations, n.d.) Therefore, it is observable that after a few years of its establishment, the 19th Annual SEAAIR Conference provided an opportunity for the country to start discussing "Transforming Intelligence into Action in IR" and learning from other members in the Institutional Research.

The COVID-19 Pandemic hit the world in 2020, and country borders were closed as part of the containment of the virus to stop the outbreak. Hence, the 20th Annual SEAAIR Conference, which was supposed to be held in Malaysia, was postponed. The condition improved in 2021, but most of the country's borders were still not ready to be opened. The SEAAIR Executive Committee decided that a Virtual Conference would be organised to maintain the continuity of the Annual SEAAIR Conference. The idea of Diversity in Education was adopted as the SEAAIR Executive Committee felt that diversity is the keyword for changes to be made in institutions to address the effects brought by this Pandemic. The two-day virtual conference was then organised to address the diversity in Instructional Research, Quality Management, and Teaching and Learning, sharing the best practices that the researchers in the region presented.

Conference Subthemes

Subthemes are topics that further elaborate on the conference theme specifically. The subthemes for Annual SEAAIR Conferences range from three to six, with most of the conferences addressing five subthemes (12 conferences in total). Conferences held in 2005 had three subthemes, while those of 2009 was held with four. On the other hand, Annual SEAAIR Conferences 2011 and 2016 in Thailand were held with six subthemes.

In the current analyses, a total of 79 subthemes were extracted from 15 conferences that were held from 2005 to 2021. These conferences are analysed based on eight categories. The group of criteria, Institutional Research and Development, Quality Assurance and Management, and Teaching and Learning, are the core objectives of SEAAIR. On the other hand, Educational Technology, Society and Culture, Education Sustainability, Creativity and Education, and Education and Industry are the second group of criteria that assist in better elaborating the conference theme. Ideally, all SEAAIR conferences must have the first category's subthemes to reflect the core business of SEAAIR. Table 3 illustrates the conference subthemes of Annual SEAAIR Conferences from 2005 to 2021.

Table 3: Conference subthemes of Annual SEAAIR Conferences from 2005 to 2021.

Year	Subtheme	Institutional Research and Development	Quality Assurance and Management	Teaching and Learning	Education Technology	Society and Culture	Education Sustainability	Creativity and Education	Education and Industry
2005	Strategy and Policy Analysis	x							

Year	Subtheme	Institutional Research and Development	Quality Assurance and Management	Teaching and Learning	Education Technology	Society and Culture	Education Sustainability	Creativity and Education	Education and Industry
	Quality Enhancement and Higher Education Management		x						
	Technology for Education and Teaching Learning			x					
2006	ICT in Higher Education				x				
	Higher Education Management		x						
	Quality and Continuous Improvement in Higher Education		x						
	Case-studies and Success Stories			x					
	Institutional Research	x							
2007	Institutional Research	x							
	Total Quality Assurance		x						
	Institutional Resources Based on Sufficiency and Sustainability						x		
	Teaching and Learning Mechanisms			x					
	Higher Education Management Practices Towards Sufficiency and Sustainability		x				x		
2008	Capacity building through Quality Assurance and Quality Management		x						
	Institutional Research in Higher Education Capacity Building	x							
	Managing and Sustaining Higher Education Competitive Advantage						x		
	Learning and Teaching to Enhance Institutional Capacity			x					
	Industrial Network to Support Higher Education Competitive Advantage								x
2009	Visioning for Excellence in Higher Education		x						
	Alternative learning Environments for Future Learners			x					
	Impacts of Quality on Future Higher Education Practices		x						
	Institutional Research and the Growth of Higher Education	x							
2010	Strengthening Strategic Alliances for Academic Sustainability and Competitiveness						x		
	Transforming the Global-ASEAN Culture, Capability and Capacity of Higher Education and Research Strategic Alliances	x				x			
	Technology and Transformation of Teaching, Learning and Research Paradigms in Knowledge-Based Economy			x					
	Experiences, Learning and Sharing from Global, Regional and Intra-regional Collaborations	x							
	Quality and Institutional Research Capabilities in Higher Education		x						
2011	Academic Endeavors and Excellences		x						
	IR Responses and Responsibilities	x							
	Educational and Technological Advances and Applications			x	x				
	Institutional Capacities and Capabilities	x							
	Quality Tenacity and Tanets		x						
	New, Creative, Innovative and Esoteric Initiatives			x				x	
2012	Institutional research in World Class higher education	x							
	Innovation capabilities in World Class higher education							x	
	Teaching and Learning Scholarship in World Class higher education			x					

Year	Subtheme	Institutional Research and Development	Quality Assurance and Management	Teaching and Learning	Education Technology	Society and Culture	Education Sustainability	Creativity and Education	Education and Industry
	Best Practices and Benchmarking World Class higher education		x						
	Culture in World Class higher education					x			
2013	Transforming Institutional Planning and Strategic Management	x							
	Enhancing Teaching and Scholarly Activities			x					
	Practicising Institutional Effectiveness: Theory, Techniques and Technologies				x				
	Assessing Student Learning Outcomes and Program Quality		x						
	Exploring Entrepreneurship and Institutional Effectiveness	x							x
2014	Development Education Models for AEC 2015	x							
	Cross-Culturalization of Higher Education Institution in AEC	x				x			
	Leading-Edge Strategies and Practical Solutions to Education Quality							x	
	Contemporary Problems in Education: Exploring the AEC Boundaries			x					
	Education and Authentic Human Development for AEC		x						
2015	Managing of Internationalisation and Inclusivity of teaching and learning towards students' success			x					
	Achieving Internationalisation and Inclusivity through teaching technologies				x				
	Improvement of institutional and academic quality through Internationalisation and Inclusivity		x						
	Realising Internationalisation and Inclusivity through Institutional Research	x							
	Accomplishing Internationalisation and Inclusivity through effective institutional management		x						
2016	Executing Teaching and Learning Engagement			x					
	Institutionalising academic and social engagement	x				x			
	Empowering Technologies for Academic and Social Engagement				x	x			
	Discovering Institutional Research in Examining Academic and Social Engagement	x				x			
	Augmenting Quality Practice to Ensure Academic and Social Engagement		x			x			
	Enhancing Social Engagement through Service Learning					x			
2017	Investigating the Revolution of Educational Models, Policies, and Practices: New Magnitudes	x							
	Applying the Innovative Teaching, Learning, Assessment Techniques, and Technologies: New Scales			x				x	
	Implementing the Rigorous Academic Curricula: New Perspectives		x						
	Enhancing the Institutional Effectiveness and Academic Quality: New Dimensions		x						
	Re-focusing the Student Experience and Engagement: New Enrichments			x					
2018	Competency and Employability as the Focus of Teaching and Learning			x					

Year	Subtheme	Institutional Research and Development	Quality Assurance and Management	Teaching and Learning	Education Technology	Society and Culture	Education Sustainability	Creativity and Education	Education and Industry
	Technology as Enabler of Teaching and Learning			x	x				
	Quality Assurance of Students' Capacity and Capabilities		x						
	Institutional Management of Students' Efficacies and Effectiveness	x							
	ASEAN and Institutional Agenda for Students' Integration and Mobility	x							
2019	Quality Assurance: Practices, Impacts and Outcomes		x						
	Advanced Technology and IR Application: Social Networks, Data Warehousing and Data Collection				x				
	Institutional Governance: Enrolment, Social Mobility and Higher Education Accountability	x							
	Teaching Dimensions and Possibilities: Innovations, Performance and Assessment			x					
	Research Institutionalisation: System, Dissemination and Utilisation	x							
2021	Teaching, Learning, and Quality Assurance		x	x					
	Education Governance, Culture, and Values	x				x			
	Inclusive and Multidisciplinary Curriculum		x				x		
	Educational Technology and Innovation				x			x	
	National Education Agenda	x	x						

Not surprisingly, all conferences address the first group of the criteria and ensure that the conference subtheme not only align with the conference's theme but is also in line with the direction and core values of the Institutional Research. This is also depicted in Figure 2, where the highest the first three criteria represent the highest occurrence of the analyses. The design of the conference theme and subthemes is the result of the discussion between the host university's Local Organising Committee (LOC) and the SEAAIR Executive Committee. Hence, conferences must set the theme based on the needs of the university or country and adhere to the direction of SEAAIR.

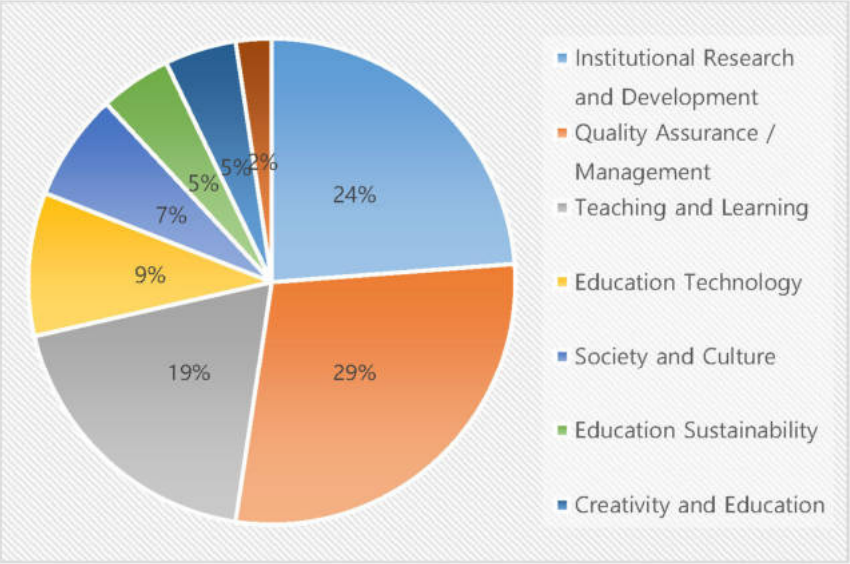

Figure 2: Distribution of the measurement criteria for Annual SEAAIR Conference Subthemes.

Education Technology is defined as creating, using, and managing technological resources and processes to facilitate learning (Robinson, Molenda, & Rezabek, 2008). The institutions of higher learning have changed from using just overhead projectors in the early days to using various technologies such as computers, projectors, smart boards, or even virtual meeting environments. Hence, the importance of understanding and applying the education technology has become one of the topics that need to be addressed by the universities. This criterion is ticked in conferences from 2015 – 2021 continuously.

Some of the subthemes address more criteria. For instance, "Empowering Technologies for Academic and Social Engagement" in 2016 covers Education Technology and Society and Culture criteria. For example, Thailand, in their four times of hosting the conference, suggested subthemes crossing two criteria. The subthemes were designed to combine one criterion from the SEAAIR core objectives, and other criteria from the other group. Such combination led the delegates to focus on the main business, and at the same time, expand the research area to complement the core business. The university also invites a more diverse discussion through the subtheme, leading to the potential multidisciplinary research collaboration.

The subtheme of the 21st Annual SEAAIR Conference presented a different way of categorisation, which may be due to its main theme that relates to diversity. Hence, the subtheme was designed to include as many criteria as possible. Each of the subthemes is covered by two criteria. For instance, "Teaching, Learning, and Quality Assurance" covers both criteria of "Quality Assurance and Management" and "Teaching and Learning". Such an arrangement allows the coverage of more topics within the comfortable number of subthemes of the conference.

Discussion

In the ASEAN Context, the conference leaves its presence in six out of ten countries in the ASEAN member countries. Four universities are listed in the Times Higher Education (THE, 2022), while only two were listed in QS World University Rankings (QS, 2022). This lays the potential barrier for SEAAIR's venture into the Bruneian university and promoting the Institutional Research in the country. The fresh market in Brunei may also be seen as a potential opportunity for future SEAAIR conferences to be organised in Brunei and have the Bruneian culture introduced to the world. On the contrary, Cambodia, Laos, and Myanmar are relatively less developed or low-income countries (World Population Review, 2022), so either the institutional research or hosting a conference may not be the university's priority. Therefore, SEAAIR may consider connecting with Brunei to create awareness in Cambodia, Laos, and Myanmar. Such establishment may be achieved through the publicity of the current members and the call for conference notification sent to the universities.

Based on the analyses performed on the themes, the host country designs the conference theme based on the local development related to the government policies, socio-economy development, or future planning. Table 4 describes the highlight or keywords of the conference themes based on the observation of themes for conferences held from 2003 to 2021.

Table 4: Conference theme keywords/highlights for Annual SEAAIR Conferences 2003 – 2021, categorised by countries.

Country	Keywords / Highlights
China, Indonesia	Entrepreneurship
Malaysia, Thailand	Education Quality, Education Sustainability
Philippines	ASEAN Movements
Vietnam	Internalisations, Inclusions
Singapore, Taiwan	Implementation, Actions and Challenges

Such categorisation may provide a guideline for the host universities to understand the trend created from the past conferences and how they may design their themes based on the contemporary nation development and the direction of the host university.

SEAAIR's core research area is based on the three main pillars: Institutional Research and Development, Quality Assurance and Management, and Teaching and Learning for post-secondary education. It is essential for the host university to ensure that the conference's subthemes are closely tied to these three pillars, so researchers will be addressing these research areas, leading to knowledge sharing and further strengthening the foundation of Institutional Research in the region. From the current analyses of 16 conferences, the subthemes not only complement the main theme and covers SEAAIR's main research pillars but also suggest additional topics that may be of the host university to elaborate the conference theme further.

Of the 15 conferences, three-quarters of the conferences proposed five subthemes to complement the main theme. The number of subthemes not only manages to cover all necessary topics but also does not leave researchers with too many confusing choices of topics. When the conference is organised with too many subthemes, the host university may be facing an issue of a low volume of submission in certain subthemes, leading to the subtheme not being able to be well addressed through the research outputs.

Conclusion and Future Works

This paper discussed the conference themes and subthemes of Annual SEAAIR Conferences from 2001 to 2021. The analyses revealed the relatedness of the conference theme based on the country's contemporary educational or socio-economic development, which can be categorised based on the host country and the important key phrases. Majority of the conferences have five subthemes to support the conference themes, provided a clear guideline to the researchers to gear their research output in line with the conference theme. In two decades, SEAAIR engaged six out of ten ASEAN countries in hosting the conferences and extended their connection to China and Taiwan to fly the flag of SEAAIR in other Asia countries.

Hence, this paper provided a guideline for the future conference host universities to understand the development of the past Annual SEAAIR Conferences and critical pointers in designing conference themes and subthemes.

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The Assessment of Non-Formal and Informal Educational Standard

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ABSTRACT

The purpose of this research is to analyze the strengths and weaknesses of the development guidelines for educational management in preparation for the assessment of non-formal and informal education centers. This research is qualitative research and a documentary analysis. The populations are the authorized education evaluators and the designated education administrators. The instruments used for data collection included structured interview and content analysis. The result of the research indicated that 1) the strengths were knowledge enhancement, activity design, knowledge application and the integration with local wisdom to manage the classroom management while the weak points were the integration of technology with the teaching and result assessment process 2) the development guidelines for educational management process should be focused on the application of technology to the teaching and the reading promotion. Furthermore, the adjustment of the assessment criteria should be focused on student achievement indicator, the adjustment of the assessment method by implementing empirical evidence on the student achievement and to develop the online assessment to minimize the risk of COVID-19 transmissions.

Keywords: Educational Standard, Non-Formal Education, Informal Education

Introduction

The non-formal education is an education that aims to provide the target group to improve their lives and society by the principle of organizing the education for lifelong learning. In other words, the non-formal education gives the opportunities to the underprivileged who lacked the educational opportunities in the school system. They have the opportunity to acquire the knowledge, the practice skills, and cultivate the necessary attitudes for the life as well as being able to adapt to the changes of technologies that are rapidly advancing happily as they should be (Niyomves, 2020). Furthermore, the operations of the educational centers are located throughout Thailand that encourages the people to have access to learn the resources throughout their lives. The operations of the non-formal and informal education centers will focus on the participation in developing the projects and activities setting by schools setting. They also determine the change of the participation that the villagers are in charge of the development project (George E.Urch, 1984). In addition, Srinivasan (1989) stated that the instructional design was used by a variety of formats, contents and various medias and constantly open to the ongoing innovation. The most content center guidelines are: the transfer of specific knowledge identified by experts to learners. According to Boonwatthanakul (2016), the target group of the non-formal education target groups are the adolescences and adults who are mature, experienced, responsible for their careers, take care of their families, and have a lot of the limitations in learning. In order to manage the operations of non-formal and informal education centers, they aim to have the same standard of learning. The government also has required to be evaluated by the organization who are responsible for the assessment every year. The assessment model can be divided into 3 standards as follows:

1) Based on the non-formal education standards for basic education levels, it can be defined as the education organized not less than twelve years before the higher education that is an assessment of the quality of learners. Moreover, the quality of non-formal education at the basic education level focuses on the child center as well as the management quality of the educational institutions.

2) The ongoing education standards can be defined as the education aims to response the needs and the necessity of the ongoing education, for example, the vocational training. In addition, the ongoing education also evaluates the quality of the ongoing learners, the quality of the ongoing education learning management and the management quality of the educational institutions.

3) The standard of informal education can be described as the education does not have the fixed pattern. In other words, there are no fixed courses and durations, most of which are organized by the public libraries and the learning media support. Moreover, they are as follows: the quality of the informal education service recipients, the quality of educational management and the management quality of educational institutions

Also, the educational institution should manage the results of the reporting are via writing a report according to the specified criteria that is sent through the relevant agencies. Furthermore, the assessor will appoint an appraiser committee to evaluate the educational institution. Based on the pandemic of Covid 19, to begin with, the assessment agency must adjust the assessment format to be assessed through solely the written reports and report the evaluation towards the educational institution. There is a request from the education center will then be re-evaluated via the online. Although, there is solely the assessment via the document analysis, the assessment agency is responsible for the assessment developing the educational center and construct the ability to evaluate the organization and resolve the knowledge gap of the assessment (Chaudhary & al. 2020) As well, the development of the educational institutions in writing performance reports also can concisely perform the results of operations.

In conclusion, the educational institution has commented on the model of the assessment management that does not see the real context of work. It solely see the report of the school. In addition, the school evaluators saw the weaknesses of the schools through the performance reports. Therefore, the misunderstandings of the standard evaluation of the of the non-formal and informal education in Thailand are the significance of this study

Objectives of the study

1. To analyze the strengths and the weaknesses concerning non-formal and informal education centers

2. To analyze the guidelines for enhancing the educational management procedure to prepare for the assessment of the center for non-formal and Informal education.

Methodology

1. Research Methodology

This research is the qualitative research and the documentary analysis. In the initial stage, the researcher analyzed the format of reporting on the educational management outcomes based on the established standards. Next, the in-depth interviews were conducted in accordance with the educational institution assessors with school administrators in order to affect the development guidelines of the educational institutions in educational management to meet the specified standards.

2. Population

The population in this study were as follows:

2.1 The ten officially appointed school assessors were selected from the part of the assessors who were registered and those were selected to be evaluated at the same educational institution.

2.2 The five educational institution administrators were assessed by the educational institution standards from the recommendation of the educational institution assessors.

3. Instrument

In this study, the instrument was conducted as follows:

3.1 An interview form with a formally appointed school evaluator was selected by interviewing the strengths and weaknesses of the assessment and investigating the development guidelines based on the non-formal education standards at the basic education level, the standard of the ongoing education and the standard of the informal education.

3.2 An interview form with a formally appointed school evaluator was selected by interviewing the strengths and weaknesses of the assessment and the development guidelines based on the non-formal education standards at the basic education level, the standard of the ongoing education and the standard of the informal education

4. Data Collection

In this study, the data were collected as follows:

4.1 The self-assessment reports of 10 non-formal and informal education centers were analyzed to scrutinize the strengths and the weaknesses of the school self-assessment reporting

4.2 The interview was conducted with a formally appointed school evaluator, the strengths and the weaknesses of the assessment criteria as well as the educational institutions

4.3 The interview was conducted with the administrators who were assessed by the school standards, the strengths ,the weaknesses of the assessment criteria, and the educational institutions who were assessed.

4.4 The summary of the study

5. Data Analysis

The researcher summarizes the data from the interview results. The information from the document was analyzed from the conduct content analysis and was categorized according to the issues created and interpret to find the linkage of the data. It was verified the accuracy of each informant.

Findings

The assessment criteria for educational institutions can be divided into 1) The non-formal education standards at the basic education level, 2) The continuing education standards, and 3) The informal education standards. All of these 3 standards must be assessed in 3 aspects: firstly, the quality of the learners, secondly, the quality of the learning management, and thirdly, the quality of the school management. The findings were as follows: 1. The quality of the learners 2. The quality of the knowledge management 3. The quality of the educational institutions. The findings of the research were as follows:

1. The analysis of the strengths and weaknesses of non-formal and informal education centers based on the results of educational management with the specified standards

1.1 Informal education standard for fundamental education

Strengths The educational institutes implemented a variety of method for learners' development by promoting higher student learning achievement. There was the development in analysis thinking, learner creativity, life skills, social skills and Sufficiency Economy Philosophy. Additionally, the educational institutes established the network partners and received a successful cooperation. Its achievement was used to improve the learners and publicized to relevant parties via websites and meeting.

Weaknesses The educational institutes were not able to present the continuous higher student achievement result during the past three- year development plan, compared to the aimed target value. Even though the learning manager were able to organize all the training courses as planned, but the technology was not involved in the knowledge management to maximize the benefit.

1.2 The continuing education standard

Strengths The trainer designed the learning activities, short-term and long-term vocational training courses by combining the local wisdom and all the knowledge resources in the provinces. There was

the development for learning tools and the training results. The knowledge from training were adopted to perform the job function efficiently. Lastly, the learners' satisfaction was assessed to evaluate the effectiveness of learning design.

Weaknesses Although the educational centers had the community network, but the intellect and learning resources management were not transferred. Additionally, the learners' satisfaction assessment report was not clear enough. The learners' satisfaction assessment report should include the learning factors and the learning management process.

1.3 The in-formal education standard

Strengths The activities were designed and implemented as planned. Learning resources and local wisdom were coordinated. Reading promotion included library, learning centers, mobile library unit and community library. Other learning activities were organized to attract the readers to use these facilities. Customers' satisfaction assessment was executed and all educational institutes reported the operational outcomes and suggestions from the educational institutes committee and personnel for continual improvement.

Weaknesses The curriculum development and learning management were promoted in variety methods to respond to the learners and community needs. However, modern tools, library development process and mixture of activity development were missing. Lastly, satisfaction assessment and the assessment results lacked clear information and could not lead to improvement.

From the findings mentioned above, the overall strengths of the educational institutes were the knowledge development, the learning activity design, the promotion for knowledge utilization and the efficient collaboration with the local wisdom. On the other hand, the weak points reflected in the integration between the technology utilization and the learning process. The satisfaction assessment process and the project evaluation were also among the weak points of the educational institutes

2. An analysis of guidelines for improving education management processes in preparation for assessment of the non-formal and the informal education centers

2.1 The non-formal education standard for the fundamental education

According to the higher learning achievements of the learners considered the strong points of the educational institutes, the technological media enhancement should be further augmented. The enhancement should be focused on the lecturers, curriculum development and continuous learning management plan. The curriculum development needs to be done in according with the changing and modern technology media to enhance student-centered learning process while avoiding high budget.

2.2 The ongoing education standard

The ongoing education focused on the training and the application to the actual job function. The heart of the education was the curriculum management that serve the learners' need. The advantages were the integration between the local wisdom and the provincial learning resources. Apart from this, the learners' fundamental analysis process development, social need including present social condition included in the education would support the advantages efficiently. The learners are able to apply these knowledges and the technology usage to keep the up-to-date of the social current affairs. In conclusion, the assessment result reflected the assessment criteria clearly.

2.3 The informal education standard

The informal education focused on the project design procedures for the learners by using the learning technology. The evaluation also emphasized the activities in particular the learning library. The present technology became an essential part of everyday life and resulted in less reading habit. Developing the technological media could promote the reading habit, therefore the activity design in accordance with the new way of target group life was essential.

From the information above, the guidelines for enhancing the educational management procedure to prepare for the assessment of the center for non-formal and Informal education focused on the application of technology to the learning management, the reading promotion activities, the learners' analysis and the current requirement before training. The requirement should be in line with the educational institutes' context, whether urban or rural area.

Apart from this, the important elements that should be developed can be divided into 2 aspects 1) the adjustment of assessment criteria which focused mainly on the learners' achievement indicator and reduce the assessment which requires the paperwork 2) assessment method, onsite assessment by evaluator, the development of online assessment which allow educational institutes to present the actual operational result via online channel, for example, the online linking of learning outcomes in order to show the empirical evident and reduce the risk of physical contact during the pandemic of COVID-19.

Discussion

1. The analysis of the strengths and weaknesses of non-formal and informal education centers based on the results of educational management with the specified standards

The research findings reflected the strengths of educational institutes in the abilities to develop the knowledge, to design for learning activities, to promote the knowledge utilization and to collaborate with the local wisdom efficiently. Therefore, the learning management process were in accordance with all the specified criteria. On the other hand, the weaknesses were the integration of technology utilization and learning management, which are in accordance with the teacher survey in the fundamental schools showing the low-level basic skills in ICT usage, media literacy, ICT ethical issues (Inthira Choositong & al, 2020).

Moreover, from the educational institute administrator interview in the area of the satisfaction assessment process, the assessment result report and the report on the result of project development, the finding showed the insufficient number of lecturer and staff to complete the workload which consist of teaching planning, teaching, projects in the provincial level and other promoting projects, causing incomplete workload in every details. This finding was in accordance with the survey from the Office of knowledge society promotion and youth quality, revealing that in each year, Thai teachers' life schedule have adverse impact from external activities as many as 84 days or 42%, indicating "the assessment-academic competition-training" take teachers away from classroom the most (krooupdate, 2019).

2. An analysis of guidelines for improving education management processes in preparation for assessment of the non-formal and the informal education centers

The findings revealed that the guidelines for improvement emphasized on the utilization of technology in teaching and reading habit promotion. Apart from the improvement of assessment criteria which focused on learners as a core indicator, the improvement of the assessment method showing results, for example the number of basic learners that are able to continue study in further education or are employed with higher salary. The non-formal education is not limited to only one teaching design, but covers models, contents and a variety of media that can enhance the learning process. However, the success of the learning outcomes are likely to be evaluated from the operational outcomes (L.Srinivasan, 1989). The non-formal education cause the learners to have more technology knowledge and administration skills, resulting in higher employment opportunity in industry (Rainer H.Lehmann & Robert E.Verhine, 1982).

Suggestions

1. The educational institutes assessment should consider its location, the number of learners, the number of personnel and the budget received to comply with the assessment criteria. This is because nowadays the number of learners is reducing due to the decreasing birth rate, resulting in the activity or training implementation, including the lower budget for developing learners.

2. The learning outcomes should be the main indicator and be more focused than the operational process assessment. The reason is due to the fact that the educational institutes can have various methods and can develop the learner to produce more learning outcomes by using new strategies.

3. The analysis of learners, laborers' need in the local area and selling channel in order to promote the learners after the training will support the learning to get more benefit and the learner will also be aware of the importance of non-formal education.

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Theme II: Re-Discovering Teaching & Learning Practices & Protocols

Conversion from physical assessment to online assessment: A Case Study at the Newcastle Australia Institute of Higher Education

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ABSTRACT

In the pre-COVID era, many engineering education academics shared that engineering education is challenging to conduct through online learning. The physical assessment remains as the preferred assessment method for engineering education, as it deals with large number of calculations and drawings, and with the online assessment where the computer keyboard is the main tool in the solution of the questions, both students and educators are facing a great challenge to convert the practice into the online system. This paper presented the conversion of the assessment method from physical examination to the online examination during the Pandemic, and the evaluation of the effectiveness of the assessment based on students' performance on both physical examination and online examination. The analyses showed that students' performance remains similar despite the mode of assessment. The paper also outlined the additional steps taken to ensure the academic integrity among students. Lastly, a short discussion on the continuous improvement process was implemented to ensure that the adopted system is sustainable throughout the Pandemic.

Keywords: Face-to-face Learning, Online Learning, Engineering Education, Hybrid Learning, Hyflex Learning, assessments.

Introduction

The idea of the online learning was initiated at the beginning of the millennium but has not been given much attention as Institutes of Higher Education (IHE) were still prefer the face-to-face learning, which was believed to be more effective, (Pham & Ho, 2020). Notwithstanding the preference, IHE were forced to convert the face-to-face learning to online learning following the lockdown due to the Pandemic in 2020, (Brakora, Day, & Choo, 2021), (Armin, et al., 2021).

The conversion form face-to-face classes to online classes are mainly the response to the tight measurements towards the COVID-19 outspread in Singapore. The first case of COVID-19 in Singapore was recorded on 23 January 2020, (Yong, 2020), and then the Circuit Breaker (lockdown) was enforced nationwide in Singapore in May 2020 to contain the spread of the COVID-19 virus in the country (gov.sg, 2020). Following this, the COVID-19 (Temporary Measures) Act 2020 was released to enforce people's movement restrictions (Singapore Statues Online, 2020). During this period, schools and IHL had to implement the Home-based Learning (HBL) through the online learning.

The Circuit Breaker ends 1 June 2020, where businesses are reopened and students are allowed to resume the face-to-face classes with tightened safety measurements, (Abu Baker, 2020). The recovery from the Circuit Breaker is divided into three phases, where Phase 1 started from 2 June 2021, Phase 2 started on 19 June 2021 and Phase 3 started on 28 December 2021. All phases come with various measures of relaxation of movements, including on how students attend classes in schools.

In the early days, students access to the online Learning Management System (LMS) mainly to obtain the lecture notes and assessment items, and lecture recordings are relatively not as important as the other recourses, as students have attended the lectures, and have obtained the assistance of the understanding towards the course through the lecture, (Grabe & Christopherson, 2008). The lockdown is a new ballgame to all education providers, and everyone was given a very short timeframe to get climatised with the new learning environment.

The studies of (Castillo-Merino & Serradell-López, 2014), (Lorenzo-Alvarez, Rudolphi-Solero, Ruiz-Gomez, & Sendra-Portero, 2019), (Soesmanto & Bonner, 2019) and (Brakora, Day, & Choo, 2021) also shows that the students' results are not affected by the conduct of the online classes. The conduct of such dual mode systems has also provided a flexibility to the IHEs to cater for both on-campus and off-campus students who may have different requirements and reasons to attend face-to-face or online lectures. (Castillo-Merino & Serradell-López, 2014) commented that students' motivation is the main factor to determine the progress on the online learning. On the other hand, the regression study by (Lorenzo-Alvarez, Rudolphi-Solero, Ruiz-Gomez, & Sendra-Portero, 2019) on radiology course revealed that the students' GPA is the main influence of the performance of the online course, where students with higher GPAs showed a better performances in the online courses, as compared to students with lower GPAs.

In line with arguments by (Castillo-Merino & Serradell-López, 2014), (Roman & Plopeanu, 2021) hypothesised that the education lockdown induced a physiological distress among students and hence the education process, and the mode of learning in the future. The study also suggested that students who have family problems and inadequate space at home are less effective in their progress, and these students would still prefer face-to-face classes compared to online classes. Furthermore, students who thinks that lecturer plays an important role in their learning shows a less effective performance during the online learning.

This paper is presented in two parts. The first part is descriptive, where the process of conversion is described, and the observation notes from meetings, and notes from the Program Coordinator, who is

also the lead person in the project for conversion from face-to-face to online assessment. The second part is a quantitative analyses where students' results of a few selected courses were compared for face-to-face assessment and online assessments.

The Conversion from Physical Assessment to Online Assessment

The Newcastle Australia Institute of Higher Education (NAIHE) has been using Blackboard as the LMS, which was then switched to Canvas in 2021. During the circuit breaker, classes are conducted through Blackboard Collaborate, which is common in many IHE (Soesmanto & Bonner, 2019). As the academics are familiar with Blackboard Collaborate, the transition from face-to-face to online teaching was smooth.

The examination was scheduled in April 2020. Despite this was a month before the Circuit Breaker, this also prepares the university community to face the forthcoming trimesters where all assessments were to be conducted online. The decision of making the examination online was in March 2020, however, since the examination paper has been set and approved (for physical examination), it was proposed that

a. The examination papers are released as a document in Blackboard at the designated exam start time.

b. The Blackboard Collaborate sessions were held, where students needed to be present during the session for attendance and to facilitate any queries.

c. Students needed to scan their completed solution and upload the solution to Blackboard upon completion.

d. Additional 30 minutes was provided to students for scanning and upload process.

e. Students are informed that where this exam mark exceeds their progressive assessment marks by more than 15%, they might be called to sit an oral exam.

A dry run of the examination was conducted on 31 March 2020 for students in Bachelor of Mechanical Engineering to understand the potential issues of the exam, and at the same time, to provide students a practice of the examination to enhance the familiarity. Students were given two revision questions to be completed in 30 minutes. Based on the feedback from students, a complete Online Examination Guideline was prepared and sent to students to prepare them for the examination. In addition to this, a special Consultation session was created to answer students' queries of this running, to fully prepare students on the running of the examination.

On the examination day, students were required to log in to Blackboard Collaborate while doing the examination. Both Lecturer/Course Coordinator and Program Coordinator were on the Blackboard throughout the examination period, playing the role as facilitator and invigilator. The use of the Collaborate brings the convenience of

- Raising questions – queries were raised through the platform and could be answered immediately

- Solving technical issues – the Program Coordinator who was experienced in the system could help solving the problem.

- Taking attendance – the list of attendance could be easily downloaded from the attendance list in Blackboard Collaborate.

All students were requested to access to collaborate, and due to the potential bandwidth issue, students were not required to have the webcams on. They were only requested to turn on the webcam before the examination to confirm the location and presence.

Analyses of Operational Performance

The Setting of Examination Paper

For the examination conducted in April 2020, since there was no confirmation of what is "happening" on students' side, minor modification was done to reduce the possibility of students able to obtain the solution clue to the examination paper. Some of the suggestions and analyses of the modifications are explained in Table 1.

Table 1: Suggestions of minor modification to Examination paper in April 2020

Modification	Observation
Prepare more questions in the question bank, and then randomly choose the question from bank for students	As more questions are prepared, further approval of examination paper will be required as part of the quality control. To achieve this, the lecturer would need to put in more efforts to ensure that question papers are prepared and approved in time. Randomise questions setting in the Blackboard requires special skills and arrangements, and if the lecturer did not have prior experience in this, they will face difficulties in both setting and conduct of the examinations.
Set Multiple-Choice Questions (MCQ)	This could be of much control, as the MCQ could be fully randomise in the examination setting. For engineering courses that is calculation and analyses based, this MCQ was not a good solution, as the working is needed to show the concept, and there are also times where the answers were a range rather a definite value, leading to impossibility of the preparation of the answer choices.
Replacing the numbers in questions with Student ID number	This helped in avoiding the potential scene of direct cheating. Efforts in the calculations would still need to be put in obtaining the correct answer. There was issue with potential zero input for questions due to the 0 in the Student ID number. In addition, the lecturer would also need to prepare a "solver" with either a program or spreadsheet so that the lecturer could key in the Student ID Number to obtain the correct solution, which led to additional load.

Based on these initial observations, the examination that were conducted in the subsequent trimesters were changed to open-book examination, where the questions are set based on the highest cognitive level in the Bloom's Taxonomy.

The issues faced during the examination process

The Program Coordinator (PC) dealt with the technical issues during the examination. In addition to lecturers and students, PC has the direct access to the course site as manager, and hence managed to provide technical supports to the students during the examination, leaving the lecturers to answer academic questions should there be any.

The issues faced by students during the examination were summarised in Table 2.

Table 2: Technical issues faced by students during the final examination and the steps taken to address the issue.

Issues	Observation
Students faced internet connection issues during the examination.	The PC is connected through other modes of contact (e.g., phone), and additional time were allowed for student to complete the examination.
Students were logged out from the site due to website security setting (idle for too long, or trying to refresh the site)	The PC acknowledge the information from the Blackboard and then grant student the permission to get back to the site to continue the examination.
Students submit the wrong file by accident.	The PC acknowledge the file submitted and then get student to submit the file again within a certain time frame.
Students had a big file size what was not able to be uploaded	The PC advised student to send photos to the PC immediately, then upload the files using different avenue.

The Marking Process

The examination was conducted where student answers the question on physical paper and then upload the file to the Blackboard, and hence, the marking on blackboard was not possible due to the limitation of the LMS. The lecturer needed to download the file and either mark the file as softcopy in the portable document format (pdf) or print the papers out and mark them in hardcopy.

The lecturers reported their observation which is summarised as follow.

- Students scanned the documents in Joint Photographic Experts Group format (.jpeg) and then zipped the document. The lecturer needed to unzip the file and the print all pictures to mark.
- Some scanned documents were too dark due to dim lighting, and they found it hard to read the solutions.
- Some documents were taken from far, where students' keyboard, pen, cups, and other unnecessary objects were in. The scanned space was not fully utilised.
- Some students had their solution done in half a page, and then they only scan half a page, leading to the resolution of the scanned document become inconsistent when mixing with other pages which were scanned in full.

Students' Performance Analyses

Students from Bachelor of Mechanical Engineering (Honours) programme from the NAIHE are selected to observe such conversion. The aim is to show that students who took the online assessments should have the same performance to those who took the face-to-face assessments.

showed consistent academic performance under the online learning condition. To demonstrate such performance, the comparison of the student performance of Thermodynamics for 2019, 2020 and 2021 were compared. Students attended face-to-face lectures in 2019 and online lectures in 2020 and 2021.

The following hypothesis is established as the criteria of measurement: "There is no significant difference in academic performance for students who attempt the face-to-face assessment and online assessment"

The sample courses were chosen based on the condition that they are taught in face-to-face manner in 2019, and online manner in 2020 and 2021. In addition, there is no change in the assessment components and lecturers who were teaching in the course to eliminate potential variables in the analyses. Hence, it is assumed that all content and assessments were identical, with only the delivery and learning mode were changed from face-to-face to online. All assessments, including class tests and final examinations in 2020 and 2021 were conducted through online mode. Table 3 shows the total enrolment of students in the course in the three years for each of the course.

Table 3: Enrolment number for different courses for years 2019, 2020 and 2021

Year	Fundamental of Engineering Mechanics (Level 1)	Engineering Fluid Mechanics (Level 2)	Engineering Thermodynamics (Level 3)	Heat Transfer (Level 3)
2019	40	43	40	40
2020	21	22	36	32
2021	26	26	28	28

Table 4 shows the mean and standard deviation for the marks obtained by students from 2019 to 2021. The mean obtained by the cohort that went through the online learning is similar those who went through the face-to-face learning.

Table 4: The mean and standard deviation for the marks obtained by students for face-to-face teaching (2019) and online teaching (2020, 2021).

Year	Fundamental of Engineering Mechanics (Level 1)		Engineering Fluid Mechanics (Level 2)		Engineering Thermodynamics (Level 3)		Heat Transfer (Level 3)	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
2019	63.10	20.25	62.49	19.78	61.72	18.07	62.04	18.11
2020	67.89	13.63	61.99	19.10	64.90	15.79	64.44	16.62
2021	61.54	24.46	62.20	17.51	63.49	19.10	64.44	13.36

Normality test is performed to determine the null hypothesis for this research, where the face-to-face teaching (2019) and online teaching (2020, 2021) was performed through the two-sample *t*-Test assuming unequal variances at the 95% level of confidence. Table 5 to Table 8 shows the t-Test scores for face-face teaching and online teaching for Students in all courses. The results show no significant different between the scores of the two tests ($p > 0.05$) and hence the hypothesis is accepted.

Table 5: t-Test scores for face-face teaching (2019) and online teaching (2020, 2021) for Students in Fundamental of Engineering Mechanics.

	2019	*2020*	*2019*	*2021*
Mean	63.1	67.88535	63.1	61.53846
Variance	409.9513	185.777	409.9513	598.3585
Observations	40	21	40	26
t Stat	-1.09509		0.270754	
P(T<=t) two-tail	0.278249		0.787792	
t Critical two-tail	2.004045		2.012896	

Table 6: t-Test scores for face-face teaching (2019) and online teaching (2020, 2021) for Students in Engineering Fluid Mechanics.

	2019	*2020*	*2019*	*2021*
Mean	62.48721	61.98959	62.48721	62.19923
Variance	391.3976	364.9941	391.3976	306.6259
Observations	43	22	43	26
t Stat	0.098173		0.062999	
P(T<=t) two-tail	0.922241		0.949984	
t Critical two-tail	2.015368		2.001717	

Table 7: t-Test scores for face-face teaching (2019) and online teaching (2020, 2021) for Students in Engineering Thermodynamics.

	2019	*2020*	*2019*	*2021*
Mean	61.7218	64.89636	61.7218	63.48849
Variance	335.0696	256.3134	335.0696	378.2002
Observations	40	36	40	28
t Stat	-0.80643		-0.37766	
P(T<=t) two-tail	0.42258		0.707114	
t Critical two-tail	1.992543		2.003241	

Table 8: t-Test scores for face-face teaching (2019) and online teaching (2020, 2021) for Students in Heat Transfer.

	2019	*2020*	*2019*	*2021*
Mean	62.04125	64.43831	62.04125	64.43679
Variance	328.1282	276.1595	328.1282	178.4421
Observations	40	32	40	28
t Stat	-0.58425		-0.62745	
P(T<=t) two-tail	0.56096		0.532527	
t Critical two-tail	1.994945		1.996564	

With the successful implementation of the hyflex teaching and online assessment, such practice has been taken in place until 2022, and both students and academics have been living in the norm of such practice. 2022 marks the ease of the restriction, where most of the country's boundaries are opened, and students are returning Singapore from their home countries. The practice remains as the default practice until all students are back in Singapore, and NAIHE will review the current practice to decide if this is to be continued, or a new conduct is to be implemented.

Despite the online assessment reveals that there is no dropping in the academic performance, there are still questions that yet to be fully understood. Students' soft skills, which is equally important, is not being observed, or properly measured through the online assessments. For instance, based on the report published by (NTUC, 2022), 58% of the employee felt that communication is an important critical core skill to have. Despite there are presentation assessment that could be done through the online platform, but the academics could not be entirely provide constructive feedback to the students on the presentation skills, hence delay the learning of soft skills.

The online assessment is conducted based on the full trust that students are doing the examination on their own and there is no external communication at all during the examination period. To achieve this, all examination questions have been set as open-book examinations, to minimise the chances where cheating happens. In addition, the post-examination oral examination is held to further conduct oral examination if the lecturer suspects if there is a potential cheating. The effectiveness of such approaches is still yet to be fully researched, and the IHE is not able to confirm that if the online assessment will one day be replacing the face-to-face assessment.

Due to various internet connection speed in various countries, some students find it challenging and pressurising to take the online examination, especially when the internet connection was bad and they have problem in downloading the questions, or uploading their solutions, which lead them not able to pay full concentration in answering the questions. As a results, students still prefer face-to-face assessment, especially the examination since they can pay a full focus on the paper during the stipulated examination period, and there is no need to worry about scanning and uploading the papers.

Conclusion

This paper presented the conversion from face-to-face teaching to online teaching for the Newcastle Australia Institute of Higher Education to address the COVID-19 Pandemic in the region. The conversion process was successful thanks to the cooperation provided from both academics and students, and continual review process was in place to ensure that the practice was consistently applicable based

on the current situation of the country. There was no significant difference in the academic performance between students who did the face-to-face classes and students who attended the online classes. The results show the possibility of converting from face-to-face teaching to online teaching, which can be done, even in a short duration, thorough application of different strategies of solving this complex problem, proving the 10,000-hour rule outlined by Gladwell (Gladwell, 2008).

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Problem-Based Online Learning through Multidisciplinary Studies to Enhance Chemistry Literacy and Improve Environmental Awareness

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ABSTRACT

Chemistry learning struggled with its biggest barriers during the Covid-19 pandemic which only can be executed online. The barriers are distance and quality of internet connection. They increase students' anxiety about chemistry learning that requires critical and scientific thinking to solve the problems. Further, online learning is still the best practice for new normal education. On the other side, distance education should be able to encourage students actively participate in pandemic survival by following the health protocols based on their environmental awareness. The research aims to describe multidisciplinary studies as fundamental for problem-based online learning to enhance chemistry literacy and improve environmental awareness. Purposive sampling defines the respondents, they are the students who followed 4 months full course of online general chemistry learning. Data is qualitative from students' answer sheets of structured interviews and be analyzed descriptively according to the literature reviews. Data also includes video assessment to analyze the students' ability of chemistry content creation to describe their scientific thinking. The findings describe that multidisciplinary studies enrich students' knowledge and perspective to explore the chemicals surrounding them. They develop much wider and deeper learning experiences which drive students to become more aware of the quality of their living environment. The research concludes that problem-based online chemistry learning needs to be supported by multidisciplinary studies to draw attention wider and deeper so students can enhance chemistry literacy and improve their environmental awareness.

Keywords: New Normal Education, Problem-Based Online Learning, Crititical and Scientific Thinking

Introduction

Chemistry education has its complexity which is commonly assumed by students as the conceptualization of their experiences of the physical world (Taber, 1998). It is related to distinguishing the representations of aspects of an individual's cognitive structure, and general models which are intended to reflect commonalities from the representations derived from several individuals (Lakoff & Johnson,1980). For example, when the teacher describes an atom as the smallest thing in any matter and made up of protons, neutrons, and electrons, then students should define it in the same way. But, in fact, some students still perceive it as the basic atom that can be divided into three parts named proton, neutron, and electron. The situation requires chemistry teachers to manage the disparity so students can make an explanation of the common framework of chemistry by driving the individual's cognitive structure through their mental organization (Driver & Erickson, 1983)

Taber (1998) describes the individual's cognitive structure as a composite picture based on ideas shared by a number of students, generalized non-individual descriptions, and thematic interpretations of data, stylized, mild caricatures of the response made by students'. The description of Taber (1998) is based on Driver and Erickson (1983) who briefly explains science as the creation of the human mind with its freely invented ideas and concepts. That is why chemistry should give wider space to students in conceptualizing their experiences of the physical world, especially related to chemicals existences in their daily life.

Limited mobilization to control the Covid-19 pandemic caused the disparity of students' framework of chemistry to become wider where students can only learn online. Online learning makes students struggle to learn because of the distance and quality of internet connection (Muilenburg & Berge, 2005) which worst the interaction quality inter students and also between teacher and students (Bacow *et al.*, 2012). Though Huang (2020) found that online learning gives the most significant benefit, lecture recordings via online software. The lecture recordings provide the capture of the teacher's presentation, class discussions, and participation as they occur, so the students can further grasp the knowledge. Another benefit of online learning is supporting the students to reduce their difficulties in mastering the subjects by watching the playback.

However, the benefit of online learning can only occur if the teachers always improve their teacher-student interaction and maintain students' interest by engaging them during online teaching. Problem-based learning is one learning approach to maximize the benefit of online learning for improving the teacher-student interaction by maintaining students' interests and engaging the students. As Savin-Baden (2007) explained that problem-based learning is characterized by situations such as organizing the focus for learning which provides the complex, real-world situations that have no 'right' answer, so students need to work in teams to confront the problem, identify learning gaps, and develop viable solutions. In the end, problem-based learning drives students to gain new information through self-directed learning.

Referring to Overton and Randles (2015) problem-based learning needs to be dynamically executed by focus enrichment such as chemistry for sustainable development. Dynamic problem-based learning enhances the students' experiences in real-life problem-solving, communication, and group working skills. Belt *et al.* (2002) emphasizes that effective problem development should be able to encourage the student's enthusiasm and interest by providing a rich source of real-life contexts so the students can create various scenarios or case study.

Multidisciplinary studies will effectively implement dynamic problem-based learning because they apply different perspectives to common topics without significant integration of those perspectives. So that interdisciplinary studies occur that increase creativity and help to foster innovation (Rasmussen, 2022). Furthermore, Rajabzadeh, Mehrtash, and Srinivasan (2022) explain that multidisciplinary studies improve students' understanding of the concepts and develop meta-skills focused on developing

deep content knowledge, fostering critical thinking, engaging in collaboration, and promoting creativity and communication skills.

The targets of this research are the first-year chemistry education students who attend distance learning from some remote (disadvantaged, leading, and outermost) areas of Indonesia. Sari *et al.* (2022) identified the condition of learning in some remote areas of Indonesia as parents' low awareness of the importance of their children's education, local teachers' low motivation, limited teaching resources at school, pupils' absenteeism, pupils' poor numeracy, and literacy skills, the principal's low responsibility, natural hazard factors, pupils' low ability to understand Indonesian, and local conflicts between different communities. The condition as Sari *et al.* (2022) identified is similar to Zaharah's (2022) findings that generally, learning did not run smoothly in Indonesia during Covid19 pandemic, because some students have difficulty participating in distance learning caused to unstable internet connections and lack of funds to purchase internet quotas, and teachers lack expertise in learning technology, especially in using learning applications.

This article aims to describe multidisciplinary studies as fundamental for problem-based online learning to enhance chemistry literacy and improve environmental awareness. The problem-based online learning applies daily-life activities and surroundings as the context of knowledge for multidisciplinary studies.

Literature Reviews

Multidisciplinary Studies for Chemistry Education

Rasmussen (2022) defined multidisciplinary studies as studies which are combining or involving more than one discipline or field of study by applying different disciplinary perspectives to a common topic but without causing significant integration of those perspectives. Furthermore, multidisciplinary studies appear to have a stronger connection to innovation because attributed to the ideas and methods that are most often transformational than when drawn from outside the discipline that developed them. Multidisciplinary studies for chemistry education increase complex problems of the realm so its effective application requires suitable training in multiple disciplines or effective collaboration between various practitioners of different disciplines.

Multidisciplinary studies for chemistry education, according to Rajabzadeh, Mehrtash, and Srinivasan (2022), provide deep content knowledge, foster critical thinking, engage in collaboration, and promote creativity and communication skills. Deep content knowledge of chemistry from multidisciplinary studies implementation achieved by involving the history and archeology of chemistry, so it develops a fosters critical thinking, and gradually, engages students in collaboration. Engaging students in collaboration which is supported by students' teaching and learning from various backgrounds' interests and motivations will promote creativity and communication skills (Srinivasan, 2022).

Further, Jones, Jordan, and Stillings (2005) stated that multidisciplinary studies for chemistry education produce a variety of knowledge products, including new evaluation instruments, websites for research or dissemination, digital videos of chemical demonstrations and experiments, a set of animations, instructional software programs, paper instructional materials, and two annotated bibliographies. Hendarwati *et al.* (2021) described multidisciplinary studies as collaborative problem-based learning that improves students' collaborative and problem-solving skills. In detail, Hendarwati *et al.* (2021) explained that the objective of multidisciplinary studies in chemistry education is constructing knowledge, looking for resolution strategies, and evaluating solutions in collaboration. Al-Thani *et al.* (2022) also found that multidisciplinary studies implementation in chemistry education develops students' research self-efficacy and fosters their research competencies based on multidisciplinary science.

Chemistry Literacy

Chemistry literacy is defined by Holbrook (2005) as knowledge and understanding gained from learning outcomes through chemistry. Simanjuntak (2020) states that chemical literacy plays a role in individual awareness and promotion of biodiversity conservation efforts to achieve sustainable development goals. Chemistry literacy is vital to enhance the capability of problem-solving in the chemical world by fully utilizing the chemical information to inform decisions that describe the development of several skills sets including gathering information, sifting and refining knowledge, aligning information with prior experience, and applying information within the context of the problem (Shultz and Zemke, 2019).

According to Parlan *et al.* (2022) findings, chemistry literacy means the ability to provide scientific explanations on related topics. This research discusses biotic and abiotic factors in an ecosystem; irritability; adaptation; evolution; food chain, webs, and pyramid; biogeochemical cycle; biodiversity; and sustainability. Chemistry literacy that has to be achieved by this research should be able to explain the chemicals' roles within those topics and synthesize the relevant knowledge to solve the problems provided by the researcher in class. So, during the course, students can solve the problems by chemistry literacy that describe the relevant context, knowledge, and competency. Furthermore, the findings of Putica and Ralević (2022) state that chemistry literacy significantly influences the achievement in chemistry learning among students, especially the reasoning capability.

Moreover, Bunce and Phelps (2006) deeply asses chemistry literacy as the applicative knowledge or practical real-chemistry related to students' interest and motivation in chemistry learning, such as finding the empirical formula of a compound or balancing an equation of the chemical reaction. They identify chemistry literacy as described by the skills of looking for information, formulating questions, organizing knowledge, classifying, relating to various representations, noticing regularity, initiating hypotheses, and conducting an inquiry.

Environmental Awareness

Wong (2003) expressed environmental awareness as opinions on environmental protection efforts and policies. Students' environmental awareness can be developed, based on Wahyuningtyas and Simanjuntak's (2020) findings, by applying the local wisdom-based learning module. Environmental awareness refers to the tendencies of feelings, values, and concerns that will motivate individuals against environmental protection and conservation, which consists of environmental sensitivity, behaviors, attention, motivation, and intention to act on environmental problems (Febriasari and Supriatna, 2017).

Budimansyah and Sopandi (2016) find that problem-based learning can improve environmental awareness by engaging students to reflect on the learning as the process of knowledge harvesting. There are three indicators of environmental awareness, based on Perkasa, Agrippina, and Wiraningtyas (2017), described as (1) contextual knowledge of environmental issues and sensitivity to related problems; (2) competence to perceive and be concerned about environmental issues and problems; and (3) organizing the relevant knowledge to solve environmental problems and contributing to environmental improvement. This research defines environmental awareness as the tendencies of feelings, values, and concerns identified by environmental sensitivity, contextual knowledge of environmental issues, and organizing the relevant knowledge to solve environmental problems or contribute to environmental improvement.

Method

The research was conducted as an environmental education course that occurred over 3 months. The research involved first-year seven students in a Chemistry Education Study Program at the Christian University of Indonesia. The students were learning from their homes located in Bekasi Region-West Java, West Nias, Bengkayang-West Borneo, East Timor, Tanah Karo-North Sumatra, and the densely populated housing of West Jakarta. In the beginning, the state of students' condition and learning motivation was similar such as lack of chemistry knowledge, low communication skill though using the Indonesian language, and average learning motivation.

The researcher is the lecturer of the course who plays some roles as the class facilitator, mentor, and learner. The course implemented problem-based online learning to explain chemicals' role within the connection between some topics related to biotic and abiotic factors in an ecosystem; irritability; adaptation; evolution; food chain, webs, and pyramid; biogeochemical cycle; biodiversity; and sustainability. The course's outcome is encouraging students to decide on some scenarios based on their identified problems to improve or preserve the environment quality. The process of problem-based online learning was executed as follows:

Step 1—Identify and clarify unfamiliar terms presented in the scenario; scribe lists those that remain unexplained after discussion. For the first step, the researcher used two pictures to show two conditions of environment quality that describe the researcher's surroundings, as shown in Figure 1 and Figure 2. Other than that, the researcher also used one picture to explain the chemicals' role that influences the environment quality. During the session, the researcher implemented multidisciplinary studies to explain the pictures by facilitating the intense discussion through various questions inter alia "How do you feel about the pictures of two environment conditions?"; "Have you ever been in those two environment conditions?"; "Can you explain the differences between living things' interactions occurred inside the two environment conditions?"; "What do you suggest to preserve the quality of the city forest or improve the quality of the slum area, referring to the situations inside the pictures?".

Step 2—Define the problem or problems to be discussed; students may have different views on the issues, but all should be considered; the scribe records a list of agreed problems. During the session of step 2, the researcher roles a play as a learner, the same position as the students to improve the quality of the problems discussed.

Step 3—"Brainstorming" session to discuss the problem(s), suggesting possible explanations on basis of prior knowledge; students draw on each other's knowledge and identify areas of incomplete knowledge; scribe records all discussion. In this session, the researcher plays two roles. First, the researcher plays a mentor to suggest possible explanations on basis of students' prior knowledge. The second role is to become a facilitator to manage the discussion so all students actively express their opinions and views so the transfer of knowledge between the students occurs during the learning progress.

Figure 1: Two conditions of environment quality

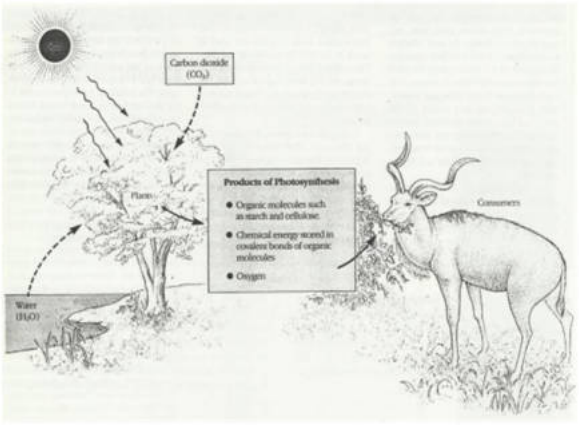

Figure 2: Interaction between chemicals and living things

Step 4—Review steps 2 and 3 and arrange explanations into tentative solutions; the scribe organizes the explanations and restructures if necessary. Continue to Step 5—Formulate learning objectives; nine students as a learning group reaches consensus on the learning objectives; tutor ensures learning objectives are focused, achievable, comprehensive, and appropriate. Step 4 and Step 5 were gradually executed for each student one at a time. They play two roles as speakers and facilitators to explain their topics related to biotic and abiotic factors in an ecosystem; irritability; adaptation; evolution; food chain, webs, and pyramid; biogeochemical cycle; biodiversity; and sustainability. During the sessions of Step 4 and Step 5, the researcher plays a mentor and a learner at the same time.

Step 6—Private study (all students gather information related to each learning objective). This session is the moment for students to write and reflect on the topics that they already presented in Step 4 and Step 5. The reflection moment was supported by each session record so the students can replay the record to deeper comprehend the discussion. At the end of the course, Step 7—Students identify their learning resources and share their results then recap their written reflections as a book series of environmental education based on a chemistry perspective. In this final step, the researcher checks learning and may assess the worksheet.

Result and Discussion

In the beginning, it was not easy to conduct problem-based online learning because the students cannot find the importance of learning environmental education, since they want to be chemistry teachers after finishing their studies in the Chemistry Education Study Program. This is why the starting point began with some reflective questions to frame the basis of students' prior knowledge related to chemistry learning. Each student gave the expected answers but they still struggled to frame the knowledge to explain the chemicals' role in influencing the quality of the environment.

However, the students cannot give the expected answers to suggest actions to preserve the quality of the city forest or improve the quality of the slum area. The researcher found that the picture cannot describe the students' surroundings so the distance between students and the problems is too far. Immediately, the researcher realized the situation and then change the question with a direction to ask students to show a picture that describes their surroundings as described in Figure 3 and Figure 4. The decision of changing the question with direction is referring to Overton and Randles (2015) that

problem-based learning needs to be dynamically executed by focus enrichment, so it can enhance students' experiences in real-life problem-solving, communication, and group working skills. During the problem-based online learning, the researcher engages students to reflect on the learning as the process of knowledge harvesting to improve environmental awareness (Budimansyah and Sopandi, 2016; Febriasari and Supriatna, 2017).

Continuation of Overton and Randles' (2015) findings, Belt *et al.* (2002) emphasize that effective problem development should be able to encourage the student's enthusiasm and interest by providing a rich source of real-life contexts so the students can create various scenarios or case studies. The decision of changing the question with direction in Step 1 affects the students' interests and enthusiasm in Step 2 and Step 3.

The result of Step 2 and Step 3 shows that the student who presents Figure 3 can explain that Nias' traditional house is constructed without nails, and is earthquake resistant. She was able to explain the chemicals' role in influencing the quality of the traditional house, especially the kinds of woods that are used in the construction. They have to use special kinds of wood to build one traditional house and need 4 years to finish it. She even can give a satisfactory answer to her friend's question "Can we use a machine to short the time of building a traditional house?" She answered that the machine will damage the contours of the land which is a coastal area and also waste a lot of money to handle the machine. This explanation is in line with Budimansyah and Sopandi, 2016; Febriasari and Supriatna, 2017; and Perkasa, Agrippina, and Wiraningtyas (2017) that the student expresses her tendencies of feelings, values, and concerns that motivate her against environmental protection and conservation, which consists of environmental sensitivity, behaviors, attention, motivation, and intention to act on environmental problems.

The same condition with the student who proposes Figure 4. She is used to the phenomenon and believes that the eruption will increase the fertility of the land so they can harvest higher in the next season. Even though they are very afraid of the eruption and experienced very sad situations for a long time before the eruption ended. From generation to generation told that the eruption means nature is trying to heal herself to balance human activities and become healthier to afford living things' needs. Further, she also explained the synthetic fertilizers used for farming should be balanced with the organic ones to prevent another disaster. These situations emphasize the findings of Jones, Jordan, and Stillings (2005) who stated that multidisciplinary studies for chemistry education produce a variety of knowledge products. The variety of knowledge products describes chemistry literacy as explained by the findings of Shultz and Zemke, 2019; Parlan et al. (2022); Putica and Ralević (2022).

Figure 3: Traditional House of North Nias

Figure 4: The Eruption of Sinabung Mountain, Tanah Karo-North Sumatra

Result for Step 4 and Step 5 show all students' proficiency in describing the chemicals' roles within the connection between the topics related to biotic and abiotic factors in an ecosystem; irritability; adaptation; evolution; food chain, webs, and pyramid; biogeochemical cycle; biodiversity; and sustainability. They explained that machines using fossil fuels can contaminate the land and the coastal area which bad influence on living things and the noise will disturb and harm birds as well. Deeper, they understand that a traditional house-building ceremony takes a long duration to give time for other living things to adapt to human activities so that harmony can exist gradually.

For the last step, Step 6 and Step 7, all students perform similar ability to synthesize the information from online media as their paper works in describing and explaining the chemicals' roles in influencing the environment related to biotic and abiotic factors in an ecosystem; irritability; adaptation; evolution; food chain, webs, and pyramid; biogeochemical cycle; biodiversity; and sustainability. An example of the synthesis such as "Adaptation will occur if biotic factors respond to changes in abiotic factors, so it can be interpreted that the conditions that affect the occurrence of adaptation are irritability and change". As Rajabzadeh, Mehrtash, and Srinivasan (2022) explained that multidisciplinary studies improve students' understanding of the concepts and develop meta-skills focused on developing deep content knowledge, fostering critical thinking, engaging in collaboration, and promoting creativity and communication skills.

Overall, each student is happy with their achievements during the problem-based online learning. Even though the works are individual assignments, they can work as a team to result better and comprehend deeper (Hendarwati *et al.*, 2021). Further, they also criticize the information they get from online media or the researcher's statement during the discussion. They can accept the different points of view though they can agree on one condition that a sustainable environment is our common responsibility. Before closing the course, the researcher asks students' opinions to conclude the topics, and they express the same impression that everything we have done to the environment will directly affect our quality of life (Simanjuntak, 2020; Al-Thani *et al.*, 2022).

Apparently, a higher quality of students' achievements from the implementation of multidisciplinary studies as the fundamental for problem-based online learning in chemistry education mostly depends on the proficiency of the educators in role-playing along each step. The situation is in line with Ramussen's (2022) statements that effective application of multidisciplinary studies requires suitable training in multiple disciplines or effective collaboration between various practitioners of different disciplines.

Conclusion

Generally, the implementation of multidisciplinary studies as the fundamental for problem-based online learning in chemistry education requires a high-quality of teacher's or lecturer's proficiency in role-playing to gain students' higher achievement. The minimum requirement that should be done by the teacher or lecturer is fluently communicating with a wider perspective and interdisciplinary thinking. The focus of problem-based online learning is strighly on student-centered learning for better achievement, especially in students' ability to critically think, and synthesize information which drives active discussion, and proficiency in presentation skills.

Overall, each student is happy with their achievements during the problem-based online learning. Even though the works are individual assignments, they can work as a team to result better and comprehend deeper. Further, they also criticize the information they get from online media or the researcher's statement during the discussion. They can accept the different points of view though they can agree on

one condition that a sustainable environment is our common responsibility. Before closing the course, the researcher asks students' opinions to conclude the topics, and they express the same impression that everything we have done to the environment will directly affect our quality of life.

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A Study of Adult Learners in Taiwan Community Universities on Grit and Learning Engagement: Psychological Capital and Learning Empowerment as a Mediator

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ABSTRACT

The purposes of the current study were to explore psychological capital and learning empowerment as a mediator among the relationship grit and learning engagement of adult learners in Taiwan community universities. A total of 481 valid questionnaires were collected through snowball sampling. The major instruments for this study include "Grit Scale", "Psychological capital Scale", "Learning Empowerment Scale" and "Learning Engagement Scale". Structural equation modeling (SEM) and bootstrapping techniques were employed in data analysis. Results indicated that psychological capital and learning empowerment functioned as mediators between perseverance of effort (PE), consistency of interests (CI) and learning engagement of adult learners in Taiwan community universities. Overall, the findings highlight the importance of these two psychological constructs and suggest that lifelong education institutions should provide learning environments that support these factors to ensure adult learners success.

Keywords: community college adult learners, grit, learning empowerment, learning engagement, psychological capital

Introduction

Since Taiwan's first community college was established in 1998, there have been 89 community colleges and over 400, 000 adult learners, creating a trend of lifelong learning and citizen practice in Taiwan (Ministry of Education, 2018). The majority of community college adult learners are highly motivated by their desire to learn. According to Chang et al. (2008), learning itself involves more than intellectual involvement, and the importance of experience reconstruction and community participation should be highlighted as well. As learners go through the learning process at community colleges, they can put self-awareness into practice. Furthermore, they progress from intellectual maturity to personality maturity. As a result, humans are able to have unlimited possibilities when learning is part of their everyday lives (Tsai, 2003).

Over the course of my ten years of research and teaching at the community college, I witnessed the lively classroom interaction between teachers and learners and discovered that motivated learners expect advanced courses to be available. The phenomenon I observed could be explained by the three concepts of grit, consistency of interests (CI) and perseverance of effort (PE) proposed by Duckworth et al (2007). Furthermore, her study in 2021 revealed that the specified model cannot be distinguished from any model with two correlated subfactors (Duckworth et al., 2021).

Psychological capital, which includes hope, self-efficacy, optimism, and resilience, has been proven to be a mediator between grit and academic performance. Additionally, it was also verified to be associated with the improvement of grit and academic performance (Luthans et al., 2018). However, there has been little research into the relationship between perseverance and psychological capital thus far. When it comes to the relationship between perseverance and self-efficacy in psychological capital, Alhadabi and Karpinski (2019) discovered that "perseverance of effort" and "consistency of interest," which belong to grit, had positive effects on goal orientation and test scores separately via self-efficacy.

In terms of the relationship between grit and learning engagement, Hodge, et al. (2017) discovered that grit (perseverance and interests) correlated positively with engagement (vigor, dedication, concentration), which greatly resembled Robinson's finding (2015). Furthermore, in Robinson's (2015) study, "perseverance" was found to be a critical grit factor that predicted Filipino teenagers' participation in activities and their flow. According to Suzuki et al. (2015), grit is an important predictor of work and academic performance. Yoon et al. (2018) demonstrated that grit can substantially contribute to learners' perseverance, autonomy, and specific strategies for learning activities in the Flipped classroom.

Datu et al. (2018) investigated Filipino high school students and discovered that participants' psychological capital in T1 could predict their academic engagement and achievement in T2. Furthermore, every dimension of psychological capital was positively associated with academic performance; "psychological capital" mediated the relationship between positive emotions concerning learning and academic performance (Carmona-Halty et al., 2018).

Hart et al. (2007) supported conceptualizing empowerment as a type of motivation that arose not only from internal learners' characteristics but also from situational factors triggered by teachers. Empowerment in learning entails allowing students to actively participate and choose what they learn, as well as involving them in fascinating topics derived from real-world problems. Throughout the process, their internal motivation was elicited, and they were obsessive about their learning actions as well. It was worth noting that the learners' autonomy extended to how they set their goals as well as how they produced, presented, and evaluated their learning outcomes (Chen, 2022). It was proposed that learning is an evolutionary process in which human behaviors and internal cognitive structure change as a result of activities and experiences. The influence of socialization on learners would

gradually grow as learners who were motivated to participate actively, interacting with teachers and peers (Snyder, 1971); after a period of time, the progress of learners' intellectual and personality maturity would emerge on some items of evaluations (Pike et al., 2011).

Based on previous research, it is assumed that grit predicts learning engagement in community college learners and that this relationship is mediated serially by psychological capital and learning empowerment. According to studies, those who received training on engaging in learning and related actions would have a stronger belief in pursuing future goals, and they would be able to persevere when difficulties arose, leading them to overcome and reengage in learning itself. This highlights the fact that how learners perceive and estimate themselves determines their motivation and general attitude toward learning. In other words, self-perception and self-esteem are the two key cognitive and affective factors that contribute to the formation of learning value (Chen et al., 2017; Goldsmith et al., 1997)

Little research has been conducted on the serial mediate effect of "learning empowerment" and "learning engagement" when grit is used to predict academic achievement. However, Caz and Posner's (2019) findings in organizational leadership revealed that leaders from various backgrounds would exhibit various empowering behaviors. Additionally, leaders' grit cultivated in a non-working environment would make these leaders more willing to delegate authority over work-related matters.

Methods

Participants

The samples of this research are community college adult learners in Taiwan who were invited to answer questionnaires. The process lasted for two months. A total of 481 individuals (26% male, 74% female; Mage = 54.3 years, SD age = 12.3, age range = 22-85 years) participated in this study. (Table 1).

Table 1: Demographic variables

Characteristic	Levels	Number of students	Percentage
Gender	Male	125	26
	Female	356	74
Education	Elementary & junior high school	24	5
	Senior high school	130	27.2
	College & university	260	54.4
	Graduate school	64	13.4

Measures

Grit scale

A 9-item Chinese version Grit Scale was applied in the current study. This Grit has been found to be valid and reliable in assessing universities and community colleges students' Grit in Taiwan (Chen, 2022). The Grit includes two subscales, which are perseverance of effort (PE) (6 items), consistency of

interests (CI) (3 items) (Duckworth, 2009). Four-point Likert scales are reliable and valid, and the coefficient alpha .88 and .88. The method of Confirmatory Factor Analysis (CFA) was utilized and the results of model indicated that the model is considered satisfactory (RMSEA= .008, CFI = .97, NNFI = .96).

Psychological capital Scale (PsyCap)

A 12-item Chinese version PsyCap Scale was applied in the current study. This brief PCS has been found to be valid and reliable in assessing universities and college students' PsyCap in Taiwan (Chen, et al., 2017). The PsyCap includes four subscales, which are hope, optimism, resilience and self-efficacy (Luthans & Youssef, 2007). Four-point Likert scales are reliable and valid, and the coefficient alpha ranged from .80~.85. The reliability of PsyCap in this study was .93.The method of Confirmatory Factor Analysis (CFA) was utilized and the results of model indicated that the model is considered satisfactory (RMSEA= .009, CFI = .98, NNFI = .98).

Learning Empowerment Scale (LeEm)

To measure learning empowerment were used from Frymier et al. (1996) and You (2016). This study adapted the work of Frymier et al. (1996). Confirmatory factor analysis was conducted, and the model fit indices were CFI = 0.97, NNFI = .95, RMSEA = 0.08, which indicated adequate model fit. The sample items of subscales were meaningfulness (6 items) (e.g., 'It is valuable and meaningful to study at the community colleges', Cronbach α = .94), and competence (4 items) (e.g., 'I believe that I have the ability to achieve the goals set by the course.' Cronbach α = .91). The reliability of learning empowerment in this study was .94.

Learning Engagement Scale (LeEn)

Learning engagement scale was adapted by Fredricks et al. (2004) and Reeve & Tseng (2011), reflecting adult learners' commitment to educational activities in and out of class within an institution. Learning engagement scale was divided into 4 subscales. The "behavior engagement (4 items) " item is to evaluate the students' ability to properly arrange their own learning progress, the "emotion engagement " (13 items) item is to evaluate the students' enjoyment of learning together with the social university class, and the "cognitive engagement " (5 items) to the degree of dedication and commitment to the course learning, The "agentic engagement" (7 items) item is to evaluate the interaction of students with classmates and teachers in the classroom. Four-point Likert scales are reliable and valid, and the coefficient alpha ranged from .71~.95. The reliability of learning engagement in this study was .96. The method of Confirmatory Factor Analysis (CFA) was utilized and the results of model indicated that the model is considered satisfactory (RMSEA= .08, CFI = .96, NNFI = .95).

Data analysis

The descriptive statistics and correlations were estimated using the IBM SPSS 21 program, and composite reliability (CR) and average variance extracted (AVE) were used to prove the reliability and validity of the measurement model. A structure model was used to explain the relationship and effect among the latent variables. Structure equation modeling (SEM) was estimated using the maximum-likelihood method in the AMOS 20 and LISREL 8.8.

Results

Goodness-of-model fit

The results showed full support for the first hypothesis (H1) as the path from PE, CI to PsyCap was significant, suggesting that having a hope, optimism, resilience and self-efficacy can contribute to an individual's psychological quality and the improvement of learning engagement. Regarding the second hypothesis (H2), that PsyCap has a significant effect on learning empowerment. Concerning the third hypothesis (H3), that learning empowerment affects learning empowerment. The fourth hypothesis (H4) concerns the effects of PE, CI on learning engagement. The fifth hypothesis (H5) concerned the relationship the PE, CI to community college adult learners' learning engagement. The correlations among study variables are presented in Table 2. As expected, inter-correlations showed that PE was positively associated with CI ($r = .69, p < .001$).

Measurement Model

Suggested by Anderson and Gerbing (1988), CFA is appropriate to identify whether a measurement model provides an acceptable fit to the data. Once an acceptable measurement model is developed, the structural model can be tested. A test of the CI measurement model resulted in a relatively good fit to the data ($\chi^2 = 215.55$, df = 59, GFI = .94, CFI = .98, NFI= .98, RMSEA = .07). Composite Reliability (CR) of latent variables ranging from .78 to .92, AVE ranging from .47 to .72, both CR and AVE fit the standard suggested by Fornell and Larcker (1981) and Hair et al (2010). A test of the PE measurement model resulted in a relatively good fit to the data ($\chi^2 = 398.23$, df = 98, GFI = .91, CFI = .98, NFI= .97, RMSEA = .08). Composite Reliability (CR) of latent variables ranging from .78 to .92, AVE ranging from .47 to .72, both CR and AVE fit the standard suggested by Fornell and Larcker (1981) and Hair et al (2010).

Therefore, all of the latent variables were adequately operationalized by their respective indicators. Also, correlations among the independent latent variables, the mediator latent variable, and dependent latent variables were all statistically significant ($p < .001$, see Table 3).

Table 2: Correlation and descriptive among related variables.

	1	2	3	4	5	6	7	8	9	10	11	12
1. PE	1											
2. CI	.69	1										
3. SE	.69	.55	1									
4. Hope	.66	.61	.76	1								
5.Resilience	.69	.60	.72	.78	1							
6. Opt	.71	.62	.70	.77	.81	1						
7. Meaningful	.57	.65	.47	.55	.52	.56	1					
8. Confidence	.58	.59	.56	.57	.53	.55	.74	1				
9. Emotions	.47	.51	.43	.51	.46	.49	.57	.58	1			
10. Cognitive	.39	.46	.34	.42	.37	.39	.58	.54	.48	1		
11. Agentic	.41	.37	.35	.37	.33	.35	.34	.48	.49	.33	1	
12. Behavior	.43	.43	.46	.40	.38	.40	.49	.61	.47	.53	.50	1
M	3.24	3.33	3.24	3.37	3.28	3.33	4.23	4.15	4.16	4.18	3.44	4.07
SD	0.44	0.46	0.46	0.47	0.47	0.49	0.59	0.62	0.67	0.64	0.91	0.68
skewness	.33	.39	.33	.26	.30	.08	-.32	-.18	-.48	-.23	3.89	-.48
Kurtosis	-.66	-1.09	-.09	-1.36	-.44	-.80	-.33	-.59	.17	1.18	46.47	.33

Note. All values of correlation were significant ($p < .001$).

Table 3: Factor loadings for the measurement model

Factor & Item	Standardized factor loading	*t*	AVE	CR
Perseverance of effort (PE)			.55	.88
PE1	.74	18.36		
PE2	.72	17.63		
PE3	.76	18.97		
PE4	.73	18.06		
PE5	.77	19.28		
PE6	.71	17.23		
Consistency of interests (CI)			.72	.88
CI1	.75	18.52		
CI2	.90	24.32		
CI3	.88	23.55		
Psychological Capital (PC)			.75/.76	.92/.93
Self-Efficacy	.82/.83	---		
Hope	.89/.88	23.89/24.08		
Optimism	.88/.89	23.90/24.44		
Resilience	.88/.89	23.58/24.25		
Learning Empowerment (LeEm)			.75/.74	.86/.85
Meaningfulness	.85/.83	---		
Competence	.88/.89	22.74/22.26		
Learning Engagement (LeEn)			.47/.47	.78/.78
Emotions	.73/.73	---		
Cognitive	.69/.68	13.98/13.79		
Agentic	.59/.59	11.94/12.03		
Behavior	.72/.72	14.56/14.59		

Note: All standardized coefficients representing factor loading are significant ($p < .001$).

Structural modeling analyses for testing mediated effects

The learning engagement of these community college adult learners was found to vary significantly across their learning empowerment, psychological capital, consistency of interests, or perseverance of effort. To mediate the relationship between students' PE or CI and learning engagement, psychological capital was assumed to be significantly related to engagement. Results of path analysis were identical for the full model. As shown in Figure 1 & 2, the model reveals that the effects of community college adult learners' PE or CI were found to have direct effects on psychological capital, learning empowerment, and learning engagement, the most influential of which was on psychological capital (β = .84/.73, $p < .01$), followed by learning empowerment (β =.37/.48, $p < .01$), and learning engagement (β=.00/01, $p > .05$). The effects of psychological capital on learning empowerment (β =.37/.40, $p < .01$)

were found to be positively significant. Furthermore, the indirect effects of psychological capital on learning engagement were positively and not statistically significant (β=.07, p > .05), and the indirect effects of learning empowerment were found to be positively significant related to learning engagement (β=.84/.86, p < .01). Table 4 and 5 displays the direct and indirect effect coefficients and mediated effects for learning engagement.

After the structural modeling analyses was carefully examined, the bootstrap procedure was used to test whether or not the indirect effects were statistically significant for the mediation effect in the study following Shrout and Bolger (2002), who suggested using the 95% Confidence Interval (CI) for the estimation of the indirect effects, from which, if the estimation does not include zero, it can be concluded that the variable is statistically significant at the .05 level. In the present study, we have multiple mediating variables that correlate with each other, referred to as parallel mediation (Chen, Hung, & Yu, 2019; Hayes 2013).

Table 4: PE Direct and indirect effect coefficients and mediated effects for learning engagement

Path	**coefficients**	95% CI
PE→PsyCap	.84***	
PsyCap → LeEm	.40***	
LeEm → LeEn	.84***	
PE→PsyCap → LeEm → LeEn	.52***	.43~.62
PE→ LeEn	.00	
PE→ LeEm	.37***	
PsyCap→ LeEn	.07	

Note: *** p < .001

Table 5: CI Direct and indirect effect coefficients and mediated effects for learning engagement

Path	coefficients	95% CI
CI→PsyCap	.73***	
PsyCap → LeEm	.37***	
LeEm → LeEn	.86***	
CI→PsyCap → LeEm → LeEn	.45***	.37~.56
CI→ LeEn	.01	
CI→ LeEm	.48***	
PsyCap→ LeEn	.07	

Note: *** p < .001

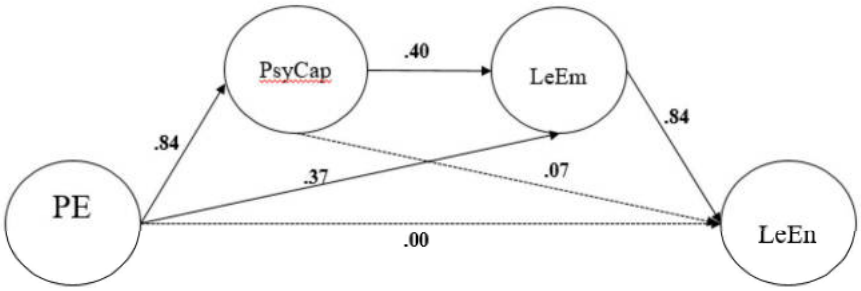

Figure 1: Full model for PE to learning engagement structural modeling analyses

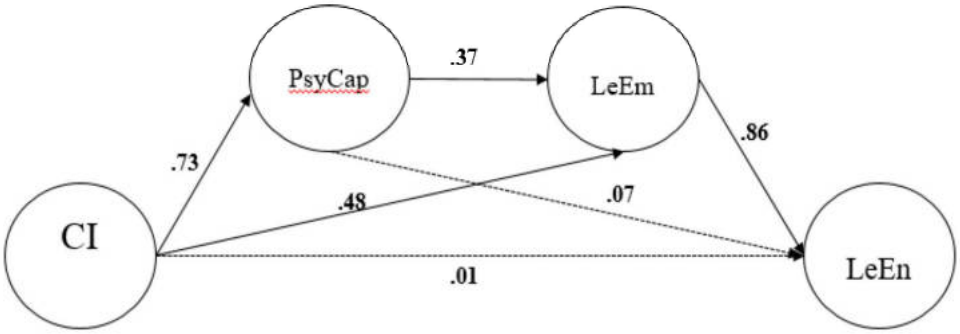

Figure 2: Full model for CI to learning engagement structural modeling analyses

Discussion

Based on the suggestions from previous research, this study investigated the influences of grit on learning engagement of adult learners in Taiwan community universities. The findings of the research echoed You's (2016) research and revealed that the higher their psychological capitals, the better their learning engagement. Positive psychological resources represent a positive mental state, which includes self-efficacy, optimism, hope, and resilience, and these crucial factors are dynamic and correlate to positive outcomes (Luthans, Youssef, & Avolio, 2007). Second, the findings of the research echoed Luthans et al. (2018), PsyCap has in mediating the relationship between grit and academic performance.

However, previous studies have not explored PsyCap and learning engagement separately in PE & CI with learning engagement. This study fills the above gap, and the research hypothesis is established.

Limitations and Future Directions

Advanced statistical methods were used in this study to analyze the survey responses of community college adult learners to determine how grit is associated with learning engagement. Care should be taken not to overgeneralize the results. First, they demonstrated some statistically significant associations, these should be interpreted as correlational rather than causal relationships. In addition, the use of survey questionnaires entails potential errors arising from self-selection effects, test environment, and participants' states of mind during the survey. Furthermore, based on the literature

reviewed, adult learners learning engagement is a complex phenomenon that involves a plethora of factors. This study explored the relationships between some major factors (i.e., PE, CI, psychological capital and learning empowerment) and adult learners learning engagement. However, the study is by no means comprehensive. Other important factors, such as gender, personal disposition (e.g., hopefulness, positivity, persistence), should be considered in future research.

Future studies should address whether different academic disciplines have varying effects on learning engagement, performance, and outcomes. In terms of methodology, the adoption of mixed-method designs is recommended as they allow researchers to explore participants' internal processes through qualitative methods (such as individual and focus group interviews) as well as study trends and interrelationships of variables.

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Artivism, Art for Social Transformation (Visual Analysis of Student Curated Artworks)

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ABSTRACT

Artivism is the power of art for social transformation. It aims at exploring new artistic forms to express various social conditions. In this descriptive exploratory study, 87 curated students' artworks utilizing the artivism strategy were analyzed using Feldman's model of art criticism. Data that were generated from the questionnaires were analyzed quantitatively and qualitatively. Descriptive statistical techniques were employed. The scores were viewed in the form of mean scores. The frequencies were used to determine students' critical ability through artivism engagement. Because this is an exploratory study, the sample was considered a case and not a representation of the population from which the findings can be inferred. In this study, the students were given the activity on artivism as one of the creative engagement activities in teaching art appreciation and contemporary issues. The students' artivism output was also graded. The perfect score was 20, and the lowest score was 17. The correlation between students' social transformation engagement and art critical ability scores was determined using Pearson Correlation Coefficient. The findings focused on students' performance in the critical analyses among the four dimensions assessed. In the context of the student's social engagement and critical ability, findings established the relationship between their art critical ability and social transformation engagement.

Keywords: artivism, social transformation, art criticism

Introduction

Artivism (a blending of art and activism) has emerged as a global language. It evolved from urban and graffiti art and situationism, all of which were creative forms from the twentieth century (Ardenne, 2008; Abarca, 2017; Szmulewicz, 2012). Teaching at the tertiary level, specifically in general education, help teachers explore the ability of students to develop their artistic ability concerning the social realities around them. There are almost a lot of strategies that teachers utilize to enhance students' artistic and critical knowledge at the same time. In teaching art appreciation, for instance, they are exposed to art activities and criticism, among others. Through the process of art criticism, students are given the opportunity to examine their work and those of others to make a systematic judgment about it.

Meanwhile, tertiary students addressed the meaning and significance of their work right after being exposed to the hybrid form of art and activism utilized by the teachers as having an educational potential and a new way of achieving social engagement using innovation and artistic creation. Artivism is a new paradigm that integrates art criticism and social transformation through artistic empowerment.

Therefore, the study intends to engage students in artivism through artistic engagement. Using Feldman's method of art criticism – description, formal analysis, interpretation, and judgment, students evaluated their artivism experience. The following questions are addressed:

1. What is the students' art critical ability in the artivism engagement regarding the artwork's description, analysis, interpretation, and judgment?
2. Is there a significant difference in the students' critical ability in the artivism engagement in the different categories?
3. Is there a significant relationship between students' art critical ability and their artivism engagement?
4. What social relevance is reflected in the students' curated artworks?

Art as Activism

Camus, the French Philosopher, states that it is not surprising that intellectuals and artists have been considered the first victims of modern tyrannies, whether of the Right or Left. Tyrants know there is an emancipatory force in the work of art, which is mysterious only to those who do not revere it (Camus, 1961). In this statement, one thing that unmistakably validates the impact of visual media and arts upon society is how they are managed by those who want to gain domination. Art is a unifying element. Tyranny, on the other hand, separates. The human mind is susceptible to the persuasive power of images. In many instances, many artists believe in the influence of art on humankind. As Camus puts it, the aim of art is the aim of life. This statement can only be the realization of freedom and responsibility seen in every man and the world. And no amount of force has to suppress man's freedom.

In teaching art, having students engage in artistic activities without letting them get in touch with the world's actual conditions while stimulating their imaginations may be an aimless pursuit. Art can become an aimless enterprise. Art has to remain rooted in societal realities. And art must also be a celebration of the beauty of the unity and harmony of the human being with the surrounding world.

It is said that the language of artivism is multiple and generative. It does not respect fixed rules. In the work of Abarca (2016: 5), this author pointed out that the unregulated nature of the practice of artivism

among urban artists ignores the limits dictated by private property that determine where they can or cannot act. This practice is not similar to how artivism is utilized in the classroom. A work of art can simultaneously cover two or more contiguous surfaces belonging to different owners. Then, in this context, it ignores the division of matter and space restricted by money. This concept is, however, applied in urban art.

Art can change people's minds. It also inspires them to take on different perspectives and reimagine their worlds. The way an artist expresses is their ability to change the individual psyche profoundly and undeniably. In artivism, it is the artist's business to change the collective mind and shy away from presently employing art. Artists with activist aims, like activists, must examine their work's efficacy in inspiring the change they imagine.

Feldman model (1970)

According to Subramaniam, Hanafi, & Putih (2016), before 1970, only the text Feldman, entitled *Becoming Human Through Art*, showed a method for the criticism and evaluation of works of art. In the study of art appreciation in art education, textbooks designed for art teachers revealed some theoretical statements about art criticism and evaluation. This framework can also be utilized in some other subjects at the tertiary level. Including criteria or standards for evaluating works of art was very brief (Clark and Hurwitz, 1975).

To understand his theory, a thorough reading is needed. In this theory, Feldman (1982) shows that he believes the student first examines the art object for thematic and utilitarian values before description. The student can look for the "pervasive quality," or style, of the artwork. Then, the student searches for cues to categorize information about the art object. Feldman's philosophy includes four areas of style: factual accuracy, formal order, emotion, and fantasy. In this manner, the student begins associating the work with one of the four abovementioned styles.

The Feldman system of criticism utilizes an inductive process to infer conclusions (generalities) from a set of available evidence (particulars). Feldman's model of criticism has served as a model in four stages for making statements about a work of art. Teachers of art appreciation have used it with the underlying premise that students who master this method can think and talk intelligently about art. Feldman believes that if students can think and talk intelligently about the art, they will know and like it better (Feldman, 1982).

Discussing art is considered integral to the necessary experience and Interpretation of the work of art. Feldman stresses the relevance of Interpretation in the explanation of the artwork. Feldman stresses that "in the process of Interpretation, challenges may arise. It is basically the most significant part of the critical activity. In order to explain the work of art, discovering its meanings and also discussing the relevance of its meanings to people's lives and to the present human condition in general" (Feldman, 1982, p. 476).

Below is Feldman’s method of criticism model for the students to use in art-critical performance.

In this framework, it has to be noted that the students may utilize Feldman’s framework to refer to their artwork in the context of activism.

Figure 1: Feldman's Formal Analysis Framework

Description

This phase is the first step in Feldman's framework for critiquing art (Feldman, 1994). In this stage, critics usually make criticisms or observations about what they observe. Such observations must be objective with no inferences or expressions of personal opinion. Then, the observer has to list only what is observed without using value words such as 'beautiful' or not. What is the title of the artwork? Who is the artist? When was the work created? What elements of art have you observed in the artwork? What are the qualities of the artwork you observed?

Analysis

This phase is the second step in Feldman's framework (Feldman, 1994). At this point, the art critic expresses their thoughts about the artwork's message. The analysis stage relies on the critic's knowledge of the elements of art and design principles to articulate in a knowledgeable style the information seen in a work of art. This phase also describes how the work is organized as a complete composition. The critic should ask the following questions: Identify similarities you have observed throughout the work (i.e., forms, repetition of lines, two songs in each act). How may the work be constructed or planned (i.e., acts, movements, lines)? Give some of the points emphasized in the work (i.e., specific scene, figure, movement). What is the relationship between the details that work to some parts?

Interpretation

The third step, interpretation, is the third step of the critiquing process (Feldman, 1994). The art critic expresses their opinion about what they think the artist is trying to say by describing what it means to them. This step also expresses how it makes the critic feels. What expressive qualities the artwork has? The art critic should ask questions like: Does the work remind you of other things you have experienced (i.e., analogy or metaphor)? How does the work of art relate to other ideas or events in the world or your other studies? And What expressive language (expressive) would you use to describe the qualities (i.e., tragic, ugly, funny)?

Judgment

This phase is the last step in the framework (Feldman, 1994). During this stage, the art critic expresses their opinion about the work of art. The art critic assessed whether the piece is a success or failure by asking the following questions: What criteria can you list to help others judge this work? How original is the work? What qualities of the artwork make you feel it is a success or failure? What makes you say that the work is original or not original?

Research Methodology

This study utilized descriptive research. This study made use of 87 students' artivism outputs. Artivism was done as a strategy in the class. Descriptive statistics utilized were frequency counts, percentages, mean scores, and standard deviation to determine students' art critical skills in their artivism engagement. The Pearson correlation coefficient was employed to make simple predictions as to what possible

dimensions of art criticism may correlate with students' artivism engagement. The level was set at alpha .05.

This study is exploratory. The sample was considered a case and not a representation of the population from which the findings can be inferred. In this study, the students were given the activity on artivism as one of the creative engagement activities in teaching art appreciation and contemporary issues.

The students' outputs in the artivism output were also graded. The perfect score was 20, and the lowest score was 17. Table 1 shows the distribution of students' scores in the artivism activity. The distribution is shown based on the percentage of students getting grades from grade A (Superior) to grade F (Inferior). Of 87 students, 33.3 (29) scored grade A, and only 17.2% (15) scored A-. Some students achieved grades B+ with the percentage of 26.4% (23). While 8.0% (7) of the students scored B- and 5.75% (5) scored C+. None of the students got a grade of C, D, and F grades.

Table 1: Grade percentage obtained by students in the Artivism activity

Grade	Percentage (%)
A	33.3
A-	17.2
B+	26.4
B-	9.2
C+	8.0
C	5.75
D	0
F	0

The same sample of students was also made to answer the art critical ability scale by Feldman (1994).

Having seen the general students' performance in their art criticism, it is interesting to examine this performance concerning the four dimensions according to Feldman's Model of Art Criticism: description, analysis, interpretation, and judgment. Table 1 shows the mean score of students' critical analyses exercise using the bar graphs on dimensions. The total score of each dimension is 20.

The Research Participants

The study's students are currently enrolled this second semester, 2021-2022. The researchers picked the students' names from the online class record using simple random sampling, and then their outputs were chosen for visual analysis during their engagement in artivism. Twelve other artivism outputs were done by students who opted to submit two outputs for this activity. The T distribution of the participants is reflected in Table 2.

Table 2: Profile of the Respondents

		f	**%**
Sex	Male	29	39
	Female	46	61
	Total	75	100

Results and Discussion

Students' Critical Ability in Artivism Engagement in Terms of the Artwork's Description, Analysis, Interpretation and Judgement When Taken as Whole and When Grouped According to Sex

When taken as a whole (M=4.63, SD=0.39), the students' critical ability in artivism engagement regarding the artwork's description was rated VERY HIGH when grouped according to sex. The male (M=4.70, SD=0.32) and female (M=4.59, SD=0.43) respondents also rated critical ability in artivism engagement in terms of the artwork's description as VERY HIGH.

When taken as a whole (M=4.60, SD=0.47), the students' critical ability in artivism engagement in the artwork's analysis is rated VERY HIGH when grouped according to sex. The male (M=4.70, SD=0.35) and female (M=4.54, SD=0.52) respondents also highly rated critical ability in artivism engagement in the artwork's analysis.

When taken as a whole (M=4.62, SD=0.43), the students' critical ability in artivism engagement regarding the artwork's interpretation was rated VERY HIGH when grouped according to sex. The male (M=4.71, SD=0.34) and female (M=4.57, SD=0.47) respondents also rated critical ability in artivism engagement in terms of the artwork's interpretation as VERY HIGH.

When taken as a whole (M=4.59, SD=0.44), the students' critical ability in artivism engagement regarding the artwork's judgment was rated VERY HIGH when grouped according to sex. The male (M=4.64, SD=0.43) and female (M=4.56, SD=0.45) respondents also rated critical ability in artivism engagement regarding artwork's judgment as VERY HIGH.

Table 3: Students' Critical Ability in Terms of Description, Analysis, Interpretation and Judgment When Grouped According to Sex

Sex	Mean	N	SD	Description
Description				
Entire Group	4.63	75	.39	Very High
Male	4.70	29	.32	Very High
Female	4.59	46	.43	Very High
Analysis				
Entire Group	4.60	75	.47	Very High
Male	4.70	29	.35	Very High
Female	4.54	46	.52	Very High
Interpretation				
Entire Group	4.62	75	.43	Very High
Male	4.71	29	.34	Very High
Female	4.57	46	.47	Very High
Judgement				
Entire Group	4.59	75	.44	Very High
Male	4.64	29	.43	Very High
Female	4.56	46	.45	Very High

Legend: 1-1.8 – Very Low 1.81-2.6 – Low 2.61-3.4 Average 3.41-4.2 – High 4.21- 5 – Very High

Difference in the Students' Critical Ability in Artivism Engagement in terms of the Artwork's Description, Analysis, Interpretation and Judgment when Grouped According to Sex

Results show that there was no significant difference in the students' critical ability in artivism engagement in terms of the artwork's description (U=597.000, p=0.428), analysis (U=576.500, p=0.307), interpretation (U=621.000, p=0.605) and judgment (U=597.000, p=0.433) when grouped according to sex. The probabilities of 0.428, 0.307, 0.605, and 0.433 are more significant than the level of significance, which is 0.05. Therefore, the null hypothesis must be accepted. The students' critical ability in the artwork's description, analysis, interpretation, and judgment does not vary when grouped according to sex.

Table 4: Students' Critical Ability in Terms of Description, Analysis, Interpretation and Judgement When Grouped According to Sex

	sex	N	Mean Rank	U	p-value	Interpretation
Description	Male	29	40.41	597.000	.428	Not
	Female	46	36.48			Significant
	Total	75				
Analysis	Male	29	41.12	576.500	.307	Not
	Female	46	36.03			Significant
	Total	75				
Interpretation	Male	29	39.59	621.000	.605	Not
	Female	46	37.00			Significant
	Total	75				
Judgement	Male	29	40.41	597.000	.433	Not
	Female	46	36.48			Significant
	Total	75				

Relationship in the Students' Critical Ability in Artivism Engagement

Between Analysis and Description; Between Interpretation and Description; Between Judgment and Description; Between Judgment And Analysis; Between Judgment And Interpretation; And Between Interpretation And Analysis

Results of the study show that there was a strong positive relationship between analysis and description

(rs = 0.794, p=0.000); between interpretation and description (rs = 0.790, p=0.000); between judgment and description (rs = 0.762, p=0.000) of students' critical ability in artivism engagement. The probability of 0.000 is less than the significance level, which is 0.05. Therefore, the null hypothesis must be rejected. The analysis, interpretation, description, judgment, and description of students' critical ability in artivism engagement are significantly related.

Table 5: *Significant Relationship in the Students' Critical Ability in Artivism Engagement Between Analysis and Description; between Interpretation and Description; Between Judgment and Description*

		Description		
	r_s	**p-value**	**Description**	**Interpretation**
Analysis	.794**	.000	Strong Positive	Significant
Interpretation	.790**	.000	Strong Positive	Significant
Judgment	.762**	.000	Strong Positive	Significant

**. Correlation is significant at the 0.01 level (2-tailed).

Results show that there is a very strong positive relationship between analysis and interpretation (rs = 0.862, p=0.000) ; between analysis and judgement(rs = 0.821, p=0.000); between judgement and description (rs = 0.762, p=0.000) of students' critical ability in artivism engagement. The probability of 0.000 is less than the significance level, which is 0.05. Therefore, the null hypothesis must not be accepted. The analysis, interpretation, and judgment of students' critical ability in artivism engagement are significantly related.

Table 6: *Relationship in the Students' Critical Ability in Artivism Engagement Between Judgement and Analysis, and Between Interpretation and Analysis*

		Analysis		
	r_s	p-value	Description	Interpretation
Interpretation	.862**	.000	Very Strong Positive	Significant
Judgement	.821**	.000	Very Strong Positive	Significant

**. Correlation is significant at the 0.01 level (2-tailed).

Results show a strong positive relationship between judgment and interpretation (rs = 0.857, p=0.000) of students' critical ability in artivism engagement. The probability of 0.000 is less than the significance level, which is 0.05. Therefore, the null hypothesis must not be accepted. The judgment and interpretation of students' critical ability in artivism engagement are significantly related.

Table 7: *Relationship in the Students' Critical Ability in Artivism Engagement Between Judgment and Interpretation*

		Judgment		
	r_s	p-value	Description	Interpretation
Interpretation	.857**	.000	Very Strong Positive	Significant

**. Correlation is significant at the 0.01 level (2-tailed).

Social Relevance in the Students' Curated Artworks

Otherwise known as the social impact of the transformative aspect of the artivism output, social relevance is established. This component involves translation and knowledge transformation processes (Carlile, 2004). In the artivism engagement, students were given time to express their thoughts in something creative. In this strategy, the students reflect on artivism as their way of socially communicating. A semantic mechanism is attached to the use of art to create change and social

transformation. The artivism engagement aims for the students to express themselves to transform society.

In this analysis, Feldman's framework was utilized as grounding. Gianetti (2004) suggests that activism is a form used to serve a social and educational function. In this rich way of expression, art is used to channel ideas. In these, the individual or collective artist, anonymous or identified, recovers a function of correcting a social imbalance (Gianetti, 2004). Feldman's framework generated the following social dimensions from the 87 curated artworks.

Record and communicate experience (RCE). The artwork reflects various human experiences. It is a form of communication of the artist to the world. (12/87)

A Social commentary (SC). Art can be a reflection of criticism that an artist has for society. The purpose of doing art is to foster awareness of specific social issues. (12/87)

Call to action (CA). Art can provoke people to action. A view of artwork can bring people to do something about a cause or an act to bring the people as a community. 23(87)

Enrichment of humankind. Through art, people can be enriched. The vast visual expressions transform people's lives in satisfying and exhilarating ways. (14/87)

Powerful (Political) Tool. The role of art is essential to convince people to make decisions, such as in politics, among other things. In many studies, art has been proven to be a political medium. It is used as a way of conveying powerful messages to inform society. (12/87)

Gender Sensitivity. This classification shows the artist's expression of their gender representation, characteristics, and features. (14/87)

Findings

1. The students' critical ability in the artivism engagement in terms of the artwork's description was very high when they were grouped according to sex. It was also very high in terms of all categories.

2. No significant difference existed in the students' critical ability in artivism engagement regarding the artwork's description, analysis, interpretation, and judgment when grouped according to sex. Therefore, the null hypothesis must not be accepted. The students' critical ability in the artwork's description, analysis, interpretation, and judgment does not vary when grouped according to sex.

3. There is a strong positive relationship between analysis and description, interpretation and description, and judgment and description of students' critical ability in artivism engagement. It also has a significant relationship in terms of other categories. Therefore, the null hypothesis must not be accepted. The analysis, interpretation, description, judgment, and description of students' critical ability in artivism engagement are significantly related.

4. The following dimensions noted in terms of social relevance were: Record and communicate experience. Social commentary, Call to action, Enrichment of humankind, and Powerful (Political) Tool.

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Conclusions

1. Artivism engagement reinforces the students' critical ability. It has offered the opportunity to understand themselves, others, and their world.

2. The students' critical ability in artivism engagement is not enhanced by whether they are male or female. Art is universal. The scores show students' art critical ability in the artivism engagement vis-à-vis Feldman's four elements model.

3. Students' critical ability is positively and significantly correlated with artivism engagement. Given this activity, students' knowledge of art proved their ability to create and advocate. Trying to explore artivism as a pedagogical strategy has allowed them to express themselves and how they can be able to transform their community.

4. Artivism is proven to be socially relevant in many aspects. Through their artwork, they expressed their social awareness and other expressions that showed a deep connection to themselves and the community.

Recommendations

1. Artivism leads to the reintegration of art into the social environment. This strategy can be utilized in the classroom to enrich student awareness of social issues and how they can be empowered to take a stand to address societal transformation.

2. Artivism can be explored more in the context of art and educational needs.

3. The study's results may be shared with other teachers at the tertiary level to establish and validate its value in other contexts.

4. Art is a stimulating human activity. It is also an ideal medium to be integrated with the classroom as a new form of expression, an instrument of freedom, and a channel of creativity to neutralize today's generation's political and social challenges.

5. Further studies on art criticism and artivism to generate more exciting results in other settings.

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Correlates of Pre-Service Teachers' 21st Century Skills and Mentoring Practices of Supervising Instructors in the New Normal Education

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ABSTRACT

This study determined the correlates of pre-service teachers' 21st century skills and mentoring practices of the supervising instructors among five private higher education institutions with teacher education program in Bukidnon. There were 152 pre-service teachers as respondents of the study. Descriptive-correlational was employed in this study. To gather data, there were two sets of researcher-modified survey questionnaires used. The Mentoring practices questionnaire was patterned from Hudson (2010). The questionnaire on 21st Skills were adopted from Santos, et.al, (2015) from the framework developed by P21. Purposive sampling was employed to determine the respondents. The statistical tools used to treat the data were the mean, standard deviation and Pearson Product Correlation. The findings revealed that the mentoring practices of supervising instructors in Personal Attributes, System Requirements, Pedagogical Knowledge, Modelling and Feedback and the Pre-service teachers 21st century skills on Critical Thinking and Problem Solving, Communication, Collaboration and Creativity and Innovations were always practiced. Evidently the findings indicate that there were no significant differences when the Pre-service Teachers 21st Century Skills were grouped according to profile. In addition, the findings also revealed that there is a positive relationship between the Mentoring practices of supervising instructors and the 21st Century Skills of pre-service teachers. Despite the good results from mentoring practices and 21st century skills there are still challenges that the pre-service teachers have encountered especially in the new normal education. It was then indicated from the results that when there are high mentoring practices of the supervising instructors then there are higher chances of 21st century skills application from the Pre-service Teachers.

Keywords: 21st century skills, Mentoring practices, New normal education

Introduction

Preparing teachers today requires critical examination of what it means to teach and learn in increasingly networked, technology-rich classrooms. Changing and advancing conditions in the world have caused transformations in learning and teaching environments as in several other areas. This transformation contains several elements from technological infrastructure of the schools to the teacher skills. Learners and teachers, who are the stakeholders of the learning and teaching system, are the prominent actors of this transformation especially in this time of pandemic where we are having normal education (P21st Century Learning).

In recent years, to provide active guidance for the learning processes, teachers must primarily know the learner well and plan the instruction based on the learner's traits (Melvin, 2015). This situation creates a need for 21st century teachers, who could establish a healthy relationship with 21st century learners - digital natives, know them and their characteristics and could guide them in learning and teaching processes. Responsible institutions to fulfil this need, to train 21st century teachers, are faculties of education. society. The country needs teachers who are competent in terms of culture, teachers who are talented, creative and innovative, can think critically. Technology can be used to enhance critical thinking and critical literacy skills, evaluating the legitimacy and accuracy of online content is the central part of 21st century education.

At the context of teacher education, it is more compelling to determine whether it is really preparing and molding teacher interns imbued with the necessary skills of the 21st century. Teacher Education Institutions are not exempted on this dilemma. It is constantly monitoring its progress along this endeavour. Curricular programs were recently revised to align with the needed implementation of the outcome-based education. It is on this context that there is a need to assess the skills of these pre-service teachers needed for the 21st century world.

Being the premier event for which aspiring educators are being trained, it is critical that pre-service teaching experience goes well, as it sets the stage for their future teaching career. Appropriate guidance therefore is the key during this stage of development for teachers. Without mentoring or guidance, pre-service teachers may not be ready to meet the challenges that await them in their own classrooms.

Successful mentoring contributes to the development of professional skills and qualities among pre-service teachers. In the history of teacher training institutions in Bukidnon, there is not a single study conducted to describe and to quantify the mentoring practices among the supervising instructors and the 21st century skills of their respective pre-service teachers during practice teaching exposures. It is also on this gap that prompted the researcher to conduct a study on the abovementioned variables. It is hoped that the results and findings of this study would provide baseline data which will aid various stakeholders of teacher training institutions in producing quality teachers in the future.

Statement of the Problem

This study aimed to determine the correlates of mentoring practices of the supervising instructors in the 21st century skills and Pre-service teachers' 21st century skills in the selected higher education institutions in Bukidnon during the school year 2020-2021.

Specifically, this study sought to answer the following questions:

1. How do Pre-service teachers assess the mentoring practices of supervising instructors in terms of:

1.1. Personal Attributes;
1.2. System Requirements;
1.3. Pedagogical knowledge;
1.4. Modelling; and

1.5. Feedback

2. What are the 21st century skills of Pre-service teachers in terms of:

2.1. Critical thinking and Problem Solving;
2.2. Communication;
2.3 Collaboration; and
2.3. Creativity and Innovation?

3. Is there a significant relationship between the mentoring practices of supervising instructors and 21st century skills of pre-service teachers?

4. What are the challenges encountered by Pre-service teachers in applying the 21st century skills?

Framework of the Study

This study was anchored on Experiential Learning Theory (ELT) by Kolb's (2014) which states that experience is the center of the learning process. Accordingly, mentoring is typically noted as a relationship between an experienced and a less experienced person in which guidance, advice, support, and feedback are provided. There were two key players at the center of mentoring process this are the mentor and the mentee. Both of which plays an important responsibility to some sort of competency in teaching.

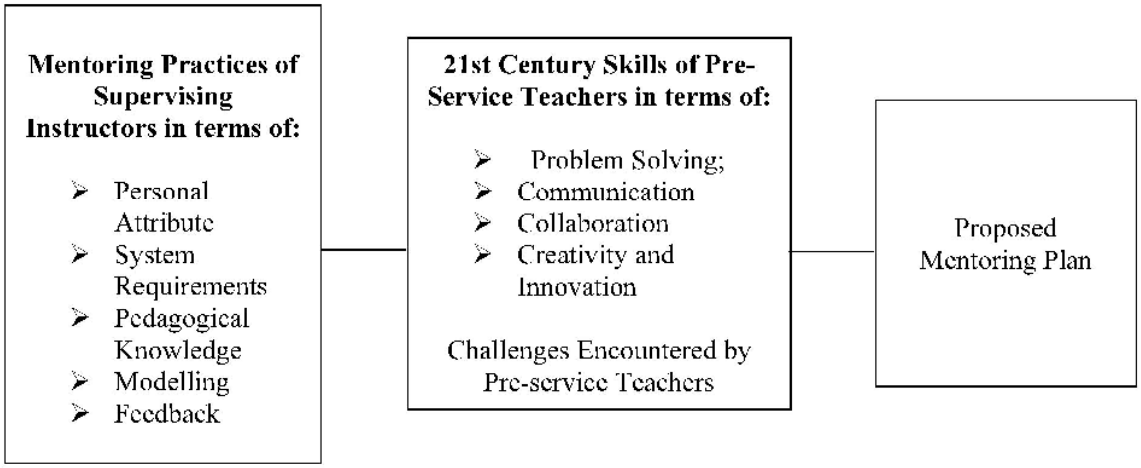
The schematic diagram of the study. The boxes represent the variables considered in the study. The 1st box contains dependent variables which is the mentoring practices of the supervising instructors on the following: *personal attributes, system requirements, pedagogical knowledge, modeling* and *feedback.*

Supervising Instructors need to consider those five factors of mentoring practices to address different mentoring circumstances during practice teaching to heighten the teaching performance of pre-service teachers. The following are the discussions on the five factors of mentoring practices. The first factor of mentoring practices is *personal attributes*. Supervising instructors who served as mentors to pre-service teachers need to exhibit a number of personal attributes to develop mentees teaching of primary education.

The second factor is *system requirements*. System Requirements present quality control directions by providing curriculum that focuses on achieving specific aims for teaching. In this area, cooperating teachers discussed school policies and classroom rules that a pre-service teacher must possess, provide pre and post conference to PST's for their awareness and define clearly the goals and objectives of the lesson prior to their teaching. Then, the next factor is *pedagogical knowledge*. This factor of mentoring practices wherein the Supervising instructors who served as mentors to pre-service teachers need to exhibit a number of personal attributes to develop mentees teaching of primary education These include being supportive to pre-service teachers, comfortable in talking about teaching practices and attentive listening to pre-service teachers concern. In *modelling*, the mentor's enthusiasm could present desirable teaching traits. Finally, the last factor of mentoring practices is *feedback*. Providing feedback allows for pre-service teachers to reflect and improved teaching practices.

For the second box, the first 21st century skill is *critical thinking and problem solving.* This is a set of skills in which the learners are curious, motivated. With real and relevant time experiences, assessing themselves is openly invigorated as an effective way to achieve their goals (P21 for 21st Century Learning, 2015). The second is *communication*, where teachers share ideas clearly and constructively, consider other ideas and perspectives and seek mutual understanding. The pre-service teachers learn to use the new modes of communication to lead in all aspects of their teaching and learning, they can be

taught the essentials of verbalizing their knowledge through open discussion (P21 for 21st Century Learning, 2015). The third is *collaboration*. The pre-service teachers work together constructively, reflect on different perspectives, build on the ideas of others, and take responsibility for their team and themselves. Building good rapport based on working in a diverse team, pre-service teachers can use their personalized tools to form better solution, and make better decisions (P21 for 21st Century Learning, 2015). The fourth 21st century Skill is *creativity and innovation*. Pre-service teachers share ideas courageously, pursue new paths of thinking, refine prototypes, and design innovative solution. With the ability to create new and innovative ideas on their own pace of learning, they are empowered to think creatively, and form their own conclusions (P21 for 21st Century Learning, 2015).



Methodology

This study attempted to determine the correlates of mentoring practices of the supervising instructors and the pre-service teachers' 21st century skills among five (5) private higher education institutions with teacher education program in Bukidnon. There were 152 pre-service teacher-respondents of the study.

Descriptive-correlational was employed in this study. To gather data, there were two sets of researcher-modified survey questionnaires used for pre-service teachers. Purposive sampling was employed to determine the respondents. The researcher takes all the pre-service teachers of the five institutions. To answer problem 1 to 5, frequency, percentage, mean and standard deviation were used. ANOVA and T-Test were also used to determine the significant differences and Pearson correlation r was also utilized to determine correlation between variables.

Results and Discussion

This chapter presents the analysis and interpretation of the data gathered from the respondents. It includes the profile of the respondents as demographic variables consisting of age, gender, course and major. It also tackles the mentoring practices of the supervising instructors and the pre-service teachers' 21st century skills.

On mentoring practices of supervising instructors

The mentoring practices of supervising instructors were analyzed. The data were obtained using the validated Mentoring Practices of Supervising Instructors Questionnaire. The data are organized according to the five factors namely: *personal attributes, system requirements, pedagogical knowledge, modeling* and *feedback* for mentoring practices.

As observed, every component was *always* practiced by the supervising instructors. The findings tell that the supervising instructors practice the five components of mentoring all the time. Among all the components, *"personal attributes" (mean, 4.50)*, *"modelling"* with mean of 4.48 and "*pedagogical knowledge*" got the highest mean. Basically, teachers are very responsive to the need of coaching pre-service teachers towards training them to become competent future educators.

As we can notice, both components clasp the importance of integrating values as well as modeling discipline for the development of the pre-service teachers which were most likely considered by their mentors. It also depicts a clear picture on how these mentors really guide, direct and monitor their mentee. Instances that would explain the finding was the outlook of pre-service teachers towards their practice teaching were some of them displayed values of being impatient. Most probably, trained teachers (mentee) are on their way of discovering and drawing out more effective strategies and techniques on how they can immediately respond and understand the stage learners are undergoing. Most importantly, they are still in the stage of collecting contextual teaching experiences coming from their respective mentors that can mold and bring their professional maturity all the way to more adaptive practices of mentoring and which they could also bring in the field where they are in.

Table 1: Summary of the Mentoring Practices in five areas

MENTORING PRACTICES	Mean	Standard Deviation	Description	Interpretation
Personal Attributes	4.50	0.72	Always	Mentoring practices is applied all the time
Modelling	4.48	0.74	Always	Mentoring practices is applied *all the time*
Pedagogical Knowledge	4.48	0.74	Always	Mentoring practices is applied *all the time*
Feedback	4.46	0.70	Always	Mentoring practices is applied *all the time*
System Requirements	4.35	0.78	Always	Mentoring practices is applied *all the time*
OVERALL	**4.45**	**0.74**	**Always**	**Mentoring practices is applied *all the time***

***Legend**: 1.00 – 1.80 (Never), 1.81 -2.60(Rarely), 2.61 – 3.40 (Sometimes), 3.41 – 4.20 (Often), 4.21-5.00 (Always)*

In general view of the responses of the participants, they have at least established a foundation of mentoring among supervising instructors since, they have undergone them on campus teaching in the laboratory school prior to their deployment to the respective schools in the Department of Education. Hence, this does not conform its consistency. Therefore, this study could help give awareness to the supervising instructors, higher authorities, and the community involved about their practices, strengths and their needs for improvements.

This study was conducted to determine the mentoring practices of supervising instructors among higher education institution with basic education curriculum. It also aimed to identify, the 21st century skills of pre-service teachers. Through this study, their 21st century skills in every component are directly documented to see its relationship. The 21st century skills pre-service teachers during their practice

teaching were actually the outcomes of practices of their mentors whether they are mentored on a certain components or not as shown and disclosed to provide awareness to all who are subjects of this study and to whom its significance is attributed.

Generally, the overall result of the standard deviation of the study indicates that mentoring was *always* practiced by the supervising teachers. The responses of the participants in all indicators of the five components are clustered towards the mean. It somehow indicates that the respondents chose almost the same value of response in each indicator.

On 21st century skills of Pre-service teachers
Table 2 presents the overall mean of 4.43 which indicates that the pre-service teachers always practice the skills. It means that they applied the skills in their teaching all the time.

The overall results indicated that collaboration is the highest among the indicators which has the mean of 4.49. Collaboration has become a 21st century trend. The need in society to think and work together on issues of critical concern has increased, shifting the emphasis from individual efforts to group work, from independence to community.

Table 2: Summary of the Pre-service Teachers' 21st Century Skills

21st Century Skills	Mean	Standard Deviation	Description	Interpretation
Collaboration	4.49	0.62	Always	Practices the 21st century skill *all the time*
Communication	4.45	0.67	Always	Practices the 21st century skill *all the time*
Critical Thinking and Problem Solving	4.40	0.67	Always	Practices the 21st century skill *all the time*
Creativity and Innovation	4.38	0.68	Always	Practices the 21st century skill *all the time*
Overall	**4.43**	**0.66**	**Always**	**Practices the 21st century skill *all the time***

***Legend**: 1.00 – 1.80 (Never), 1.81 -2.60(Rarely), 2.61 – 3.40 (Sometimes), 3.41 – 4.20 (Often), 4.21-5.00 (Always)*

The general finding is that in schools and universities, students are not often taught teamwork skills. It is posed that perhaps the best way to learn to collaborate is by collaborating. One process found to enable collaboration and teamwork skills to be taught and measured was a face-to-face collaborative work and class-wide activities (Cortez & et al., 2009).

Next is communication with mean of 4.45. This indicates that pre-service teachers are still applying this skills all the time. Communication is critical to student success. A variety of technology tools available to 21st century educators expand ability to give students fast and effective feedback, saving classroom time and accelerating student achievement (Schinkten, 2015).

It can also be seen from the results that critical and problem solving has also high response from the Pre-service teachers. The results indicate that the need for critical thinking and problem solving among Pre-service teachers should be prevalent most especially in the decision-making.

Paul and Elder (2009) claimed that critical thinking is the key to developing various intellectual traits, such a perseverance, integrity, confidence in reason, autonomy, fair-mindedness, and humility, all arguably important to the position as teachers most especially in decision-making, The result of this study explains that critical thinking and problem solving are crucial to their role in rationalizing each problem that they encountered.

Creativity and Innovation is also very necessary for the pre-service teachers to possess. Accordingly, creativity arises through the confluence of the three components; knowledge, creative thinking, and motivation. Understanding of Pre-service teachers about the goals and objectives of the school and in class and brings to bear on creative thinking

Significant relationship between the mentoring practices of supervising instructors and 21st century skills of pre-service teachers.

Using the Pearson-moment product correlation, the relationship between mentoring practices and 21st skills was identified.It can be seen from table 3 results that all the components of Mentoring practices and 21st Century Skills have significant relationships. All Pearson Correlation indicates greater than the significant level. Thus, null hypothesis was rejected. The result shows positive relationship between variables. These further implies that when there is a strong mentoring practices from the supervising instructors, then there will be high possibility of pre-service teachers' acquisition and application of 21st century skills.

In the study of Garcia (2012), to provide 21st century learning experiences, educators must see their role in a new light. Rather than conveyors of knowledge, they must see themselves as designers of learning experiences, a shift that requires them to balance the role of instructor with those of collaborators and coaches. To do so will require educators to tap into their own 21st century skills, to empower the profession to think critically and collaboratively and to elevate student voice and cultivate student agency.

Table 3: Pearson's Correlation r: Mentoring practices of Supervising Instructors versus 21st century skills of Pre-service Teachers

VARIABLES	Mean	Standard Deviation	Pearson R	*P-value*	Decision
Mentoring Practices	4.46	0.46	0.665	0.00	Reject Null Hypothesis
21st Century Skills	4.43	0.47			

***Correlation is significant at 0.01 levels (2-tailed)*

Teachers learn by reading and doing, and cooperating with other teachers as well as by looking closely at students and their work and sharing what they see To provide 21st century learning experiences, educators must see their role in a new light. Rather than conveyors of knowledge, they must see themselves as designers of learning experiences, a shift that requires them to balance the role of instructor with those of collaborators and coaches. To do so will require educators to tap into their own 21st century skills, to empower the profession to think critically and collaboratively and to elevate student voice and cultivate student agency.

The result was also somewhat related to the findings of Burke (2017), wherein she cited that great mentors produce great mentees. Thus, if the supervising instructors which serve a coach and a mentor

provide strong mentoring to the teachers then more likely there teaching performance will be enhanced, which may lead to a good 21st century skills teaching performance.

To provide 21st century learning experiences, educators must see their role in a new light. Rather than conveyors of knowledge, they must see themselves as designers of learning experiences, a shift that requires them to balance the role of instructor with those of collaborators and coaches. To do so will require educators to tap into their own 21st century skills, to empower the profession to think critically and collaboratively and to elevate student voice and cultivate student agency.

It is also very notable from the results that there is very strong positive relationships to 21st century skills and mentoring. This result implies that when the supervising instructors' models greatly, then the pre-service teachers can really learn a lot from them. Therefore, if the mentor or the supervising instructors are trying their best to teach and mentor in 21st century way, then there is a greater chance that the pre-service teachers will follow them and may able to teach also in 21st century way.

Challenges encountered by Pre-service teachers in applying the 21st century skills

From the result of the open-ended questions given to the pre-service teachers, the statements in the matrix are the top challenges encountered in applying the 21st century skills in teaching. Although the result in the previous problem that teachers always practice 21st skills, still they emphasized during the interview that they also encounter challenges during teaching-learning. This agree with the study conducted by Kim (2019), he mentioned that even necessary skills were already acquired, the learner's skills and teachers In the study of Garcia (2012), a successful pre-service teacher in the 21st century relies on teachers learning from each other to problem solve collaboratively, using technology devices to build their knowledge base, receiving coaching and mentoring services from model teachers, and being deeply involved in reflection and action. Thus proper mentoring will also result to better performance of the mentee.

Teachers learn by doing, reading, reflecting and collaborating with other teachers as well as by looking closely at students and their work and sharing what they see. From the result gathered during the interview, it was found out that the main issue and concerns that the pre-service teachers have encountered is really the *classroom management*. Accordingly, even when they mentored properly by their supervising instructors and they think that they possess the necessary 21st century skills, it is lacking when it comes to real teaching scenario. They suggested, that in order to address this issue and concern, they always believe of the experiential learning.

More experiences, means more learning. Accordingly, adjustment is also the key to proper handling of classes. Having a strategic plan to create classroom structures that kept students safe and allowed for maximum learning was necessary to their success as pre-service teachers. Generally, they believe that setting clear and direct rules, build stronger relationship, promoting student agency and implementing reward system may address the issues and concern they have encountered. The matrix below present the responses of the pre-service teachers during the interview.

Matrix 1. Challenges Encountered by Pre-service Teachers in Applying the 21st Century Skills

Theme	Significant Statements
Classroom management	- It is very hard to deal the learners - The pupils are very noisy during classes - They don't listen when the class is going on - Many are roaming around during class discussion - Some are not paying attention and very difficult to control their misbehavior
Lack of resource materials	- It's hard for me to look for resources when especially if it uses internet

	- I still find it difficult to prepare creative IM's - Scarcity of the budget to make good visual aides
Time Management	- I cannot finish the delivery of the lesson within the specified time - It's hard to prepare 2 or more lesson plan because of the time constraints - It's very difficult to prepare Instructional materials especially during straight teaching
Utilizing various methods, strategies, and techniques	- I almost have the repeated methods of teaching - Cooperative Learning/ Group work was overused - It's very difficult to employ various strategies which will cater the diversity of learners - Differentiated instruction is still a struggle - giving different learning activities to suit the diversity of learners
Grading and evaluating activity or performance	- Making rubrics for performance evaluation is very challenging - Paper and Pencil Test is still common assessment tool

The second is the new environment. Pre-service teachers need to adjust with their new environment from kindergarten, change to grade 6 and it was not easy for them. Being in a real teaching world can make them stressed out. Having a strategic plan to create classroom structures that kept students safe and allowed for maximum learning was necessary to their success as pre-service teachers. Generally, they believe that setting clear and direct rules, build stronger relationship, promoting student agency and implementing reward system may address the issues and concern they have encountered.

The last problem was from the pre service-teachers' lack of experiences and background knowledge. Accordingly, even when they mentored properly by their supervising instructors and they think that they possess the necessary 21st century skills, it is lacking when it comes to real teaching scenario. They suggested, that in order to address this issue and concern, they always believe of the experiential learning. More experiences, means more learning. Accordingly, adjustment is also the key to proper handling of classes. They believe that it is very important for the pre-service teachers to realize that it is all common and normal to face problems which is related to their first teaching in real school environment. Consulting to their supervising instructors or cooperating teachers and even to senior students, mentor-teachers, and university supervisors might help reducing their anxiety.

Conclusion

The five components of mentoring were practiced by the supervising instructors all the time, therefore pre service teachers are secured with the same standard of competencies, instructive prospects and learning environment.

The study proved the Experiential Learning Theory which places experience as the center of learning process. As the pre-service teachers undergo actual teaching experiences, more skills are developed among them. If the pre-service teachers were given more teaching experience with the proper guidance of the mentor (supervising instructors) then they can teach and perform well. Some of the Pre-service teachers' 21st century skills were already manifested earlier but some seems need more time to be developed, then it is here where the role of supervising instructors comes in and mentoring serves its purpose.

In addition, the study also fits Hudson's concepts on Mentoring Practices. Learned from the study, actively engaging mentors who apply the principles of five factor areas will serve to ensure highly effective support for the skills development of pre-service teachers (mentee).

Recommendations

Based on the findings and conclusions, the following recommendations are given;

1. Pre-service teachers should undergo interventions programs long before they even be ready for their practice teaching
2. The College of Education Curriculum Committee should consider the findings of this study and plan for whatever its data can help in improving the instructors and professors who will be training the education students to become real and effective teachers.
3. School heads may equally assign teachers with different ancillary duties and additional works with regards to their expertise.
4. Supervising instructors could help boost self-efficacy for learning and performance by establishing specific, shot-term yet attainable goals, laying out specific learning strategies, stressing on their interest, allowing them to make their own choice, encouraging oftentimes and giving them positive feedback.
5. Supervising instructors have a vital role in motivating pre service teachers during practice teaching. Therefore, a need to encourage them performed beyond what is expected to earn better grades, used teaching styles that caters diverse learners, motivation and provide stimulating discussions during the teaching process for future use.
6. Teachers may attend to trainings or seminars on professional development for innovative teaching strategies, classroom management, time management and classroom behavioral management to upgrade with new strategies and trends in teaching,

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Analysis of Technological and Pedagogical Knowledge (TPK) on Prospective Biology Teachers to Welcome the Era of Society 5.0

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ABSTRACT

The era of society 5.0 was a human condition and technology will coexist in creating a better living condition. In this era, technology would also affect the world of education. Technology would affect the way a teacher teaches and the way students learn. How to teach a teacher must be developed in accordance with technological developments. The era of society 5.0 would greatly affect the pedagogical ability of a teacher. Teacher's pedagogical knowledge and teacher's technological knowledge must be analyzed whether it is in accordance with the demands of this era or not. This research aimed to determine the level of Technological and Pedagogical knowledge (TPK) of students of biology education at the Christian University of Indonesia. This research was a qualitative descriptive study. Data collection was carried out in two ways, namely by conducting a survey of respondents about pedagogic knowledge and technological knowledge in the era of society 5.0. Data collection was also carried out by observing the learning implementation plan document which was assessed by two panelists. The population in this study were students of the Biology Education study program at the Christian University of Indonesia. The conclusions of this study were 1) The level of Technological and Pedagogical knowledge (TPK) of biology education students is sufficient in terms of written test results 2) Technological and Pedagogical knowledge (TPK) of students fit into the criteria enough in terms of the results of observations of the learning implementation plan document.

Keywords: technological, pedagogical, knowledge, era of society 5.0, students

INTRODUCTION

Technological and Pedagogical knowledge (TPK) is a very important thing to be mastered by a prospective teacher. Technological and Pedagogical knowledge (TPK) is a combination of pedagogical knowledge (PK) and knowledge of information technology in the era of society 5.0 (TK). Pedagogical knowledge is one of the knowledge that explores the competencies that a teacher must have in addition to professional, social and personality competencies, which are aspects that cannot be ignored if a teacher wants to build student knowledge (Purwianingsih, 2010). Pedagogical ability is how teachers understand students, design and implement lesson plans, evaluate learning outcomes, and develop students to actualize their various potentials.

Pedagogical skills are needed in dealing with this era of society 5.0. The era of society 5.0 is an era where the use of technology will be applied in all activities in the world of education (Ratnanenei, 2021). To face the era of society 5.0, a teacher must be able to have deep and mature pedagogical knowledge so that teachers can master students and learning that is surrounded by rapid technological advances. Advanced technology must always be involved by teachers in understanding students, designing learning, implementing learning, evaluating learning, and developing student potential. All of this means that technological knowledge will support the pedagogical abilities of a teacher in the era of society 5.0.

Technological knowledge here means Technological Knowledge (TK) is knowledge of standard technologies, such as books, chalk and whiteboards, and more advanced technologies, such as the internet and digital video. This involves the skills that needed to operate certain technologies (Oktamersetyayani, 2018). Knowledge of technology here can be interpreted as all things technology related to the pedagogical ability of teachers in preparing learning, conducting learning, and evaluating learning. This technology includes learning media applications, lesson plans design applications, concept map making applications, learning outcomes evaluation applications, e-rapot applications, two-way learning implementation applications, and so on.

Technological and Pedagogical knowledge (TPK) is the right answer to prepare prospective teachers for the era of society 5.0. A deep TPK analysis needs to be done to answer all of that. TPK analysis can be used to evaluate courses that should be given mandatory and even developed to make teacher candidates more aware of pedagogical abilities and technological knowledge. Pedagogical knowledge that must be mastered includes understanding students, designing and implementing lesson plans, evaluating learning outcomes, and developing students to actualize their various potentials.

The reality on the ground, especially at the Indonesian Christian University, shows that there is a lack of information or description about Technological and Pedagogical knowledge (TPK) from prospective biology teachers. The application of the principles of Technological and Pedagogical knowledge (TPK) is one way that is considered effective to achieve graduate competence, especially knowledge and skills. Teachers in the future need to master a good understanding of how to use pedagogical knowledge and technology effectively in the learning process in the classroom. To answer this need, Koehler and Mishra (Nordin, et al, 2013: 2) introduced a conceptual framework called Technological and Pedagogical knowledge (TPK) which was obtained from the addition of technology to Pedagogical Knowledge (PCK) which is a conceptual framework built by Shulman (1986). According to Qudus (2020) the concept of Technological and Pedagogical knowledge (TPK) is the ability of teachers to use technology that will be used in the procedures and implementation of learning planning, so that the use of this technology can make it easier for teachers to teach and change teacher teaching every day so that teaching is not monotonous for students.

Technology that collaborates with good pedagogical skills will be able to help make learning interesting. If students are already interested in the learning brought by the teacher, it will be easier for students to understand the material because there is a desire from within students to follow the flow of learning and teaching materials. Creativity in the delivery of teaching materials, if you get a touch of technology, the creativity will not be limited.

Technological and Pedagogical knowledge (TPK) contains two main components, namely Technological Knowledge (TK) and Pedagogical Knowledge (PK). First, Kindergarten describes the knowledge of prospective teachers regarding knowledge of technology for making learning devices. Second, PK describes the knowledge of prospective teachers about practical mastery, processes, strategies, procedures, and methods in the teaching and learning process (Shulman, 1986). Technological and Pedagogical knowledge (TPK) can also increase knowledge and skills including the ability to think critically, creatively, communicate and collaborate (Berber and Erdem, 2015). Teachers who master Technological and Pedagogical knowledge (TPK) are believed to be able to create a pleasant learning atmosphere and make it easier for students to understand the material.

The material that is very important to be touched by a teacher who understands Technological and Pedagogical knowledge (TPK) is Biology. Biology is a material that gets a lot of material from the surrounding environment. Biological material is always evolving and undergoing a renewal. This material will be very suitable if the teacher who teaches always masters technological developments and has good pedagogical skills to bring their learning activities to be active, innovative, creative, and fun. Biology material is material that contains a lot of conceptual material so that if the delivery of conceptual material uses technology, the teacher and students will benefit. The teacher will be easy to convey the material, the students will more easily understand the material.

Biology education is a study program that will graduate prospective biology teachers. Preparing students as teacher candidates to educate well requires teaching practice by providing opportunities for prospective teachers to appear in front as a form of practice. Teaching practice in front of the class is very important in the lecture process. This teaching practice begins when students take biology and microteaching methodologies courses. In biology learning methodology lectures and microteaching prospective teachers can actualize pedagogical abilities, actualize technology, know the ability to master theories in learning. As prospective teachers, students must master and understand technology in the era of society 5, if teachers can't understand technology, then learning will be very boring because it's only based on books and paper. What's interesting about today's sophisticated applications.

Based on the above background, information is needed regarding the Technological and Pedagogical knowledge (TPK)) of education students. To find out, it is necessary to conduct an analysis by observing or observing lesson plan documents, and a written test of Technological and Pedagogical knowledge (TPK) on students in the biology education study program at the Christian University of Indonesia on the grounds that the study program has never conducted research with the same problem. so it is hoped that this research will be information for students as prospective teachers and provide information to study programs to help prepare and improve the quality of undergraduate biology education students.

RESEARCH METHODS

This research is a qualitative descriptive study with a survey method. According to Moleong (2005:4), a qualitative descriptive approach is a research approach where the data collected is in the form of words, pictures and not numbers. These data can be obtained from interviews, field notes, photos, video

tapes, personal documentation, notes, or memos and other documentation. The research focuses on analyzing the ability of Technological and Pedagogical knowledge (TPK) in Biology Education students at the Christian University of Indonesia in semester 2, 4, 6, and 8. Data were collected through observation of lesson plan documents (RPP), and written tests. The survey was conducted on all students who had received the Biology learning design and strategy course. The survey was conducted by providing a google form containing questions about technological knowledge and pedagogical knowledge. Then students are asked to fill in the google form with the specified time. The instrument used is an instrument that has been validated by previous research conducted by Oktamersetyani 2018. The instrument consist of Goal Formulation Learning, Selection of Teaching Materials, Media Selection Learning, Methods/approaches/models Learning, Steps Learning, and Assessment Design Learning (Oktamersetyani, 2018)

Place and Time of Research

The research was carried out at the Biology Education Study Program, FKIP, Indonesian Christian University. Research time will start from March to August 2021 for classes entering the even semester of the 2020/2021 academic year.

Population and Research Sample

The population in this study were all students of the biology education study program at the Christian University of Indonesia, where all members of the population were sampled, this is due to the characteristics of different population members, so that a sample of 57 students was obtained. Thus this research is a purposive sampling research. The selected sample is a sample that has received a biology learning methodology course as well as a biology learning design and strategy course.

Research variable

The variable in this study is the ability of Technological and Pedagogical knowledge (TPK) in Biology Education study program students at the Christian University of Indonesia which includes the ability of Technological Knowledge (TK) and Pedagogical Knowledge (PK).

Data collection

Data collection techniques used in this study were written tests, lesson plans observations, and documentation. Observations are made by assessing the lesson plans or lesson plans that have been made by students. RPP is assessed based on the RPP assessment observation sheet which contains the formulation of learning objectives, selection of teaching materials, selection of learning media, methods/approaches/learning models, learning steps, learning assessment design.

Data analysis technique

The data that has been obtained from the Research on Technological and Pedagogical Knowledge (TPK) Ability Analysis of Biology Education Students at the Christian University of Indonesia is qualitative data from the observations of research subjects. Data analysis was carried out descriptively qualitatively to find out a general description or description of the level of Technological and Pedagogical knowledge (TPK) abilities of biology education students.

RESULTS AND DISCUSSION

Technological and Pedagogical knowledge (TPK) is a very important thing to be mastered by a prospective teacher. Technological and Pedagogical knowledge (TPK) is a combination of pedagogical knowledge (PK) and knowledge of information technology in the era of society 5.0 (TK). Pedagogical knowledge is one of the knowledge that explores the competencies that a teacher must have in addition to professional, social and personality competencies, which are aspects that cannot be ignored if a teacher wants to build student knowledge (Purwianingsih, 2010). Pedagogical ability is how teachers understand students, design and implement lesson plans, evaluate learning outcomes, and develop students to actualize their various potentials.

Pedagogical skills are needed in dealing with this era of society 5.0. The era of society 5.0 is an era where the use of technology will be applied in all activities in the world of education (Ratnaneneci, 2021). To face the era of society 5.0, a teacher must be able to have deep and mature pedagogical knowledge so that teachers can master students and learning that is surrounded by rapid technological advances. Advanced technology must always be involved by teachers in understanding students, designing learning, implementing learning, evaluating learning, and developing student potential. All of this means that technological knowledge will support the pedagogical abilities of a teacher in the era of society 5.0.

Technological knowledge here means Technological Knowledge (TK) is knowledge of standard technologies, such as books, chalk and whiteboards, and more advanced technologies, such as the internet and digital video. This involves the skills needed to operate certain technologies (Oktamersetyayani, 2018). Knowledge of technology here can be interpreted as all things technology related to the pedagogical ability of teachers in preparing learning, conducting learning, and evaluating learning. This technology includes learning media applications, lesson plans design applications, concept map making applications, learning outcomes evaluation applications, e-rapot applications, two-way learning implementation applications, and so on.

Technological and Pedagogical knowledge (TPK) is the right answer to prepare prospective teachers for the era of society 5.0. A deep TPK analysis needs to be done to answer all of that. TPK analysis can be used to evaluate courses that should be given mandatory and even developed to make teacher candidates more aware of pedagogical abilities and technological knowledge. Pedagogical knowledge that must be mastered includes understanding students, designing and implementing lesson plans, evaluating learning outcomes, and developing students to actualize their various potentials.

Pedagogic competence is the ability of teachers to manage student learning. Pedagogic competence includes various skills, namely skills in managing learning well, starting from designing learning activities, managing learning, to evaluating and improving the learning carried out (Kurniawan, 2017). Meanwhile, Technological knowledge (TK) is Technological Knowledge, which is a science that educators must have about technology that can support learning. Kindergarten includes the understanding of educators in the use of computer elements, as well as supporting equipment and other technologies related to education and learning. In addition to being required to have knowledge related to technology, teachers are required to have the skills to adapt and learn new technologies. This ability needs to be mastered by educators considering that technological advances and changes are always evolving (Rosyid, 2016).

This study uses 2 main data to describe the Technological and Pedagogical knowledge (TPK) of prospective Biology teachers at the Faculty of Teacher Training and Education, Christian University of Indonesia. The first data was obtained from the value of Biology desert candidates answering questions related to Pedagogical Knowledge (PK) and Technological Konoweledge (TK) materials. The second data is obtained from the results of the assessment of the Lesson Plan document that has

been made by each student carried out by 1 senior teacher and 1 Education lecturer. The two data will be used to analyze the pedagogical abilities and technological knowledge of prospective Biology teachers.

The results of the average ability scores in table 1 below are obtained from student scores after working on pedagogic and technological ability tests related to learning biology in class XI which are distributed by researchers via google form. The value obtained from this test is the value of pedagogical knowledge (PK), the value of technological knowledge (TK) , and a combination of Technological and Pedagogical knowledge (TPK). These values can be seen in the table below.

Table 1: Average Technological and Pedagogical knowledge (TPK)

Aspects of Knowledge	**Average Value**	**Conclusion**
Technologisal Knowledge (TK)	51.06	GOOD
Pedagogical Knowledge (PK)	35.74	ENOUGH
Technological Pedagogical Knowledge (TPK)	43.40	ENOUGH

Description: Source: (Direktorat Pembinaan SMA, 2010)

$75 \leq M \geq 100$	= Very Good
$50 \leq M < 75$	= Good
$25 \leq M < 50$	= Enough
$0 \leq M < 25$	= Less

The data above shows that Pedagogical Knowledge or PK gets a value of 35.74. According to the Directorate of High School Development (2010) this value is in the sufficient range. While the value of technological knowledge or knowledge of technology in Biology learning gets an average value of 48.68. According to the Directorate of High School Development (2010) this value is in the sufficient range. From these results, it can be concluded that the pedagogical knowledge of prospective Biology teachers is in the sufficient category. Based on these results, the study program must multiply Education courses related to pedagogical abilities. For the value of knowledge of Biology learning technology also shows sufficient value, it is necessary to increase understanding of material related to technology related to learning.

Tabel 2: Pedagogical Knowledge dan Technological Knowledge Based on the results of the Lesson Plan Document Observation

Lesson Plan Aspects	**Panelist A**	**Panelist B**	**Match Test Value**	**Conclusion**
Goal Formulation Learning	67,00	63,00	1,00	GOOD
Selection of Teaching Materials	42,00	43,80	1,00	ENOUGH
Media Selection Learning	51,50	52,33	1,00	ENOUGH
Methods/approaches/models Learning	70,00	71,00	1,00	GOOD

Steps Learning	67,00	68,00	1,00	GOOD
Assessment Design Learning	26,00	25,50	1,00	LESS
Average	53.91667	53.93833	**1,00**	**ENOUGH**

Description: Source: (Directorate of High School Development, 2010: 60)

$81.25 \leq M \geq 100$ = Very Good
$62.5 \leq M < 81.25$ = Good
$43.75 \leq M < 62.5$ = Enough
$25 \leq M < 43,75$ = Less

Data from table 2 shows that pedagogical knowledge and teenological knowledge assessed by observation of Lesson Plan documents include good, sufficient and less grades with an average value of sufficient. This shows that the Technological and Pedagogical knowledge (TPK) of prospective UKI biology teachers in the range is sufficiently seen from the observation of the Lesson Plan document. Pedagogical Knowledge (PK) seen from the Lesson Plan or learning implementation plan is an assessment of students, teaching approaches, classroom management of learning steps, adjustment of learning styles with students according to the learning steps and learning models chosen (Candra, 2020). This Lesson Plan assessment is also based on pedagogical knowledge (PK) components according to (Chai, Koh, & Tsai, 2010) namely 1) adjustment of teaching styles with different learners, 2) adjustment of teaching based on what students understand or do not understand, 3) using various teaching approaches in the classroom (collaborative teaching, direct instruction, inquiry learning, etc.), 4) the teacher knows how to assess the performance of students in the classroom, 5) class management. As for the technological (TK) it can be seen from the students' ability to choose teaching materials, make concept maps, make goals according to basic competencies (KD), and make learning steps in accordance with KD.

The above also shows that *pedagogical content knowledge* (PCK) from the Lesson Plan observations in table 2 shows panelists A and B giving indicators of the formulation of learning objectives with good grades. Then for the selection of teaching materials and the selection of learning media, panelist A and panelist B gave sufficient grades. As for the learning method, learning steps, and learning assessment design, it provides less value. These results reflect that there must be an increase in training in making Lesson Plan so that prospective teachers make Lesson Plan with good or even very good pedagogical knowledge and content knowledge.

Pedagogical Knowledge (PK)

The pedagogical knowledge and pedagogical abilities possessed by prospective Biology teachers at the Christian University of Indonesia are in the sufficient category. This proves that this prospective Biology teacher student is already in the stage of sufficiently mastering the known pedagogical knowledge to be implemented in learning through a lesson plan or learning implementation plan. According to (Mishra & Koehler, 2006) *Pedagogical Knowledge* (PK) that will be seen in student-made Lesson Plan is the problem of step steps of student learning activities, class management can be seen from what model design is used, development and implementation of learning plans, and evaluation of learning contained in the appendix to the Lesson Plan. Teachers must be able to develop and implement learning implementation plans to be able to compile effective teaching and learning activities, this is in accordance with the opinion that with the use of learning tools such as Lesson Plan (learning implementation plans) teachers will be more helped in the implementation of learning.

Students of prospective Biology teacher at UKI still has sufficient pedagogical skills judging from the results of answering the pedagogical knowledge test and observation of Lesson Plan documents. This can be seen from the majority of students who are not good enough in understanding models / methods / approaches that are in accordance with the characteristics of the material, the learning objectives to be delivered and the characteristics of students, so that the learning process has not been able to run effectively. Based on these results, students need to increase their pedagogical knowledge with the aim of being able to know and be able to implement pedagogical knowledge both in writing through tests and in practice (microteaching) so that the material can be conveyed properly with appropriate learning methods.

According to Kanuka (Sahin, 2011: 98) according to Government Regulation Number 74 of 2008 pedagogical knowledge is the ability to manage student learning which includes understanding of the educational foundation, understanding of students, developing syllabus, learning planning, implementing learning, utilizing technologists i learning, evaluation of learning outcomes, and development of students to actualize the various potential talents possessed. Pedagogical knowledge is knowledge of teaching strategies and methods to answer the needs of learners in the learning process. Teaching and learning which includes practices, procedures, or methods needed in the learning and teaching process (Oktamersetyayani, 2018).

Pedagogical knowledge also includes knowledge of techniques or methods used in the classroom, recognizing the characteristics of learners and strategies for the evaluation of learners' understanding. This will have its own uniqueness in each teacher. It is this uniqueness that illustrates the degree of depth of pedagogic knowledge. A teacher with deep pedagogical knowledge will understand how to build learner knowledge to acquire skills and how learners develop a positive dispositional way of thinking towards learning (Wahyuningtyas, 2022).

Technological Knowledge (TK)

Technological Knowledge (TK) according to Nasution (2018) has many benefits that can be obtained when implemented optimally in learning including 1) for learners to increase attention, concentration, motivation, and independence, 2) for teachers to reduce time in delivering material, make student learning experiences more enjoyable, design material to be more interesting, and trigger teachers to developed his knowledge and abilities about computers. Alavi (2003) outlined several objectives of using technology in learning, namely improving the quality of learning, student satisfaction, income, and service quality.

Technological Knowledge (TK) contains how students who are prospective biology teachers know various kinds of social media platforms (such as; Blog, Facebook, and Youtube), LMS (Learning Management System) platforms (such as; Google Classroom, Edmodo, Moodle and Dokeos), conference software such as; Skype, Google Meet, and Zoom, basic software such as office applications (such as; Word, Excel, and Powerpoint), learning quiz makers (such as; Kahoot and Quizizz), image processors (such as; Adobe Photoshop, CorelDraw and Adobe Illustrator), video processors (Movie Maker, Power Director, and Adobe Premiere), learning media makers (such as; Adobe Flash, Autoplay, and Lectora), 2D and 3D animation makers (such as; 3dsMax and Blender) and technologies such as Augmented Reality (AR) and Virtual Reality (VR). This must be known by students when they are still in college. To get to the era of society 5.0, this will be something that must be implemented in the study of students when in school.

Ability to use hardware such as; Computers, Laptops, Smartphones, Printers, Scanners and LCD projectors must also be mastered if the prospective teacher masters Technological Knowledge (TK)

(Fitriyana et al., 2021). Prospective teachers are important in mastering this knowledge of Biology technology. All basic competencies in all classes in Senior High School must be mastered by teachers with the material and the development of the latest information. This is because without this knowledge it will allow for misconceptions about the technology of the material to be taught. Technological knowledge is the teacher's knowledge of the subject matter to be studied or taught. Knowledge of technology is very important for teachers as well as prospective teachers. Technological knowledge contains knowledge of concepts, theories, ideas, frameworks, knowledge of proof, as well as practices and approaches to developing such knowledge (Sahin, 2011: 99).

The limitations of this study are that the sample is not representative because students are mixed in different semesters, the documents that are observed are only lesson plans, other documents such as student worksheets and evaluation sheets, the instrument used does not have many questions so that it does not represent all Technological Pedagogical Knowledge abilities. Suggestions for further research is the development of instruments regarding TPK or Technological Pedagogical Knowledge. Further research is also expected to contain data not only on RPP observations but also direct observations of teaching methods. In addition, it is also expected that the sample is all students who are taking PPL courses or practicing teaching experiences in schools.

CONCLUSION

Based on the discussion above, the conclusions in this article are as follows.

1. The level of Technological *Pedagogical* Knowledge (TPK) ability of biology education students is sufficient in terms of test results regarding Technological *Pedagogical* Knowledge (TPK) knowledge.
2. The level of Technological *Pedagogical* Knowledge (TPK) ability of biology education students entered the criteria sufficiently reviewed from the results of the observation of the Lesson Plan document.

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Learning Development for Early Childhood by 5-STEPs learning process following King Rama IX's Philosophy regarding Early Childhood Inclusive Education

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ABSTRACT

This research aims to compare the learning of early childhood, before and after the 5-step learning process, using the philosophy of King Rama IX in inclusive education. The target groups were early childhood, boys and girls aged between 3-4 years at school A (Private School), 56 children, and 3 with special needs. Early childhood, boys and girls aged between 3-4 years at school B (Public School), 44 children and 2 with special needs. The research instrument used were 8 plans for organizing the 5-STEPs learning process and early childhood development assessment form. The reliability value was 0.88; the data were analyzed by using statistics, averages, and standard deviation. The results revealed that the learning of early childhood was obtained from the 5-STEPs learning process, using the philosophy of King Rama IX in inclusive education, schools A and B had higher averages than before, and children with special needs could learn, with increased development.

Keywords: Early Childhood, Inclusive Education, 5-STEPs learning process, King Rama IX's Philosophy

Introduction

Early Childhood is the most important period as a child's brain develops more rapidly than at any other time in life, physically, emotional-mental, socially, and intellectually. Early childhood development requires holistic development through comprehensive and balanced development. Holistic development is important to develop children to their full potential, with a healthy body, fluency movement, cheerful thoughts, self-control, self-understanding, life skills, using language effectively, problem-solving and critical thinking, gaining self-Knowledge (Preschool Education Association of Thailand Under the Royal Patronage, 2017). This means it should not discriminate against children's disabilities and should understand individual differences. Children with special needs should receive support services, to support inclusive learning for children with disabilities in early childhood (MURC, n.d.). Awareness of the right to equality in education, the right to develop, increase the alignment and create equality, regardless of whether the children study in different educational institutions (Chotrun, n.d.). Polrapee Tummaphan said that "The group of children with special needs, who can study with normal children consists of 4 groups that include (1) Children with Mental Retardation, (2) Children with learning disabilities. (3) Children with Behavioral and Emotional Disorders and, (4) Children with autism are the most common group in educational institutions." (Khaosod Online, 2020).

Organizing the 5-STEPs learning process using King Rama IX's Philosophy is the teaching and learning process that underscores His Majesty's Philosophy. King Rama IX created his philosophy through his wisdom in raising sons and daughters of His Royal Highness Somdej Chao Fa Mahidol Adulyadej Kromma Luang Songkla Nakarin and Her Royal Highness Princess Srinagarindra Mahidol. (Office of Knowledge Management and Development, 2013). The philosophy of King Rama IX has 5 steps: Step 1: Question; Step 2: Search; Step 3: Construct; Step 4: Communicate; and Step 5: Serve (Boonthanom et al., 2021). Organizing learning activities that develop children as a whole and providing opportunities for children to communicate creatively learn through play and practice with the characteristics of playing is the philosophy of King Rama IX. This includes playing with nature surrounding the child, including living things and non-living things such as soil, sand, water, trees, toys from household items, problem-solving, and inventions.

I have taught the fourth year students in Accordance with The King Rama IX's philosophy regarding Early Childhood Education and recognize the importance of giving them a direct experience in applying the theory of King Rama IX's. In this research the fourth year students participated in the design of lesson plans; and organized activities for the development of early childhood learning.

This study applied the 5-step learning process model, using The King Rama IX philosophy with early childhood to see the learning effect and whether different educational institutions were affected by the early childhood learning method.

Research objective

The research objective is to compare the learning of early childhood, before and after the 5-STEPs learning process, using the philosophy of King Rama IX in inclusive education.

Research methods

Target groups

The researcher selected a specific target group (Purposive Sampling) consisting of early childhood boys and girls, aged between 3-4 years at school A (Private School), 56 children and 3 with special

needs, and early childhood boys and girls aged between 3-4 years at school B (Public School), 44 children and 2 with special needs.

Research Instruments

The research instruments used consisted of 8 plans for organizing the 5-STEPs learning process and early childhood development assessment form. The organization of the research instruments is as follows:

1. Plans for organizing the learning process of 5 steps, 8 plans

1.1 Studying an Early Childhood Education Program (Ministry of Education, 2017) and The King Rama IX's Philosophy documents.

1.2 Studying concepts of the 5-STEPs learning process, using the philosophy of King Rama IX. (Boonthanom et al., 2021).

1.3 Planning for organizing 8 plans of the 5-step learning process, which consisted of: Step 1: Learning to question; Step 2: Learning to search; Step 3: Learning to construct; Step 4: Learning to communicate; and Step 5: Learning to service. The activities are as follows:

- ***Activity 1:*** Scooping mosquito eggs (Playing with nature: Water)
- ***Activity 2:*** Hunt for COVID-19 (Playing with nature: Sand)
- ***Activity 3:*** How to prevent yourself from hand, foot, and mouth disease. (Play to solve problems)
- ***Activity 4:*** We can do it (Playing with Housework)
- ***Activity 5:*** Storytelling "Tuk Tik eats vegetables and Tok Tack eats candy (Philosophy of Sufficiency Economy)
- ***Activity 6:*** Plant me to grow (Philosophy of Sufficiency Economy)
- ***Activity 7:*** Eating well (Philosophy of Sufficiency Economy)
- ***Activity 8:*** My piggy bank (Philosophy of Sufficiency Economy)

1.4 Presenting 5-STEPs learning process plan to 3 experts for reviews and modifications.

1.5 The modified 5-STEPs learning process was implemented with the target group.

2. Early Childhood Development Assessment Form

2.1 Studying the early childhood education curriculum (Ministry of Education, 2017) and Inclusive Education of King Rama IX's Philosophy documents.

2.2 Creating an early childhood development assessment form covering four areas of holistic development: physical, emotional, social, and intellectual.

2.3 Assessment criteria had 3 points such as 3 points=high, 2 points= moderate and 1 points= low. Total of 20 items, totaling 60 points.

2.4 Presenting the early childhood development assessment form of the 5-step learning process plan to 3 experts, to verify the quality and consistency of the assessment. The assessment results for each item were between 0.67-1.00, and the reliability value was 0.88, showing the assessment form was reliable to use.

2.5 The modified assessment form was sampled with a group that was close to the target (a group of 20 people).

2.6 Apply the modified assessment form to the target group, before and after the experiment.

Data collection

The researcher experimented as follows:

1. Assessing the target group before the experiment (Pretest) and then checking the score.
2. The researcher experimented with the organizing of the 5-STEPs learning process, implementing 2 plans in a week, 2 days a week, 1 hour per day, totaling 8 plans in 4 weeks.
3. Complete the assessment form after the experiment (Post-test) then check the score.
4. Collect the data and analyze it by using statistics.

Data analysis

The data analysis was conducted using a computer program to find basic statistics, median, and standard deviation, for the scores on the early childhood development assessment form.

Discussion of Findings

The results revealed that 1) The learning early childhood, who received the 5-STEPs learning process using King Rama IX's Philosophy Inclusive Education, School A, and School B had higher averages after the experiment as follows:

Table 1: The comparison of the average learning scores of Early Childhood Inclusive Education in School A (Private School) Pre and Post-Tests.

(N=56)

School A (Private School)	μ	σ
Pretest	24.41	0.41
Post-test	57.20	0.35

Table 2: The comparison of the average learning scores of Early Childhood Inclusive Education in School B (Public School) Pre and Post-Tests.

(N=44)

School B (Public School)	μ	σ
Pretest	22.41	0.33
Post-test	50.80	0.50

Table 3: The separate development comparison of the average learning scores of Early Childhood Inclusive Education School A (Private School) Pre and Post-Tests.

(N=56)

School A (Private School)	μ	σ
Physical Development		
Pretest	6.11	0.62
Post-test	14.27	0.35

Table 4: The separate development comparison of the average learning scores of Early Childhood Inclusive Education School A (Private school) Pre and Post-Tests (continue)

(N=56)

School A (Private School)	μ	σ
Emotional Development		
Pretest	6.02	0.40
Post-test	14.30	0.35
Social Development		
Pretest	6.14	0.42

Post-test	14.38	0.33
Cognitive Development		
Pretest	6.14	0.42
Post-test	14.25	0.36

Table 5: The separate development comparison of the average learning scores of Early Childhood Inclusive Education School B (Public School) Pre and Post-Tests

(N=44)

School B (Public School)	μ	σ
Physical Development		
Pretest	5.64	0.33
Post-test	13.23	0.48
Emotional Development		
Pretest	5.57	0.32
Post-test	12.41	0.50
Social Development		
Pretest	5.68	0.34
Post-test	13.07	0.51
Cognitive Development		
Pretest	5.52	0.31
Post-test	12.10	0.50

The results revealed that 3 children with special needs from School A and 2 from School B were able to learn with increased development as presented in Chart 1 as follows:

Chart 1: The learning development of children with special needs. Before and after the experiment.

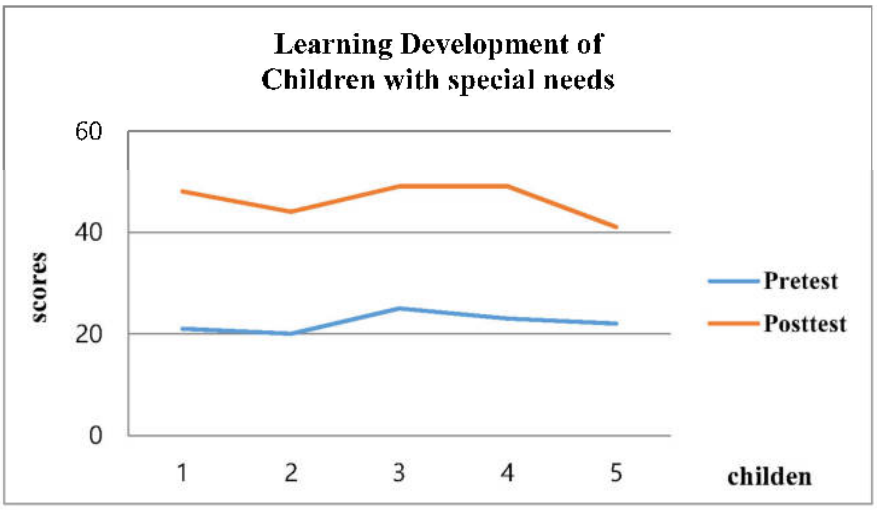

Figure 1: Illustration of Scooping mosquito eggs activity (playing with nature: water)
Source: School A (Private School)

Figure 2: Illustration of Hunt for COVID-19 activity (playing with nature: sand)
Source: School A (Private School)

Figure 3: Illustration of Plant Me to Grow activity and student work (Philosophy of Sufficiency Economy) Source: School B (Public School)

Figure 4: Illustration of the Piggy Bank activity and student work. (Philosophy of Sufficiency Economy) Source: School B (Public School)

Discussion

The objective of this research was to compare the learning of early childhood, before and after the 5-STEPs learning process, using King Rama IX's Philosophy of Early Childhood Inclusive Education. The result revealed that the learning of early childhood from the 5-STEPs learning process at school A and School B had higher averages after the test and children with special needs can learn, with increased development. The results of higher averages are due to the 5-STEPs learning process of King Rama IX's Philosophy. It consisted of activities that allow children to learn through action and give children the opportunity to work independently, interact with friends and with other people as well as the environment. The students enjoyed playing, exploring, experimenting, and using their 5 senses by interacting with props that the researcher has prepared for them. For example, using the ears to listen to the storytelling of "Tuk Tik eats vegetables - Tok Tack eats candy", the nose to smell and the tongue to taste food, from the "Eating Well" activity. Students used their hands and feet to touch the water, from

the "Scooping Mosquito Eggs" activity, in which children had to hold the spoon to collect mosquito eggs in the water. In "Touch the sand" and "Hunt for COVID-19" activities, children must find the germs hidden in the sand pile. Students had to touch the soil, from the "Plant Me to grow" activity, children had to plant vegetables in water bottles. Including the use of hands to pick up various devices in crafting, from "My piggy bank" activity.

Such activities are not separate, but a holistic development, which corresponds to the Preschool Education Association of Thailand Under the Royal Patronage (2017). The holistic development of children will enable them to develop to their full potential and lead to complete human beings. It helps students to be good person who is smart and happy. Consistent with Piaget, that play is an intellectual development process. Children's play begins with sensory play, which is exploring a tangible object. It is also consistent with playing in the footsteps of King Rama IX. Nature play stimulates creativity and problem-solving skills (McLeod, 2022, para.5). It is the guideline of playing in his youth that led King Rama IX to develop his philosophy (Office of Knowledge Management and Development, 2013). The difference between the educational institutions, that School A is an urban area and School B is a rural community, did not affect early childhood learning. Children can develop, because of The 5-STEPs learning process of King Rama IX's Philosophy Inclusive Education. . There are a variety of activities, children can play, listen to stories, cook, solve problems, and join crafts projects that give children the opportunity to do the activities equally, both normal children and children with special needs can achieve good learning and development to the fullest potential of each individual. This is consistent with the research of Pattanaprasit (2019) "Effects of Using Northern Folktales for Developing Listening and Speaking Skills of Children with special needs at the preschool level, Chiang Mai Province", which found that children with special needs, the groups with problems in listening and speaking skills, studying at the pre-primary level(Kindergarten Year 3) who received the northern folk tales that improved listening and speaking skills. This is why children with special needs can learn, with increased learning development.

Recommendation

1. Each child has different interests and learning. We must observe and support all children in their activities.

2. In this study, there were both normal and special needs children. Therefore, it is necessary to find a research assistant.

Acknowledgment

The researcher would like to extend gratitude and thanks to 14 students in the 4th year, Faculty of Early Childhood Education Program at Nakhonnayok Campus, Suan Dusit University who helped to research on this occasion.

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Re-Discovering Online Learning Situation and Teaching-Engagement Toward Institutional Development of Private Maritime University in the Philippines

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ABSTRACT

The study evaluates the level of the online-learning situation and teaching engagement among maritime students and instructors in the new normal at the private maritime university in the Philippines. The study utilized 500 students and 72 instructors in the maritime university in the Philippines. The researchers used a sequential explanatory design under the mixed method. The frequency, percentage, and mean were used to analyze the quantitative data, while the qualitative inputs were categorized into "themes" according to the responses of the participants. Results revealed that the level of online learning was "very high" as well as the level of teaching engagement. The dominant qualitative students' views regarding online learning were: easy to access and flexible, helpful and useful to the students, and encourage participation. Moreover, the results revealed that online learning was: "very challenging," "give much pressure," "expensive and give burden to some of the students," and "not enough for learning especially in dealing with laboratory activities." Views about online teaching were: "helpful tool in today's educational platform," "innovative," "an appropriate teaching method," and "exploratory." Challenges of online teaching include "unstable signals," "technical issues," "unpreparedness," and "frequent maintenance."

Keywords: Online Learning, Teaching-Engagement, New Normal, and Private Maritime University.

Introduction

As mentioned in the study of Colombo (2020), online education is perceived by many educators from different parts of the world to be effective compared to traditional or face-to-face learning in some aspects. In this study, it was found that learning could be borderless, available to those who can access it through the web and Internet, and information and data are ready to access anytime and anywhere as long as the signal permits. A majority of educators from higher education institutions considered online learning as part of the school's strategic growth as mentioned (Yang, 2017; Smith, 2015; Allen & Seaman, 2015; Ku, 2011; Lawton, et al., 2012; Lee, et al., 2011; Richman, 2015, Badia (2017) & Gonzalez, 2013; Navarro & Shoemaker, 2000; Denny, 2013; Mc Culchean, et al., 2015, Xu, Huang, Wang, & Heales, 2014; Ali, et al, 2020; Paul & Jefferson, 2019, and Liang & Chen (2012).

In dealing with online classes, the discussion is considered a beneficial method of instruction instead of a lecture, in which the students study the course contents before the class, satisfied with the online teaching method, and should be continually applied in teaching online in the university (Hu, Song, Chai, & Gong, 2020; Balouch, et al. 2019; Asdaque , Khan, & Rizvi , 2010; Tabanda, et al. (2014); Ivwighreghweta & Igere , 2014; Colombo, 2020). Instructional activities in schools, colleges, and universities are conducted through the Internet, including instructional activities. Therefore, many administrators rethink and review the prioritizing education spending and put online teaching up in the front (Alshehri, Mordhah, Alsibiani, Alsobhi, & Alnazzawi, 2020; Study of Wu, Guo, & Wang, 2021; Pardino, Gleyzer, Javed, Reid-Hector, & Heuer, 2018; Cao, Xie, Zhou, Gong, & Gao, 2020; Akhler, 2013, Fatima, Nasreen, Parvez, & Rahaman, 2020; Colombo , 2020, Chen , 2020). As the only maritime university in the Philippines and in South East Asia, Level 4 accredited status (B.S. Marine Engineering and B.S. Marine Transportation), an autonomous university, ISO accredited university by Norway, Germany, Japan, and France, the JBLFMU administration requires instructors to conduct several studies on online teaching to gather data and information for the improvement of online delivery. Thus, the authors accepted the challenge and conceptualized this investigation.

Statement of the Problem

The present study addressed the following specific questions that lead to the investigation of the researchers:

(1) What is the level of online learning situation among students at a private maritime university in the Philippines?

(2) What is the level of online teaching situation of the instructors at a private maritime university?

(3) Are there significant differences in the online learning of the respondents when classified according to gender, type of residence, age, Internet connection, and the number of hours?

(4) Are there significant differences in the online teaching engagement when the respondents were grouped according to different categories such as (a) gender, (b) type of residence, (c) number of years in teaching, (d) age, (e) highest educational attainment, and (f) department?

(5) What are the views and concerns on the online learning situation?

(6) What are the views of the respondents about the online teaching situation?

(7) What are the perceived indicators and challenges of online teaching?

Conceptual Framework

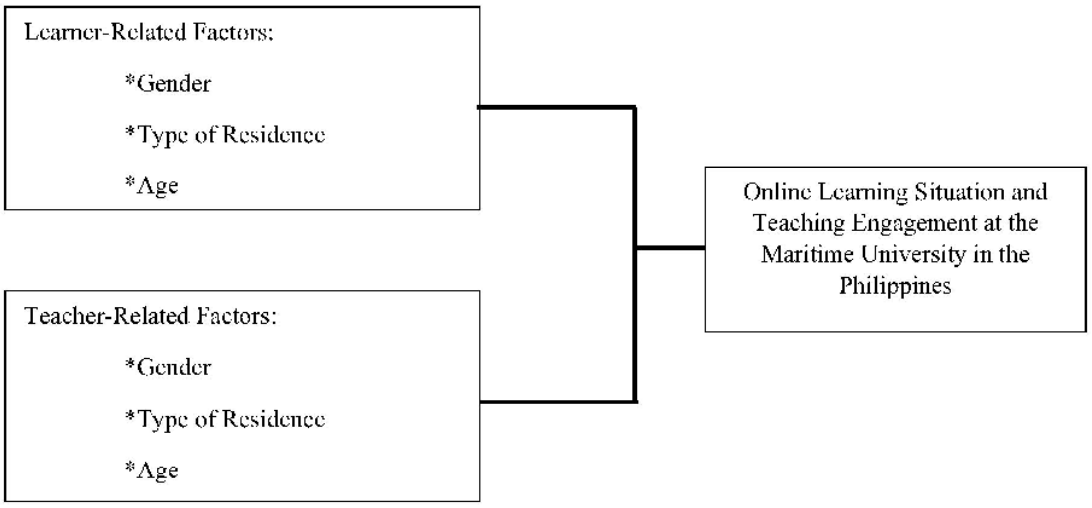


Figure 1: The research paradigm of the study.

Theoretical Framework

The study was anchored in the theory of Constructivism (Mc Leod, 2019) states that learning is influenced by the interaction of prior knowledge and new events. The shift from teacher-centered enables the students to define their own learning needs by using appropriate learning strategies. Internet and information technology are offering varied tools for the students to have learning opportunities in and out of the school's environment.

Method

The researchers used quantitative and qualitative research designs by using a "sequential explanatory design" (Creswell (2013). Likert-type data instrument was adopted from Jaleco's (2004) study but revised for this study. The revised instrument was submitted to the experts for review and validation. After a series of revisions and refinement, the researchers distributed the instruments to the respondents. Statistical tools used were average-mean, t-test, and Analysis of Variance (ANOVA). The researchers used Cronbach alpha for reliability and the obtained result was .876.

Results and Discussion

The results in this section present the following: (a) level of online teaching, (b) level of online teaching engagement, (c) inferential results in the level of online learning, (d) inferential results in the level of online teaching engagement, (e) views on online learning situation, (f) concerns of online learning situation

A. Level of Online Learning Situation

The results revealed that the level of online learning of the participants is "very high" as an entire group as indicated by the mean of 4.25 and when classified according to different categories. This means that

students in the private maritime university achieved the objectives of the learning to prepare them to become competent maritime graduates. Students' learning is done 24/7, which means the students could ask their teachers any time of the day. The online platform of the school is always ready and modules of the subjects were already available.

B. Level of Online Teaching Engagement

The results revealed that the instructors' level of online teaching engagement in this particular study is "very high" (M = 4.40) as an entire group and also with the different categories. This indicates the teachers spent most of their time answering the questions of the students even in the middle of the night. This signifies that the engagement of the instructors with their students has no boundaries, they ask to interact with the teachers through Facebook, messengers, e-mails, and Instagram.

C. Differences in the Level of Online Learning Situation

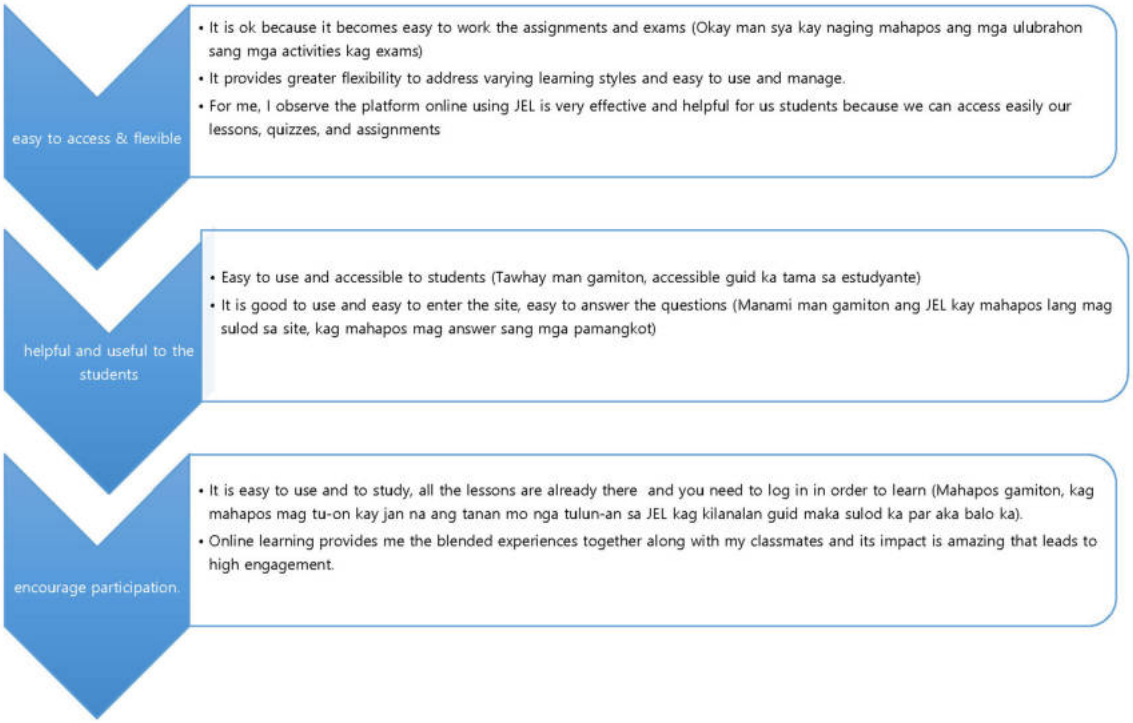
The t-test results of the variables indicate that there are no significant differences in the level of online learning among the respondents when classified according to gender with the two categories as male and female respondents. (t-value = -.162; p = .871). The same result is generated as to the type of residence (t -value = .300; p = .765), age (t-value = .735, p =.465) , and Internet connection (t-value = 1.231, p = .219). This means that the groupings/categories of the students do not influence the level of online learning of the students. The learning is attained despite the variation in groupings or categories. The same result is indicated in the ANOVA (Analysis of Variance), with F(64,435) =.901, p =. 689. This means that the number of hours has nothing to do with online learning, students could open their assignments and lessons any time of the day and submitted on the stated deadlines.

D. Differences in the Online Teaching Engagement

The t-test result of the differences in the online teaching of the different groupings of instructors presents "no significant differences." This means that male or female, rural or urban, young or old, master's or doctorate instructors were conscious of their responsibilities and accountabilities in teaching especially amid the pandemic (t-values = -.848, -.656, 1.884, and 1.236; p = .400, .515, .165, and .222). The ANOVA indicates also the same result when it comes to the number of years (F = .948, p = .558). This signifies that the instructors in the private maritime university exercised their teaching activities, lessons, and follow-ups to the maximum level to prepare the students for their future careers.

E. Views on Online Learning Situation

The qualitative views shared by the students regarding online learning at a maritime university in the Philippines were the following: (1) easy to access and flexible, (2) helpful and useful to the students, and (3) encourage participation.



F. Concerns in Online Learning Situation

However, some participants expressed also their concerns about their online learning such as (1) online is very challenging, (2) expensive and needs extra money, and (3) online is not enough for learning especially in dealing with laboratory activities.

(1) Online is very challenging. This is supported by the following statements *as this is difficult for me because I live on the farm, and I have to go to the municipality or city to have a connection to attend my class (Amop na mabudlay sa taga-uma pareho ko kay madul-hog ka guid sa banwa para lang maka kuha ka sang signal kag maka attend sa klase mo); sometimes the system is not functioning well (Ga-bisyo ang system kong ka-isa); the apps are good and ok but sometimes it mal-functioning and causes delay (Ok ang apps pero ga bisyo kag ga delay perme); it is difficult to understand, but, sometimes it seems ok (Indi mayo ma-intendihan, pero daw ok* man kong ka-isa); *the site crashes sometimes when answering the assignments and exams*

(2) Expensive and Extra Burden. These concerns are reflected in the remarks of the respondents such as the following: *using online platform is costly; it needs extra money for loads in order to attend the class online.*

(3) Online is not enough for learning especially in dealing with laboratory activities. This is supported by the following: *t is good, but how can we apply the knowledge in the lessons if there will be no actual activities; sometimes it is boring, perhaps there should be physical (Kong ka-isa boring man, tani may ara); online is not enough for us, marine engineering students need actual and physical laboratory because of the nature of the profession (Online ay d guid enough, kami naga kilalan sang actual kag pisikal laboratory kay amo na ang nature profession).*

G. Views of Online Teaching Engagement

Table 1: Respondents' Views about Online Teaching

Comments on Online teaching using JEL	%	R
1) Helpful tool for students learning	40	1
2) Innovative & appropriate teaching method/strategy	35	2
3) Explorative	25	3
Total	100	

Interestingly, one of the themes emerged from the views of the respondents that online teaching is a "helpful and good tool for students learning" as supported by one of the statements of the respondents, which states that, "online is very helpful in the learning process of the students."

Some people may state that the "teacher could be identified the way he teaches," it appears that the respondents considered this "Online teaching" as an "innovative and appropriate teaching method." Students find this method appropriate and excellent for catering to students' needs in terms of learning in the university. The comments on online teaching as an "innovative and appropriate teaching method" is supported by the following statements: "very appropriate teaching method under this pandemic"; "good innovation, it is easier to track the objectives of the lessons and quizzes, "and "user friendly, it is easy to access and provides relevant functions as needed."

According to the instructors, this activity is explorative because this online platform is a new model of instruction to the instructors. The instructors applied the "trial-and-error approach" to be familiarized themselves with the functions and commands of the online platform.

H. Perceived Indicators of Good Online Teaching

In this particular study, the result revealed that effective teaching styles could be a good tool for online teaching; this means achieving the lessons' objectives. Therefore, teachers explore and identify appropriate teaching strategies. As stressed by different studies in the field that "discussion is considered as a beneficial method of the instruction instead of a lecture, in which the students study the course contents before the class, satisfied with the online teaching method, and should be continually applied in teaching online in the university (Hu, Song, Chai, & Gong, 2020; Balouch, et al. 2019; Asdaque , Khan, & Rizvi , 2010; Tabanda, et al. (2014); Ivwighreghweta & Igere , 2014; Colombo, 2020). Some of the indicators were technical skills, environment, integration of values and virtues (to be honest for answering assignments), and time management.

Table 2: Perceived Indicators of Online Teaching in Maritime University

Indicators on Online Teaching using JEL	M	R
Effective teaching strategies in online classes	4.52	1
Technical skills (using FB, Zoom, etc)	4.31	2
Disturbance-free environment	4.25	3
Integration of values & virtues	4.21	4
Time Management	4.20	5

I. Perceived Challenges of Online Teaching

The results revealed that dealing with online teaching entails several challenges. In this particular study, the authors found out that interruption and the unstable signal is the first challenge for the instructors in JBLFMU-Molo; this may be because, in the Philippines, the Internet is not stable and robust as compared in highly developed countries like the USA, Canada, Japan, and others. This result is followed by technical issues, and abrupt loss of connection while discussing the topics. The third one is the "unpreparedness of instructors" because of this sudden change of mode of instruction. The last one is about the maintenance conducted by the university's technical staff to see to it that "online teaching will be delivered" to the students. The challenges in dealing with online teaching are discussed with the academic department heads and several strategies and programs will be undertaken.

Table 3: Perceived Challenges of Online Teaching

Challenges to Online teaching using JEL	%	R
Interrupted & unstable signal in starting the class	45	1
Technical issues (sudden offline) in the middle of online class	25	2
The unpreparedness of the users/teachers	15	3.5
Offline due to maintenance of JEL	15	3.5

Implications for Institutional Development

The results obtained in this study had led the private maritime university in the Philippines towards intrinsic and extrinsic institutional development such as the following: the reflection on online learning, feedback on the online learning and teaching, assessment of the online strategies of the instructors and students that would lead to quality of the learning-teaching situation, which has been achieved to the potential. Moreover, due to the results of this study, various institutional development activities and programs will be conceived such as the following: (1) offering enhancement programs of maritime education, especially for non-maritime students (first-year students from non-maritime schools) who will be enrolling in this private maritime university, (2) extensive review classes will be conducted to increase the company-sponsored scholars, (3) dialogues and symposia will be scheduled to further solicit the ideas and feedback from the different stakeholders towards the curriculum development and enhancement, (4) new maritime related-courses will be offered in the next school year.

Conclusion

Based on the findings of the study, the conclusions were advanced:

The very high results of the respondents' assessment of online teaching using were influenced by the concerns and aims of the administration of John B. Lacson Foundation Maritime University-Molo as the only maritime university in the Philippines in helping the instructors use this new method of teaching amid a pandemic. The results of "no significant differences" existed in the assessment of online teaching means that the respondents' categories do not influence the good level of assessment of the instructors. It means further that male and female instructors considered this online platform as a new teaching method and very useful to them to deliver the intended-learning objectives (ILO) and achieve the

objectives of their lessons through their teaching methods. The respondents' views such as "helpful tool for students' learning, innovative teaching style, and explorative" were supported by exploring the indicators of this particular study such as "effective teaching strategies, technical skills, environment, integration values and virtues, and time management." These results were in the same vein as the studies of Chen (2020), stressing that teachers are trained to master the mode of networking-teaching; they were trained to do it in a very constructive way. Teachers' level of teaching was improved, changed, and enhanced; the positive correlations among the teachers' adaptability, teachers attitude, and teaching effectiveness as also supported in the different studies by Alshehri, Mordhah, Alsibiani, Alsobhi, & Alnazzawi , 2020; Study of Wu, Guo, & Wang , 2021; Pardino, Gleyzer, Javed, Reid-Hector, & Heuer, 2018; Cao, Xie, Zhou, Gong, & Gao, 2020; Akhler, 2013, Fatima, Nasreen, Parvez, & Rahaman, 2020; Colombo , 2020. Specifically, Colombo's (2020) study agreed with the results of this study as stated in the author's statement that "online education is no longer a new phenomenon, and this method has the potential to exceed the traditional or person-to-person education. Therefore, teachers can access the Internet and its usability anywhere and anytime.

Recommendations

After analyzing and interpreting the results of the data and framing the conclusions of this particular study, the researchers would suggest the following:

The administration of JBLFMU should sustain the favorable results of online teaching-learning in the maritime university as the only maritime university in the Philippines.

Qualitative statements and views of the respondents should be given attention despite that the quantitative results of the online learning and teaching were favorable to re-discover other factors about the instructors' delivery to optimize learning in the South East Asia region.

The Academic Council shall discuss the results to improve the faculty members' online instructional delivery.

The suggestions and recommendations of the faculty members should also be part of the academic course of action.

The researchers suggested parallel studies to determine the other factors that influenced online teaching, which is not included in this present study

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Flexible Learning in CASE UST Legazpi in the time of COVID-19 Pandemic

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ABSTRACT

The study intends to describe the flexible learning as practiced in the University of Santo Tomas – Legazpi College of Arts, Sciences, and Education (UST-L CASE) in the time of COVID-19 pandemic. To realize such, the following objectives are raised: 1. To determine the status of flexible learning in UST-L CASE; 2. To identify challenges experienced in flexible learning of faculty members and students across educational levels and various courses; and 3. To provide measures/recommendation/plan of action for the flexible learning UST-L CASE. The study provides data on flexible learning given the perception of faculty members and students, provides the status of flexible learning in UST-L CASE, and provides a literature on flexible learning in the time of COVID-19 pandemic as seen in a province-based private university. The study is anchored on two theories: Anderson's Online Learning Model and Mishra & Kohler's TPACK Model. The former is the groundwork model and the latter serves as the over-arching model to optimize the interpretation and analysis of results. The study is a quantitative research. Survey is the main data gathering tool. Questionnaire is the main research instrument via Google forms. The sample was computed using the Slovin's Formula with 5% margin of error and 95% level of confidence. Stratified random sampling is the statistical technique used. The target respondents are the faculty members and students in the entire College. The tools of analysis used are count, percentage, and mean. Confidentiality of records and anonymity/consent of respondents, objectivity and integrity of research results, and non-plagiarism are the ethical considerations of the study.

Keywords: Flexible Learning, UST Legazpi, Institutional Research, Online Learning, TPACK Model

Introduction

The school system was greatly affected by the COVID-19 pandemic across the world. Educational institutions around the world modified the way they do their education programs and activities to respond to the various protocols and systems implemented to protect the public and still promote education as a social good. Schools worldwide pushed through with the new school year given that we do not have yet reached herd immunity to counter and stop the spread of the SARS-COV 2. The Philippines did the same. The private schools started August 2020 and public schools October 2020 to address requirements given the challenges posed by online learning and module learning. The Philippines, as a developing country, adopts flexible learning for all Filipino students. With the shift to online learning and module learning, there is a huge challenge facing the Philippine education that is fully immersed to traditional modalities. The experience of faculty members and students in University of Santo Tomas – Legazpi is not different. Just like all other private higher education institutions, the University tries to establish continuity and sustainability of education programming as it fulfills its mandate to higher education by responding to the government's call to modular distance learning and online distance learning as modalities to the delivery of instruction to the students. There is a need to assess the implementation of flexible learning in the University. This study is deemed significant for it provides data on flexible learning given the perception of faculty members and students in a college, the status of flexible learning in CASE UST Legazpi; and a literature on flexible learning in the time of COVID-19 pandemic as seen in a college in a province-based private university.

The study intends to describe the flexible learning as practiced in the College of Arts, Sciences, and Education (CASE) at the University of Santo Tomas – Legazpi (UST-L) in the time of COVID-19 pandemic. To realize such, the following objectives are raised: 1. To determine the status of flexible learning in UST Legazpi; 2. To identify challenges experienced in flexible learning of faculty members and students across educational levels and various courses; and 3. To provide measures/recommendation/plan of action for the flexible learning in CASE UST Legazpi.

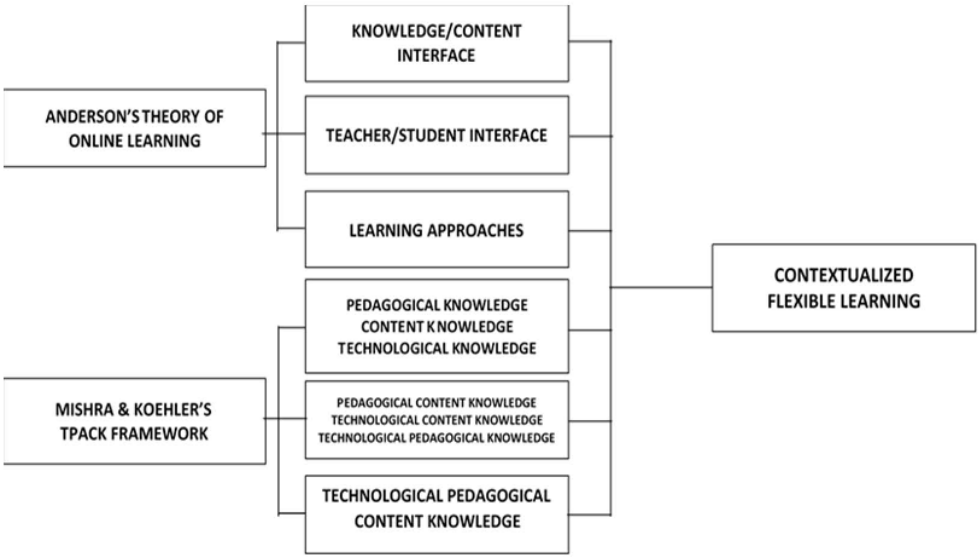

Figure 1: Theoretical Framework Model

The study is anchored on two theories: Anderson's Online Learning Model and Mishra & Kohler's TPACK Model. The former is the groundwork model and the latter serves as the over-arching model to optimize the interpretation and analysis of results. The study considers these two theories as two perspectives in order to have a good analysis of flexible learning this time of pandemic in the Philippine

context. Terry Anderson's Theory of Online Learning provides us the necessary dynamic interplay between and among teachers, students, and content to generate solid interfaces between and among them resulting to collaborative learning, independent study, structured learning resources, and community of inquiry. Punya Mishra & Matthew J. Koehler's TPACK Framework provides the three necessary elements to have a successful online/flexible learning which are content, pedagogy, and technology producing pedagogical content learning, technological content learning, and technological pedagogical knowledge leading to the core principle of technological pedagogical content knowledge.

Anderson's Theory of Online Learning is fundamentally a model on e-learning demonstrating the interactions of learners and teachers relative to the knowledge/content. For Anderson, there are four overlapping components in effective learning environments. These are community-centered learning, knowledge-centered learning, learner-centered learning, and assessment-centered learning. Online learning communities can and should share a sense of belonging, trust, expectation of learning, and commitment to participate in and contribute to such communities and therefore students work together online to create new knowledge collaboratively. And whether the context is online or school-based, the internet provides a huge amount of information that provides opportunities to gather these resources and therefore learning becomes making connections with ideas, facts, people, and communities. This should not lose the premise that school stakeholders must provide strong support to students. The teacher, school, and the society itself have to create successful learner-centered environments and in effect create meaningful connections to the communities. With varying multiple modalities, formative and summative evaluation have to be part of the entire schema to ensure that targets and competencies are reached making the gap between the traditional and alternative modalities narrower. With these four lenses, education has to recognize the role of interactions in online learning. There has to be student-student interaction (which basically is collaborative learning), student-content interaction (which consists of interactive knowledge and customization of content), and student-teacher interaction (which defines the relationship between them in actual teaching and learning experience. The model in general is a multi-component learning environments enhancing the critical interaction in education in many varied creative ways. The Anderson Model is crucial in the paper for it highlights four components that underscore Philippine education contexts.

The TPACK Model is an integration framework of technological, pedagogical, and content knowledge. As a framework, it affirms three primary forms of human knowledge, which are content knowledge, pedagogical knowledge, and technological knowledge. This TPACK Model provides us a more complete understanding of teaching with technology. Content, pedagogy, and technology have to blend to provide a better learning experience for students. It centers on digital pedagogies focused on cooperative learning and realization of desired learning outcomes. The TPACK Model is significant to the paper for it explains the interaction of content, pedagogy, and technology.

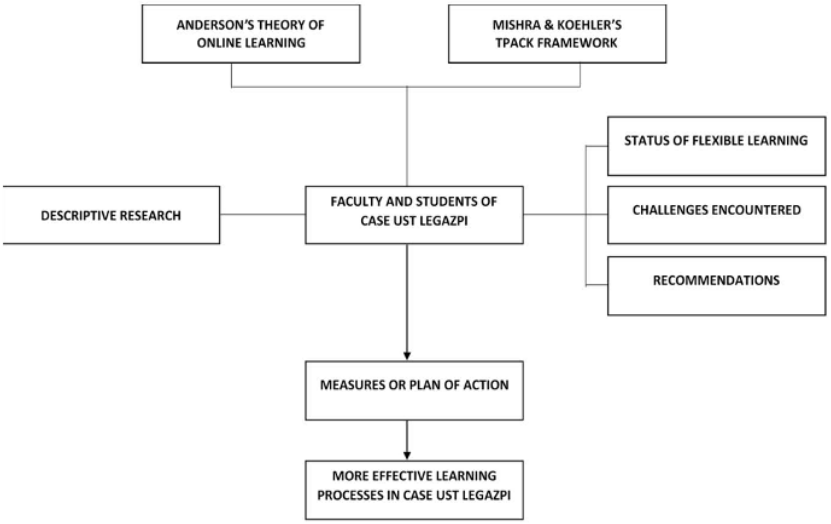

Figure 2: Conceptual Framework Model

The study on flexible learning in CASE UST Legazpi education system is anchored on two major relevant theories on contemporary teaching and learning and flexible/online/distance education: Anderson's Theory of Online Learning and Mishra & Koehler's TPACK Framework. It focuses on the determination of the status of such flexible education in UST Legazpi, identification of the challenges encountered both of faculty members and students, and provision of measures or plan of action for CASE UST Legazpi. This is done through a descriptive quantitative research.

Methods

The study is a quantitative research. Survey is the main data gathering tool. Questionnaire is the main research instrument via Google forms. Stratified random sampling is the statistical technique to be used. The target respondents are the faculty members and students in the Junior High, Senior High, and Tertiary departments. The tools of analysis used are count, percentage, and mean. Confidentiality of records and anonymity/consent of respondents, objectivity and integrity of research results, and non-plagiarism are the ethical considerations of the study.

Results and Discussion

Table 1: Online Learning Experience of CASE Faculty Members

No.	Online Learning Experience	Mean Rating	Description
1	My students in synchronous mode feel comfortable participating in class discussions with other students.	3.44	Moderately Agree
2	I find online classes more convenient for me as a faculty member.	3.13	Moderately Agree
3	Under online learning modality, I experience communication problems with students.	3.63	Greatly Agree
4	I think online classes are more useful as they provide greater flexibility.	2.94	Moderately Agree

5	Online classes are comparatively easy to conduct.	3.00	Moderately Agree
6	I encourage my students to look for other sources of our lessons on the net such as YouTube, online tutorials, and others.	4.34	Greatly Agree
7	I appreciate the technical help given by the University	3.72	Greatly Agree
8	I am technologically prepared in this online type of delivery mode.	3.75	Greatly Agree
9	Support and helpdesk are in place to respond to faculty members' specific needs.	3.38	Moderately Agree
10	It is easy for me to prepare my lessons since I have flexibility in time.	3.47	Moderately Agree
11	I am ready to answer questions from my students even after my class sessions.	4.16	Greatly Agree
12	I am more satisfied with teaching online as compared to other delivery methods.	2.78	Moderately Agree
13	The online tools are convenient to use and if I am lost I can ask for help from the University.	3.25	Moderately Agree
14	I give asynchronous activities that are doable within the set deadline.	4.31	Greatly Agree
15	We are given enough time to adjust to the new modes of delivery.	3.66	Greatly Agree
16	The time needed for preparation, implementation and evaluation of students' learning in online learning is higher than the traditional learning.	3.72	Greatly Agree
17	The University has offices that will take care of the students' concerns.	4.00	Greatly Agree
18	I only discuss essential topics in the courses assigned to me.	4.28	Greatly Agree
19	The University provides support by giving a router and Internet connectivity.	3.50	Greatly Agree
20	The training was given to us to facilitate an easy transition from the traditional setting.	3.50	Greatly Agree
21	I provide feedback on learning activities to our students.	3.91	Greatly Agree
22	The University has instituted policies or systems to support us in the delivery of our instruction.	3.97	Greatly Agree
23	Online learning does not significantly capture the target competencies for students as required by the courses.	2.94	Moderately Agree
24	Learning activities online are almost the same compared to the traditional classroom set-up.	2.63	Moderately Agree
25	If my students need some guidance and help regarding their studies, I am very much willing to help.	4.34	Greatly Agree
26	The University has a platform (MS Teams, Google Meet, Zoom, Blackboard LMS, etc) for online learning.	4.47	Greatly Agree
27	The platform is easy to learn because tutorials are given to students.	3.69	Greatly Agree
28	I apply several methods so that my students can learn the desired learning outcomes.	4.13	Greatly Agree
29	Students' learning in online learning is self-paced giving them flexibility and convenience.	3.94	Greatly Agree

The survey questionnaire on Online Learning Experience for teachers is consists of 29 statements that describes varied incidents possibly experienced by educators who are using the online modality in delivering their lessons. The indicators/statements can be rated using a unipolar five-point Likert-Scale in which each of the numerical value has an equivalent adjectival description in terms of extent of agreement specifically 1 – Not at all, 2 – Slightly Agree, 3 – Moderately Agree, 4 – Greatly Agree, and 5 – Completely Agree. Thirty-two (32) faculty members of CASE answered the survey questionnaire online.

The average rating of the respondents was computed for each indicator to determine the overall evaluation of the teachers. Ten (10) out of 29 statements obtained an average rating within 2.50 – 3.49 which means that the respondents moderately agree on the said indicators about Online Learning Experiences. The teachers moderately agree on some statements about the practicality of online classes specifically on indicators 1, 2, 4, 5, and 10. The results suggest that the teachers in general are somehow not fully convinced regarding the convenience of online classes. The statement "Learning activities online are almost the same compared to the traditional classroom set-up" obtained the lowest mean rating equivalent to 2.63 which means that the teachers are in agreement that online learning activities are somehow different from the traditional face-to-face classes. Around 66% (19 out of 29) of the indicators registered a mean rating within 3.50 – 4.49 which means the respondents greatly agree on the majority of the online experiences described in the questionnaire. The highest mean rating was obtained by the specific statement "The University has a platform (MS Teams, Google Meet, Zoom, Blackboard LMS, etc.) for online learning." The result suggests that the faculty greatly agree and are unified in their opinion that the school has an existing platform for online classes.

The high mean rating (above 4.00) obtained specifically by indicators 6, 11, 14, 18, 25 and 28 is also quite notable. The result suggests that the majority of the teachers greatly agree that the asynchronous activities of the students are doable considering that the essential topics of the course are discussed and several methods are applied. Furthermore, the teachers signified that they are willing to help and are ready to answer questions from the students even after class sessions. The teachers' extent of agreement to the different online experiences stated in the questionnaire is noteworthy as denoted by the high mean ratings obtained by the majority of the indicators.

Table 2: Online Learning Experience of CASE Students

No.	Online Learning Experience	Mean Rating	Description
1	I observe that the class content is implemented well in synchronous delivery.	3.45	Moderately Agree
2	The technical problems encountered in the delivery of the lessons interfere with my learning.	3.78	Greatly Agree
3	I learn in the class using asynchronous mode in as much as I learn in the traditional delivery in our class.	2.63	Moderately Agree
4	Learning taking place in online classes is not difficult and does not demand much time.	2.46	Slightly Agree
5	I observe that the class content is implemented well in asynchronous delivery.	2.94	Moderately Agree
6	I learn in the class using synchronous mode in as much as I learn in the traditional delivery in our class.	2.80	Moderately Agree
7	I am overwhelmed by the tasks assigned to me under online learning.	3.53	Greatly Agree
8	Online classes are more useful as they provide greater flexibility.	2.72	Moderately Agree
9	I have the opportunity to interact with my classmates in our class using the synchronous modality	2.90	Moderately Agree

10	I find the over-all synchronous delivery of courses during the term as effective.	2.89	Moderately Agree
11	I feel distracted and uncomfortable with the set-up under the online learning.	3.20	Moderately Agree
12	I appreciate that I can access my course online at any time given my convenience.	3.62	Greatly Agree
13	I have the opportunity to interact with my classmates in our class using the asynchronous modality.	2.71	Moderately Agree
14	I find the over-all asynchronous delivery of courses during the term as effective.	2.63	Moderately Agree
15	Online classes enable me to connect with all platforms more effectively through various options like chat groups, etc.	3.20	Moderately Agree
16	I feel isolated in my learning using the synchronous mode of delivery.	3.06	Moderately Agree
17	Collaborative learning is present in our learning activities using the synchronous mode.	3.10	Moderately Agree
18	I appreciate the support given by the University making sure that my F-DOME experience is better than I expect.	3.29	Moderately Agree
19	I feel isolated in my learning using the asynchronous mode of delivery.	2.94	Moderately Agree
20	Collaborative learning is present in our learning activities using the asynchronous mode.	2.86	Moderately Agree
21	With the synchronous mode, our class allows me to proceed at an individual pace.	3.18	Moderately Agree
22	The instructor encourages me to become actively involved in our class discussions under the synchronous modality.	3.43	Moderately Agree
23	Support and helpdesk are in place to respond to students' specific needs.	3.05	Moderately Agree
24	With the asynchronous mode, our class allows me to proceed at an individual pace.	3.30	Moderately Agree
25	The instructor encourages me to become actively involved in our class discussions under the asynchronous modality.	3.03	Moderately Agree
26	Synchronous delivery of courses is effective in preparing me in my chosen programs (i.e. Psychology, Communication, Chemistry, Teacher Education, Social Sciences, etc.).	3.04	Moderately Agree
27	Our instructors use effective teaching methods for synchronous course delivery.	3.35	Moderately Agree
28	I want to see my instructors delivering our online classes as if we are in the classroom setting.	3.86	Greatly Agree
29	Asynchronous delivery of courses is effective in preparing me in my chosen programs (i.e. Psychology, Communication, Chemistry, Teacher Education, Social Sciences, etc.).	2.71	Moderately Agree
30	Our instructors use effective teaching methods for asynchronous course delivery.	3.09	Moderately Agree
31	I think the synchronous delivery of courses is effective for student learning.	2.91	Moderately Agree
32	I find online learning not facilitative of my learning in different courses.	3.06	Moderately Agree

33	I am encouraged by my teachers to use supplementary materials for me to understand the lessons better.	3.44	Moderately Agree
34	I think synchronous mode facilitates effective learning of the course materials.	3.06	Moderately Agree
35	I think the asynchronous delivery of courses is effective for student learning.	2.69	Moderately Agree
36	The learning I receive from traditional learning is better for online learning.	3.61	Greatly Agree
37	I think asynchronous mode facilitates effective learning of the course materials.	2.69	Moderately Agree
38	I feel comfortable participating in the discussion with my classmates using synchronous mode in our classes.	3.03	Moderately Agree
39	I prefer the flexibility of taking courses in synchronous mode to the traditional mode of learning the course.	2.79	Moderately Agree
40	I am able to interact with the instructor outside of the regular class time.	2.86	Moderately Agree
41	I prefer the flexibility of taking courses in asynchronous mode to the traditional mode of learning the course.	2.51	Moderately Agree
42	I feel comfortable participating in the discussion with my classmates using asynchronous mode in our classes.	2.69	Moderately Agree
43	I receive the same quality of learning with the use of synchronous modality as I learn using the traditional mode in our classroom.	2.47	Slightly Agree
44	Live contact with fellow students using the synchronous modality helps me learn more in-class activities.	3.06	Moderately Agree
45	I receive the same quality of learning with the use of asynchronous modality as I learn using the traditional mode in our classroom.	2.38	Slightly Agree
46	Online learning in our school facilitates better delivery of faculty instruction.	3.02	Moderately Agree
47	Support structure and system is established to meet students' needs in online learning.	3.08	Moderately Agree
48	Live contact with fellow students using the asynchronous modality helps me learn more in-class activities.	2.80	Moderately Agree
49	The learning management system is convenient for the student's online learning.	3.13	Moderately Agree
50	Our learning in online learning is self-paced giving us flexibility. and convenience	3.12	Moderately Agree
51	Orientation is conducted for us to be immediately knowledgeable of and comfortable with the new learning management/delivery system.	3.41	Moderately Agree

The survey questionnaire on Online Learning Experience for students is consists of 51 statements that describe varied experiences possibly encountered by the students who are using the online learning modality. The indicators/statements can be rated using a unipolar five-point Likert-Scale in which each of the numerical value has an equivalent adjectival description in terms of extent of agreement specifically 1 – Not at all, 2 – Slightly Agree, 3 – Moderately Agree, 4 – Greatly Agree, and 5 – Completely Agree. The survey questionnaire was answered by 265 students enrolled in the different programs offered by the College of Arts, Sciences and Education (CASE). The ratings of the respondents were averaged for each indicator to determine the overall evaluation of the students.

The students slightly agree on only three (3) out of the 51 indicators concerning online learning. Statements 4, 43 and 45 registered a mean rating within 1.50 – 2.49 which suggest that most of the students gave a very low rating to the said indicators. The students in general tend to dispute the statement "Learning taking place in online classes is not difficult and does not demand much time" which implies that they find online learning demanding and difficult. Furthermore, the students are somewhat not convinced that the quality of education that they received through online platform is similar with the traditional or face-to-face mode.

Five (5) out of 51 indicators registered a mean rating within 3.50 – 4.49 which means that the students in general tend to greatly agree on statements 2, 7, 12, 28, and 36. The students confirm that they are overwhelmed by the tasks assigned to them under online learning and appreciate that they can access the course outline at their convenience. The students are also convinced that the learning they receive from traditional is better for online learning thus they want to see their instructors deliver online classes match to classroom setting. In spite of the students' inclination to online modality they still consider technical problems encountered in the delivery of the lesson as interference to learning.

The students in general moderately agree on the majority (84%) of the statements about online learning experiences as shown by the 43 indicators with mean rating of within 2.50 – 3.49. The result suggests that the extent of agreement of the students to the majority of the indicators on online learning experiences is not particularly notable.

The statement "I received the same quality of learning with the use of asynchronous modality as I learn using the traditional mode in our classroom." obtained the lowest mean rating of 2.38 equivalent to slightly agree. The result suggests that among the 51 indicators most of the students gave a very low rating to statement 45. Moreover, the students are not convinced that they received the same quality of learning even though the modalities are different.

The statement "I want to see my instructors delivering our online classes as if we are in the classroom setting" obtained the highest mean rating of 3.86 equivalent to greatly agree. The result suggests that among the 51 indicators most of the students gave a very high rating to statement 28. Furthermore, the result implies that the students want to have an online class that matches the classroom setting.

The current curricula, syllabi, and modules for the degree programs are not appropriate for an alternative system in the case of a crisis or pandemic. Infrastructures have to be built in the university level. The first thing to do is to review the curricula, revise the syllabi, and modify/reconstruct modules. The outcomes-based education framework totally depends on the curriculum. If the curriculum is not fit for a pandemic context, then the quality of education is compromised. One crucial issue here is how do we determine the most essential competencies to be discussed in online learning and how all other competencies are devised and guaranteed in modular learning given the presumption that by blended learning we mean online education and modular learning. The curriculum then speaks of competence of our tertiary education programming. Educational quality begins in curriculum, interpreted in the syllabus, and implemented in the modules. The second crucial issue is how content in blended learning is delivered using pedagogical approaches using technology systems and applications. Every curriculum has to show the dynamic interaction of content, pedagogy, and technology in online learning. The kind of quality we create in implementing content, pedagogy, and technology defines the level of competence on tertiary education. In effect, curricula, syllabi, and modules are designed not only for traditional style of teaching and learning. Infrastructures should be mandatory especially the necessity for information and communication technology. The University in general and the College in particular have to embrace Anderson's Online Learning Model and Mishra & Kohler's TPACK Model as the core framework for its tertiary education programming.

Learning becomes not workable given reasonable factors: strength of internet connectivity, quality of modules provided, validity of assessment, availability of learning device such as smart phone, availability of budget for net data subscription, conduciveness of respective households for learning, et

cetera. There should be modules that are standardized, normativized, and effective that are produced out of the intervention of various stakeholders. Requirements have to be simple, reasonable, and workable given time, resources, and capacity of students. Assessment should not be traditional and objective but should be authentic assessments. Digital divide should never be promoted directly and indirectly. The default system for all degree programs has to be the modules. The synchronous and/or asynchronous sessions should be made available to students but not mandatory; the university and teachers have to effectively monitor the learning progress of every student. The University in general and the College in particular have to execute Anderson's Online Learning Model and Mishra & Kohler's TPACK Model education programming.

Conclusion

The university system is greatly challenged by the COVID-19 pandemic for it actually is focused heavily on the face-to-face medium of instruction. The face-to-face approach and style is still the most effective modality given principles of facilitating, coaching, and mentoring in teaching and learning the current situation makes it not efficient. The College have to find ways to deliver quality instruction given the health crisis. The University in general and the College in particular, as predominantly traditional in pedagogy, have to design strategy in the time of this educational crisis as a result of COVID-19 pandemic. Learning becomes not workable given reasonable factors: strength of internet connectivity, quality of modules provided, validity of assessment, availability of learning device such as smart phone, availability of budget for net data subscription, conduciveness of respective households for learning, et cetera. Educational quality begins in curriculum, interpreted in the syllabus, and implemented in the modules. Every curriculum has to show the dynamic interaction of content, pedagogy, and technology in online learning. The kind of quality we create in implementing content, pedagogy, and technology defines the level of competence on tertiary education. In effect, curricula, syllabi, and modules are designed not only for traditional style of teaching and learning. Infrastructures should be mandatory especially the necessity for information and communication technology.

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Developing the Process of Standardized English Proficiency Test and Mapping onto the Common European Framework of Reference (CEFR)

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ABSTRACT

Constructing and mapping the Standardized English Proficiency Test is the stage of developing the Suan Dusit University Standardized English Proficiency Test (SDU-SEPT) under the Common European Framework of Reference (CEFR). The research objectives were to develop and map the test for a CEFR-based English proficiency test within the context of Suan Dusit University. The content validity of the test specification was evaluated by a panel of experts with the index of Item Objective Congruence (IOC) employed to measure the content validity of the test specification to qualify test topics with an IOC higher than 0.60 that were selected. The test content was divided into two sections and designed as an objective test. The first section measured language competency and under-tested the content of vocabulary, grammar, and sentence structure. The second section measured language skills: reading and listening skills, usage, and functional language of 100 items. The primary process of language test quality was mapped onto the global scale of CEFR at the A2-B2 level. Discussion of the major qualities necessary for English proficient tests, the reliability and validity of a test, and an explanation of why they are crucial are included in this paper.

Keywords: Mapping CEFR, English Proficiency Test, Standardized test

Introduction

Thailand's Minister of Education policy is to increase the English standard as a tool for international knowledge, to keep pace with the world, and to increase Thailand's competition potential in the future. In the meeting of the Office of the Higher Education Commission: OHEC No. 3/2016 and on 22nd March 2016, the OHEC imposed this policy with the goal of stringent implementation and evaluation. Based on the OHEC's policy announcement to raise English standards for higher education institutions at all levels, one of the policies is for each institution to consider the arrangement of extracurricular activities to test English knowledge skills following the institution's standard test or deem it as appropriate to test English Proficiency by comparing to the international standard of EU (Common European Framework of Reference: CEFR) or other standards to understand the ability of each student. The institutions may consider using the result of the test in the transcripts or test certificates effective from the 2016 academic year.

Origin of the Study

Dynamic and rapidly changing situations and social contexts have an effect on education arrangement at all levels. The university continues to impose clear directions and guidelines for operations of the university to achieve the goals and objectives that aim to integrate with the new way of life by improving its systems and techniques focus on the 2020 to 2024 period. The focus is on interweaving learning both in and outside the classroom through the online learning system and University learning area. Suan Dusit University initiated this with the announcement in 2020 on the subject of mandating English language proficiency tests for students. This requires students and staff to improve their English language proficiency by doing the TOEIC test that matches the CEFR standard to meet the criteria set by the university and announced by the Thailand Professional Qualification Institute committee. In this regard, the research team study is focused on developing a means to raise and improve students' abilities and improve the student English proficiency level at all levels of study with a low cost to evaluate the student's English language proficiency.

Therefore, to accomplish this, the research team has studied and designed a test model (Test Specification). This Test Specification was developed and studied in the context of Suan Dusit University and matched to the Common European Framework of Reference (CEFR). This included preparation for comparing scores on the SDU-SEPT (Standardized English Proficiency Test) as well as developing standards and a cut-off score in preparing for the English language proficiency test (Alderson, J. C. 2000).

Research scope

Creating a Test Specification was an important part of the preparation of defining and designing a proficiency electronic test. The test is named the Suan Dusit University – Standardized English Proficiency Test (SDU-SEPT) which is a test to evaluate student English language skills at Suan Dusit University and is based on the Common European Framework of Reference (CEFR). CEFR defines the test specification through the English teaching expertise and test creation by university consisting of Thai teachers and native speakers from both inside and outside the. They jointly consider the feature of the test and help to verify that the test is developed based on the test specification consisting of high competency receptive skills, which is an important research objective to evaluate English language proficiency for using English as an international language through developing an online test to evaluate the English proficiency usage in the context of Suan Dusit University based on the Common European Framework of Reference (CEFR) standard.

English language proficiency range level refers to the European Union's International Framework

The process of constructing the English Proficiency SDU-SEPT test as an evaluation test in the context of Suan Dusit University students uses the Common European Framework of Reference (CEFR) as the standard for defining and determining the characteristics of the language proficiency test. The process included input from English teaching experts and native speakers from both inside and outside the university in jointly determining the characteristics of the test and verifying whether the test was designed according to the test specification. The test is focused on the key skills to evaluate English language skills related to receptive skills and English usage as an international language, which are reading skills, listening skills, and writing skills together with grammatical knowledge through the experienced teachers in English courses, linguistics, and courses in nearby fields. The researchers and experts considered and came to the same conclusion that the test is comparable with the European international standard framework (CEFR) starting from levels A2, B1, and B2, respectively, as defined in the Test Specification.

Common European Framework of Reference for Languages

The Common European Framework of Reference for Languages (CEFR) was developed by the Council of Europe (Council of Europe, 2001) to reflect the language proficiency of language users across different European countries with the same standard. Users and language teachers can adopt such standard frameworks as a reference for interpretation and evaluation of the level of English users' proficiency at the working knowledge level to ensure common understanding based on the feature description (Descriptors) in the overview of the European Framework of Reference, which is the Global Scales for classifying English language proficiency. according to the framework for the development of English language proficiency at the higher education level.

English proficiency test development

The English proficiency test is a test created to evaluate proficiency in English with different personalities. The content of the test is focused on the level of proficiency in the English language, which determines the level of language proficiency of the test taker to determine whether the person can use the language effectively (Proficiency). In general, there are 2 forms of the proficiency exam (1) In one form the test evaluates the ability to use the English language of the test-takers having sufficient knowledge and skills to pursue a career or further their studies successfully, and (2) In another form, the test assesses whether test-takers can use the English language at the required standard. These general proficiency tests can be used to evaluate individuals in both academic and work contexts (Hughes, 2020). To create the English proficiency test, Orozco, et al. (2019) said it should be well prepared and planned to meet the needs of test users. Using the language proficiency level as a framework to create the test will help ensure the test's validity. Based on these rationales, the CEFR was adopted as a conceptual framework for the creation of the test.

The CEFR provides a descriptor that indicates a clear and comprehensive level of English proficiency in the implementation of the Orozco, et al. (2019) test that uses the CEFR as the conceptual framework to create the test. The first step is very important which is focusing on the test specification which includes a focus on the tasks, skills, or competencies intended to be tested, test types, resources of content to be used (text sources), areas of the topic, and intended level of competency. This also includes other characteristics such as duration of the test, the number of item types for the exam, length of the reading, the format of the examination, and a scoring system for defining and designing the characteristics of the Test Specification.

Methodology

Test developing cycle

This study is aimed at designing and developing a language proficiency test. It started with determining the test purposes and then creating a design statement that included a description of the examinee and other interested parties intended to benefit from the test, which includes the description of the decision to be made and the structure to be assessed (Bachman & Palmer, 1996; 2010). Once the design statement has been developed, test requirements were created to provide a plan for testing including how to write a test list, how to structure the test, and how the test taker's answers are scored (Fulcher & Davidson, 2007). Depending on the design and specification testing, list and prompt messages are collected or generated by the testing developers trained in language testing. In the next step, a pilot test is required before the test is released. In this study, a pilot test was conducted with 183 participants via an online system. Once tested, an item's stats were calculated to identify problematic items that need to be fixed or improved from testing later. It is important to note that the entire test development process is iterative, where all work is performed cyclically. Therefore, design directives and test requirements should be continually evolving, well documented, and tested through constant adaptation and changes to better suit the needs of the interested party as figure below (Sims, J. M. 2015).

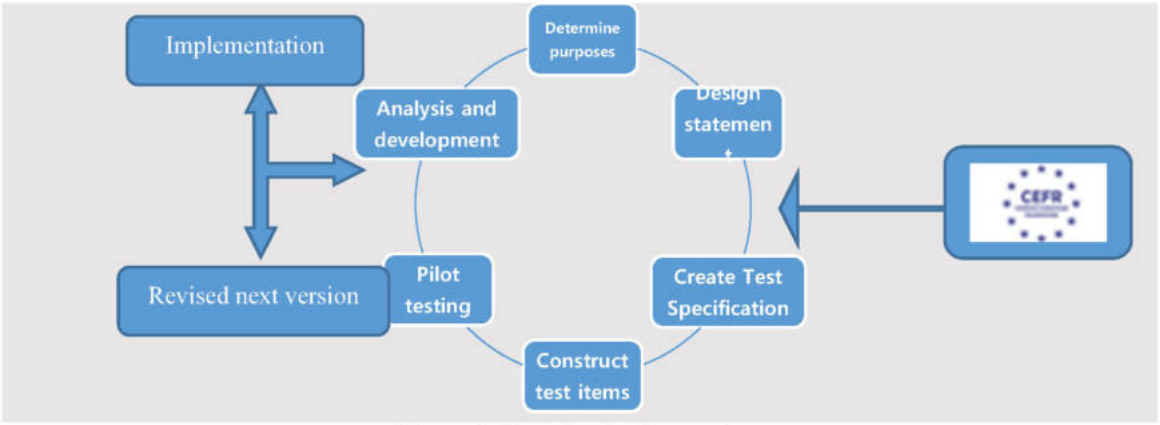

Figure 1: Test developing cycle
Source: Orozco, R. A. Z., & Shin, S. Y. (2019), p. 2

Content Validity of Test Specification of English Proficiency Test

The level of competency of a test is based on the content to be evaluated, for example, to evaluate interest as the questions in a test or exam must be a matter of interest. This is achieved by considering whether the content of the text reflects the desired concept or not. Content accuracy is therefore important, especially in the evaluation of academic achievement. Whether the evaluation of teaching and learning outcomes using the test does not match or does not cover the content learned is a measure of inconsistency with the content integrity test (O'Loughlin, K. 2013). This can be done by considering the process of creating a test or exam whether it assesses what you want to assess or not or by examining the answers to the facts that appear, such as observing the behavior that occurs following the behavior answered in the test. Such a testing process requires content experts to verify the test creation process to decide whether the questions in the test can represent the content being asked or not. This is done by comparing what appears in the test with what should be asked to see how consistent they are. This type of testing for content validity by experts is known as IOC (Index of Item-objective Congruence)

The process of creating and defining the Test Specification of the English proficiency test follows the process steps:

1) Studying the criteria standard of the European Framework of Reference (CEFR) and its context in English language use, English teaching management of Suan Dusit University.

2) Designation of the Test in optional formats, assigning options and English language skills to be assessed.

3) Developing a test by making a Test Specification and experimenting with a sample group of students from the study of documents related to the development of the English proficiency test. Based on the Test Specification pre-requisites, the research team set the steps for creating the Suan Dusit University English proficiency test as follows:

i. ***Defining attributes of the test specification.*** The faculty of experts reviewed the descriptions of the English proficiency levels outlined in the European Standards Framework of Reference (CEFR) at levels A2, B1, and B2 and determined the objectives of the test. This covers the language elements (structure/lexis/notion/functions) and language skills to evaluate the format of the exam, the scope of content, type of activity, number and weight of questions, test methods, descriptions, evaluation criteria, scoring, and descriptions for each English language proficiency level to determine the proficiency range of the SDU-SEPT English Language Proficiency Test.

ii. ***Meeting the committee to create the test.*** The purpose of this step was to elaborate on the features of the test and the procedures for its implementation to the test creation committee in full detail as well as jointly study the context of students' use of English, such as the content of teaching and learning, use of books, teaching and learning management model of the English language subject group in the general education category, English Language evaluation and Assessment of the student. Guiding the creation of tests is the European International Standards Reference's CEFR (Brown, H. D., & Abeywickrama, P. 2010).

iii. ***Committee created the test based on the attribute of the test specification.*** Content Validity determination is undertaken by the researcher-led testing supervised by the committee which is an expert to assess the consistency (IOC: Index of Item Objective Congruence $IOC = \frac{\Sigma R}{N}$) of the test with the description of the proficiency level defined in the CEFR to determine the conformance index as an expert determination of the accuracy (North, B. 2014). This is done by considering whether each exam or question is evaluated according to what you want to evaluate in content or learning objectives by using the assessment criteria with the information obtained taking into consideration the experts' opinions in finding the correspondence between each question and purpose or content (Index of Item-Objective Congruence or IOC) with the sum of expert review scores N representing the number of experts. For this study, there were 3 experts with more than 10 years of experience at the Ph.D. level who held the position of Assistant Professor English in Applied Linguistics and in teaching English as an International Language and Eminent Persons who were familiar with the use of English in the process of teaching English in the context of Suan Dusit University. The IOC Judgment Criteria at a range of 0.60 or higher, means the question set in the Test Specification can be measured exactly for the purpose and according to the content showing that the question can be used and can be improved and developed according to the advice of experts and according to the results of the study at all items over 0.60 as test details of Version 1 follows:

Table 1: SDU-SEPT-Vocabulary Session

20 Items Timing 30 minutes	Vocabulary level at A2-B2, reference profile on Cambridge Dictionary online	12 items	12 tasks	Multiple Choices: a word or phrase which completes the sentence with four choices	Understanding lexical appropriacy in the discrete sentences
	Vocabulary level at A2-B2, reference profile on Cambridge Dictionary online	12 items	12 tasks		

Table 2: SDU-SEPT- Part 2 Grammar and structure

20 Items Timing 30 minutes	Parts of speech 1.1 Adjectives – comparative, – use of "than" and definite articles 1.2 Adverbial phrases of time, place, and frequency – including word order Adverbs of frequency 1.3 Conditionals, 2nd and 3rd Connecting words expressing cause and effect, contrast, etc. 1.4 Connecting words expressing cause and effect, contrast, etc. 1.5 Modals – can/could Modals – have to/should 1.6 Punctuations	8 (1 item) (1 item) (2 items) (1 item) (2 items) (1 item)	8 (1 task) (1 task) (2 tasks) (1 task) (2 tasks) (1 task)	Multiple Choices: an error correction item with four choices	Using English at the word or sentence level, including the use of correct structural words and forms; correct and appropriate words and sentences; variety of forms in expressing similar meaning; application of word derivation.
	Tenses 2.1 Past continuous and Past simple 2.2 Present perfect continuous and Present perfect/past simple 2.3 Will and going to, for prediction 2.4 Reported speech (range of tenses) 2.5 2Future perfect	7 (2items) (2 items) (1 item) (1 item) (1 item)	7 (2 tasks) (2 tasks) (1 task) (1 task) (1 task)	Multiple Choices: a sentence and ask them to choose which of four alternatives has the same meaning	
	3. Active and Passive voices	(2 items)	(2 tasks)	Multiple Choices: a sentence and ask them to choose which of four alternatives	
	Phrasal verbs, extended	(2 items)	(2 tasks)	Multiple Choices: a sentence and ask them to choose which of four alternatives	
	Wish/Would expressing habits, in the past	(2 items)	(2 items)	Multiple Choices: a sentence and ask them to choose which of four alternatives has the same meaning	

Table 3: SDU-SEPT- Part 3 Reading skill

20 Items Timing 40 minutes	A longer text with six questions	(1 item)	(6 tasks)	Twenty discrete four-option with Multiple-choice items.	Reading to identify: • main message • purpose • detail Showing detailed comprehension of a text
	An Email text with five questions	(1 item)	(5 tasks)		
	A short text each with 2 questions	(1 item)	(4 tasks)		
	NEWS text each with 5 questions	(1 item)	(5 tasks)		

Table 4: SDU-SEPT- Part 4 Usage and Functional Language

20 Items Timing 30 minutes	Discuss work with a colleague	(1 item)	(5 tasks)	Multiple choices: A word or a phrase, then fill in the blank to complete the conversation with four choices	Synthesizing information in a piece of correct and appropriate extended Spoken language.
	Enquire about and negotiate special treatment (prices and conditions of sale, rates, terms and conditions)	(1 item)	(5 tasks)	Multiple choices: A word or a phrase, then fill in the blank to complete the conversation with four choices	Synthesizing information in a piece of correct and appropriate extended Spoken language.
	Complain and negotiate redress (poor service e.g. returning faulty, inappropriate or unwanted goods and negotiating for a replacement or refund)	(1 item)	(5 tasks)	Multiple choices: A word or a phrase, then fill in the blank to complete the conversation with four choices	
	Express regrets and negative wishes or intentions	(1 item)	(5 tasks)	Multiple choices: A word or a phrase, then fill in the blank to complete the conversation with four choices	

SDU-SEPT Testing Quality

The quality of one-question exams is to bring the test series into the standardization process and to compare the scores of the SDU-SEPT test with the Common European Standards Framework of Reference (CEFR), which is the order of study and development to be discussed in the following steps:

1) Descriptive statistical analysis to determine minimum value, maximum value, distribution, percentage, mean, standard deviation, error ratio, and standard error

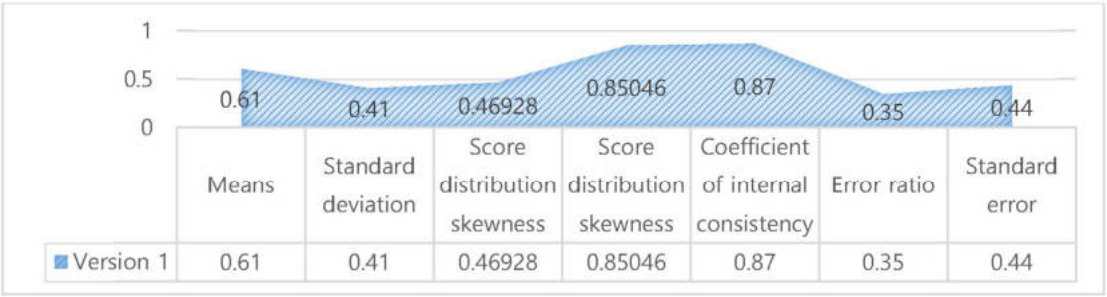

Figure 2

2) Analyzing the item exam to analyze basic information, determination of difficulties, determination of classification power, and the opportunity to guess at the average of the whole exam with Cronbach's alpha reliability Coefficient of internal consistency was $r = 0.87$According to Hughes (2003)

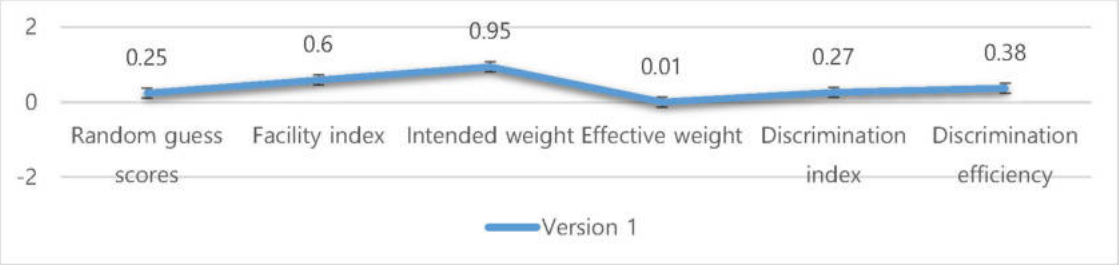

Figure 3

Mapping the SDU-SEPT and the criterion Standards (CEFR)

Tannenbaum & Wylie, (2013) said, there are several methods for comparing the scores of the English proficiency test with the standard frameworks. The researchers selected the Modified Angoff method as a suitable method for the Receptive skills test. Wudthayagorn, (2018) used an optional test format (Multiple Choice) that is based on the opinions of 12 language teaching and linguistics experts. There is a consensus on which test-takers will fall into the A2 to B2 grade and whether they can pass the exam and what percentage of their accuracy will be.

Panelist

Twelve educators served on the standard-setting panel. Twelve educators reported being either full-time ESL/EFL teachers; they reported having at least 10 years of experience teaching ESL/EFL. As the criteria set for consideration are: faculty member in a Bachelor of Arts program English Language Business English Language and Communication and other related fields and/or has at least 5 years of experience teaching and designing English language tests at a higher education PhD.

Preparation

To compare test scores with the European Framework of Reference for International Standards. The research team adopted the Modified Angoff-Based Predictions of test Items Performance method because it is suitable for the multiple choice test and only 3 intersection points or cutscores are specified, namely A2, B1, and B2. The researchers describe the overall characteristics of the standard framework of European International Reference (CEFR) Council of Europe. (2001) and an overview of students' English proficiency (Plake, et al. 2000). Suan Dusit University and provide opportunities for discussion and exchange teaching experience of teachers who have taught students of different faculties that different English proficiency is possible. This is to understand the nature and abilities of students of Suan Dusit University and visualization of the lowest competency of that level (Just Qualified Candidate) match. Key questions in the implementation of Modified Angoff-Based Predictions of test scores are compared to CEFR; A2, B1 and B2 levels (Baron, P. A., & Tannenbaum, R. J. 2011, Bonnet, G. 2007)

Standard setting

The fundamental standard-setting judgment was for each panelist to review the performance profiles and to decide on the total score most likely to be earned at the A2, B1, and B2 levels. As before, the

A1, B1, and C1 cut scores were slotted. Two of three rounds of opinions were cast to reach a consensus and the average of each test in three rounds was referenced to analyze the intersection of each grade level according to the CEFR. Standardization is divided into four steps as follows: 1) Preparation 2) Panelists worked in 3) Standard setting 4) Adjustments based on perceived alignment to the CEFR. (Alderson, et, al 2006; Athiworakun, et, al. 2018; Plake,et, al. 2000; Tannenbaum, R. J., & Baron, P. A. 2008; 2010; 2013; 2015).

The standard-setting task of a panelist was to find the cut-off scores according to the CEFR what percentage of students with the lowest A2-B1-B2 proficiency in Round 1 is likely to be correct on the Exam each test item of test to reach each of the targeted CEFR levels with 5 increments from 0, 5, 10, 15, 20, 25, all the way up to 100. The 12 panelists engaged in a discussion of the Round 2 results and classification estimates and then made a final set of judgments (Round 3). In Round 3, 12 panelists were asked to make holistic cut-score decisions for the overall test section. Specifically, 12 panelists were asked to review the JQC definitions for A2, B1, and B2 CEFR levels and to adjust their Round 2 A2, B1, and B2 cut scores.

Discussion

However, the linking difficulty is also a function of the tests, specifically with the extent to which the tests are aligned with the CEFR. It is more likely that tests developed to map to the CEFR would pose less of a linking challenge than tests not so designed, relying solely on a post-hoc approach, as was the present case. Although the tests considered in this study measured the four major language skills, all covered by the CEFR, the items, and tasks on the tests were not specifically developed to measure these skills as depicted by the CEFR. Although this did not preclude recommending cut scores for some of the levels, it was the reason for the challenges faced with the C1 and C2 levels. The value of using level descriptors to inform test development, thereby increasing alignment and the potential meaningfulness of cut scores.

Implications and Limitations

The crucial guidelines and procedures presented in this paper incorporated many of the recommendations of the publications reported in the literature review for the creation of a "single-use" proficiency test with the primary purpose of a placement exam. However, they can also serve as a model for creating other proficiency exams. For example, for over a year, the language center where this study took place is asked by the university to produce numerous "specific purposes" English exams: exit transfer exam, summer transfer exam, admission entrance exam, extension entrance exams, staff promotion exams, etc. Each year after these exams have been used, they are posted online. As a result, exams cannot be reused, and new exams must be created each year. By adjusting the difficulty level of the test content in multiuse, the program found the procedures outlined in this paper to be an effective model in the creation of these language proficiency tests (Baron, P. A., & Tannenbaum, R. J. 2011).

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Appendix A: The Results of Item Analysis for SDU-SEPT (.20-.80)

Items	Items difficulty	Items	Items difficulty	Items	Items difficulty
1	0.80	51	0.63	101	0.45
2	0.74	52	0.59	102	0.31
3	0.79	53	0.48	103	0.58
4	0.78	54	0.60	104	0.49
5	0.84*	55	0.68	105	0.44
6	0.84*	56	0.69		
7	0.74	57	0.49		
8	0.69	58	0.47		
9	0.79	59	0.59		
10	0.86*	60	0.34		
11	0.63	61	0.33		
12	0.69	62	0.30		
13	0.87*	63	0.46		
14	0.85*	64	0.49		
15	0.69	65	0.66		
16	0.84*	66	0.65		
17	0.84*	67	0.43		
18	0.86*	68	0.47		
19	0.46	69	0.37		
20	0.69	70	0.46		
21	0.83*	71	0.28		
22	0.82*	72	0.49		
23	0.60	73	0.51		
24	0.77	74	0.62		
25	0.57	75	0.33		
26	0.45	76	0.54		
27	0.66	77	0.47		
28	0.59	78	0.44		
29	0.71	79	0.51		
30	0.57	80	0.38		
31	0.54	81	0.32		
32	0.76	82	0.58		
33	0.52	83	0.34		
34	0.80	84	0.28		
35	0.59	85	0.25		
36	0.65	86	0.66		
37	0.48	87	0.33		
38	0.53	88	0.35		
39	0.25	89	0.34		
40	0.63	90	0.48		
41	0.64	91	0.62		
42	0.41	92	0.79		
43	0.83*	93	0.74		
44	0.73	94	0.62		
45	0.63	95	0.57		
46	0.56	96	0.78		
47	0.49	97	0.66		
48	0.67	98	0.66		
49	0.67	99	0.62		
50	0.56	100	0.30		

**The test items of difficulty index are under 0.20 and over at 0.80. Those items will be revised and improved.*
***n=183*

The Result of Cooperative Learning Approach Emphasizing on Team-Pairs-Solo Teaching Method for the English-speaking Skill

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ABSTRACT

Thailand is very attractive to tourists from all over the world. The situation drives Thailand to prepare its workforce in the service industry sectors like hotels and restaurants to become fluent English users. The students of Culinary Technology and Service (CTS) need English communication skills to become capable human resources in the future. The objectives of this classroom action research were: 1) to investigate the achievement of English-speaking skills of the students through a cooperative learning approach emphasizing on team-pairs-solo teaching method, 2) to investigate the level of students' progress in English-speaking skills through a cooperative learning approach emphasizing team-pairs-solo teaching methods, and 3) to investigate the students' satisfaction of cooperative learning approach emphasizing on team-pairs-solo teaching method towards English-speaking skill. The participants comprised 10 first-year students in the CTS Program, at Suan Dusit University. The research instruments were an English-speaking skills test, an English-speaking skills assessment, and the evaluation sheet of satisfaction toward team-pairs-solo activities for the development of English-speaking skills. The research relies on inferential statistics. The research results were as follows: 1) The students' achievement of English-speaking skills, after having undergone a cooperative learning approach emphasizing on team-pairs-solo teaching method had increased, 2) The students had a moderate level of progress in English-speaking skills through a cooperative learning approach emphasizing team-pairs-solo teaching methods.and 3) The students' satisfaction with the cooperative learning approach emphasizing on team-pairs-solo teaching method was a very satisfying level. The students liked cooperative learning activities that emphasized on team-solo-pairs teaching method. This is because they were active and engaged. The activities enabled team members to help each other and share ideas, which led to good teamwork. Good cooperative learning that emphasizes the team-pairs-solo teaching method can also motivate students to increase their study of English through their expression of eagerness to participate in activities that promote their English-speaking skills. It is recommended that this method be implemented with another group of students or courses to improve students speaking and listening skills. This approach can aid in achieving an increase in the fluency of speaking English.

Keywords: Cooperative learning, Team-Pairs-Solo teaching method, English-speaking skill

Introduction

English is remarkably important in the globalization era. English is the language of international communication, trading, education, culture, or traveling. English enables people, no matter where they are in the world, to communicate with each other easily. English is taught worldwide as either a second or foreign language. This is the reason why the development of English language skills is a necessity for Thai people, especially for young people who will become the future workforce of the country. In Thailand, the Ministry of Education has been aware that the English language is important for all Thai people and it makes English obligatory at all educational levels. (Sangcharoon, 2010). However, educating Thai people to use English as a second language has always been a problem. Prior research found that students and adults cannot use English properly.

The study of problems and obstacles in developing English-speaking skills of Thai university students found that students were worried about making mistakes when speaking English. Furthermore, the study showed that the barriers included inadequate vocabulary, lack of speaking practice with native teachers and others, and negative viewpoint towards English-speaking classes. (Ritthirat & Chiramance, 2014). The study of the problems and English abilities of Thai employees: A case study of Business Online Public Company Limited found employees had problems speaking English. The study showed that they could not communicate because they had no chance to use English, lacked confidence and were afraid of making mistakes, had insufficient vocabulary and grammar (Hoonnoi, 2018).

"Cooperative Learning (COL) is an instructional form of team/group effect in which students pursue a common goal while being assessed individually and as a team. This process incorporates individual interaction and accountability, mutual interdependence, face-to-face interpersonal, and regular self, and group assessment of how the team/group have functional" (Spooner, 2015). Johnson & Johnson (1991), Slavin (1995), and Kagan (1999) all stated that "Cooperative Learning refers to a systematic instructional method in which students work together in small groups to accomplish shared learning goals. The data of many research shows, that "compared with competitive and individualistic efforts, cooperation has positive effects on a wider range of outcomes." (as cited in Zhang, 2010). Johnson & Johnson (1993) suggested: "The instructional use of small groups so that students work together to maximize their own and each other's learning". Jacobs, Power, & Loh (2002) noted "Principles and techniques for helping students work together more effectively." (as cited in Jacobs, 2004)

"Team-Pairs-Solo is a strategy of cooperative learning whereby students are grouped into teams. First, they solve problems as a team, then with a partner, and finally on their own. A team works on a completion problem and then splits into pairs. Pairs work on a similar problem together and then splits into solo students who individually work on the same type of problem" Ogunleye, 2011). "Team-Pairs-Solo strategy is intended to help students to learn problem-solving skills. By working first in teams/groups or as a whole class, students work on the given task. While completing the task students discuss their ideas, and views and try to solve the problem/task. They also help each other to find the solution." (Anonymous, 2020).

The researcher, who has been teaching in Culinary Technology and Service field, has found that most of the students lack the courage and confidence to speak English. This influenced the researcher to look for new ways to improve the students' conversational skills. If the students in the field of food technology and service are good at English language skills, especially speaking and listening, it can improve their opportunities for future jobs

In this classroom action research, cooperative learning was a tool to improve English-speaking skills. While learning, students must work together to achieve the learning objectives, so this action research is consistent with the development of English-speaking skills. Speaking is one of the communication skills that require interaction and cooperation between the messenger and the receiver. The researcher expects that cooperative learning will help students improve their English- speaking skills.

Objectives of research

1. To investigate the achievement of English-speaking skills of the students through a cooperative learning approach emphasizing team-pairs-solo teaching methods.
2. To investigate the level of students' progress in English-speaking skills through a cooperative learning approach emphasizing team-pairs-solo teaching methods.
3. To investigate the students' satisfaction with the cooperative learning approach emphasizing team-pairs-solo teaching methods towards English-speaking skills.

Definition of terms

1. Cooperative learning emphasizing team-pairs-solo refers to a learning activity in which students are grouped into teams, pairs, and solo to achieve tasks or problems.
2. English-speaking skills are students' abilities of Culinary Technology and Service who have taken the English-speaking skills test and English-speaking skill assessment.
3. The achievement of English-speaking skills is the English-speaking skill score of the students.

Framework of the study

Concepts and theories of cooperative learning and the development of English language skills motivated the researcher to investigate the English learning skills of students. In this study, it is proposed that English speaking skills can be improved through a cooperative learning approach emphasizing on team-pairs-solo teaching method as shown in the framework of the study (Figure 1).

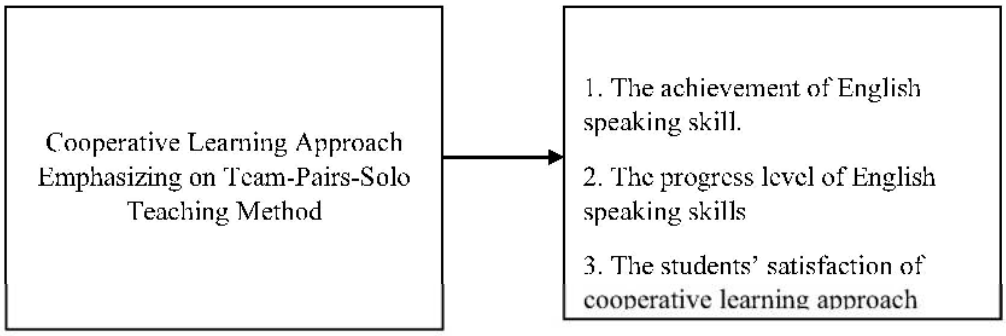

Figure 1: Framework of the study

Methodology

This research is a classroom action research. It aims to solve the problem which is the students' lack of English speaking skills in the researcher's classroom. The total students in the food safety course is 10 students. This research aims to solve the specific group's problem. The aim of the research is not to generalize the research findings to the population. Therefore, this research uses "target group" as purposive selection which was measured by using pre-test and post-test.

Target group

The target group in this research is comprised all of 10 first-year students of the Culinary Technology and Service Program at Suan Dusit University, Trang Campus. The subject under study is the class enrolled in Food Safety and Sanitation.

Research instruments

The research instrument used to attain information consisted of an experimental instrument with the lesson plan, and the data-collecting instrument: pre-test and post-test, assessment sheet, and questionnaire as follows:

1. The lesson plan for the Food safety and Sanitation subject was designed to use a cooperative learning approach emphasizing on team-pairs-solo teaching method, consisting of five contents: Food Hazard, Food Contamination, Food-Borne Disease, Personal Hygiene, and Five Keys to Food Safety. Each topic lasted 3 hours so the total was 15 hours.
2. The English-speaking skill test was a multiple-choice that consisted of five contents: Food Hazard, Food Contamination, Food-Borne Disease, Personal Hygiene, and Five Keys to Food Safety.
3. The English-speaking skill assessment sheet contained 5 areas: vocabulary, pronunciation, fluency, grammar, and time. English-speaking skill assessment was an observation conducted by the teachers and used a rubric scoring.
4. The questionnaire consisted of 2 parts. The first part was a five-point Likert scale from "1" (Completely unsatisfied) to "5" (Completely satisfied) to determine students' satisfaction. The second part was about students' opinions towards the cooperative learning approach emphasizing on team-pairs-solo teaching method.

The test was validated in terms of reliability, difficulty, and discrimination, with the questionnaire validated in terms of reliability by three experts. The researchers decided to use a paper test in order to measure the students' English-speaking skill. Most of the students do not have enough skills and confidence to speak English. This research is a classroom research which is a part of food safety subject. The students need to gain the knowledge of the theoretical content via this course. Therefore, a paper test for speaking skills was used to measure the knowledge before and after learning together with the observation. The English-speaking skill assessment sheet was used to evaluate all 5 aspects of characteristics and to measure the achievement of English speaking skills.

Data collection

This classroom action research was a one-group pre-test and post-test design. The data were collected as follows:

1. English-speaking skills of students were measured before and after students' learning in a cooperative learning approach emphasizing on team-pairs-solo teaching method in each content. English-speaking skills test was assessed by pre-test and post-test. The English-speaking skill assessment sheet was used by the researcher that observed the students' English-speaking skills while the students perform their tasks in the actual conditions (authentic assessment).
2. After the completion of all five teaching content, the students' satisfaction questionnaire was collected by the researcher.

Data analysis

1. The fundamental analysis of the pre-test and post-test was conducted by using, percentage, mean ($\bar{X}$), standard deviation (S.D), and calculation of the growth scores by relative gain scores.

2. The analyzed growth score is compared with Kanjanawasees' growth criterion. (Ahlww-Ae, 2015) are presented in Table 1: Growth score is measured from relative gain score.The students' satisfaction questionnaire data drawn from the five-point rating scale were calculated for means, standard deviation (S.D.), and ranges to interpret the level of satisfaction.

$$\text{Relative Gain Score} = \frac{Post-Pre}{Total-Pre} \times 100$$

Table 1: Criteria for growth level

Growth Score	Level of Progress
76-100	Advanced
56-75	High
26-50	Moderate
0-25	Beginner

Source: Sirichai Kanjanawasee as cited in Ahlww-Ae, 2015

Results

The achievement of English-speaking skills of the students through a cooperative learning approach emphasizes on team-pairs-solo teaching method.

The students' English-speaking skill achievement was measured before and after using a cooperative learning approach that emphasizes on team-pairs-solo teaching method. The pre-test mean score was 35.60, S.D 12.20 and the post-test was 53.80, S.D 14.46 as shown in Table 2.

Table 2: English-speaking skill achievement before and after with a cooperative learning approach emphasizing on team-pairs-solo teaching method.

The students' achievement of English-speaking skill	No. of target	Mean ($\bar{X}$)	Standard Deviation (SD)
Pre-test	10	35.60	12.20
Post-test	10	53.80	14.46

Based on the data presented in Table 2, the achievement of English-speaking skills of students after using a cooperative learning approach emphasizing on team-pairs-solo teaching method was found to have increased.

The level of students' progress in English-speaking skills through cooperative learning approach emphasizing team-pairs-solo teaching methods.

Table 3: Students' progress level of English-speaking skills with a cooperative learning approach emphasizing on team-pairs-solo teaching method.

No.	Pre-test	Post-test	Relative Gain Scores	Progress Level
1	52	74	57.89	High
2	46	69	52.27	High

3	23	42	28.36	Moderate
4	39	56	33.33	Moderate
5	55	73	51.43	High
6	43	63	42.55	Moderate
7	26	45	29.69	Moderate
8	25	37	18.46	Beginner
9	26	46	31.25	Moderate
10	21	33	17.39	Beginner
Average	35.6	53.8	36.26	Moderate

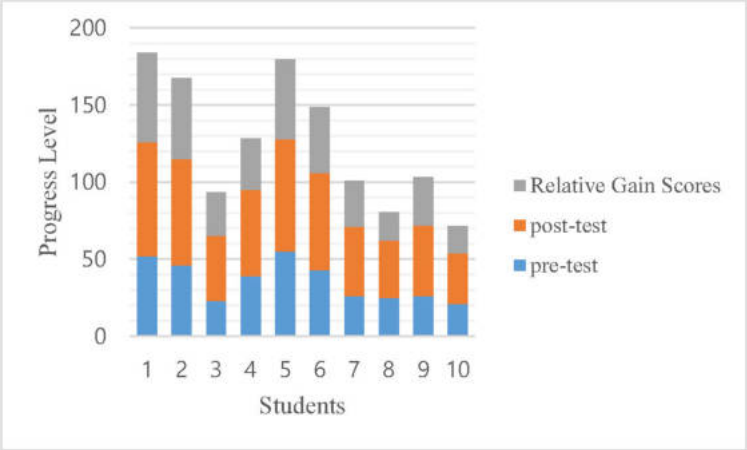

Figure 2: Progress level of pre-test, post-test, and the relative gain scores, using a cooperative learning approach emphasizing on team-pairs-solo teaching method.

Based on Table 3 and Figure 2, the results of 10 students' progress level of English-speaking skills after the cooperative learning approach found that the progress level was at a moderate level. The average relative gain score was 36.26. The results based on individual students showed; that 3 students achieved high progress' level (30%), 5 students achieved moderate progress' level (50%) and 2 students achieved beginner progress' level (20%).

The students' satisfaction with the cooperative learning approach emphasizes on team-pairs-solo teaching method for English-speaking skills.

The students' satisfaction with the cooperative learning approach showed that the mean score of the students' overall satisfaction was 3.70 a very satisfying level. The mean score of the knowledge content in the course used in the activities was 3.90 a very satisfactory level. The mean score of the team-pairs-solo activities was 3.70 a very satisfactory level. The mean score on tools used for activities was 3.50 at a satisfying level. The mean score of the students' development in English-speaking was 3.50 at a satisfying level. The mean score of the students' development of English listening was 3.70 a very satisfactory level. The mean score of the benefits that students gained from cooperative teaching with an emphasis on team-pairs-solo teaching methods was 3.90 a very satisfactory level. The results of the response are shown in Table 4.

Table 4: The students' satisfaction with the cooperative learning approach emphasizing on team-pairs-solo teaching method for English-speaking skills.

Statement	Mean	Standard Deviation	Level of satisfaction
Knowledge content in the course used in the activities	3.90	1.51	Very satisfied
Team–pairs– solo activities	3.70	1.49	Very satisfied
Tools used for activities	3.50	1.50	Satisfied
Students' development of English-speaking	3.50	1.50	Satisfied
Students' development of English listening	3.70	1.27	Very satisfied
Benefits that students gain from Cooperative teaching with an emphasis on team-pairs-solo teaching methods.	3.90	1.30	Very satisfied
Overall satisfaction	3.70	1.79	Very satisfied

The results of student's oral and written opinions on the cooperative learning approach emphasizing team-pairs-solo teaching methods showed that one hundred percent of the students approved of learning. One hundred percent of students agreed that team-pairs-solo cooperative activities were able to motivate them to improve their English. One hundred percent of students gained more confidence in expressing their opinion in English. The results are shown in Table 5.

Table 5: The students' opinion on a cooperative learning approach emphasizing the team-pairs-solo teaching method.

Students	Opinions
Question 1: Do students like the activities in a cooperative, team-pairs-solo or not? Why?	
All of the students like activities. Their opinions are as follows:	
1	It's not a boring lesson.
2	The group members can help each other.
3	The students know the strengths and weaknesses of each other.
4	They can do brainstorming, share ideas, and work as a team.
5	Students have friends to help and discuss with because I'm not good at English.
6	A student who is either slow or fluent can help each other.
7	Solo work is lonely. I like to work more in pairs and a team since it makes me think and speak better.
8	Working in pairs and a team are good fun.
9	I like it because I have someone to practice with.
10	In pairs and teams, we can be both givers and receivers.
Question 2: Can the activities in a cooperative, team-pairs-solo motivate students to improve English or not, and how?	
All of the students agree that cooperative, team-pairs-solo motivate students. Their opinions are as follows:	
1	It makes me happy to learn English.
2	I'm able to use English because I'm familiar with the language.
3	There are many interesting activities.
4	English is an international language. The more fluent we are in English, the better chance we have of getting good jobs.
5	We dare to express ourselves in English.
6	It is good preparation for future TOEIC tests.
7	I become more positive toward English. Of course, my English should be good enough so that I can become perfect through enough practice.
8	I can control myself to learn more depending on my decision and creation.

Students	Opinions
9	I prefer to have lessons in any other subjects through these similar activities.
10	The activities prepare us to work harmoniously in the future.
Question 3: Have students increased their confidence in speaking English?	
All of the students believe that their confidence has increased. Their opinions are as follows:	
1	Practice makes perfect.
2	I feel brave to express myself in English.
3	I like to take risks in creating my sentences.
4	English is not my mother tongue. Making mistakes is simple.
5	My English accent is unique.
6	I feel more comfortable talking to friends and teachers in English, but not to foreigners.
7	Better English speaking brings me a better job.
8	I will be able to communicate with foreigners.
9	There are various accents in English.
10	English is an International Language. I must be good at it.
Question 4: What kind of activities do students want to promote English language skills?	
1	Open a podcast during lunch break.
2	Discussions.
3	Playing games with English words.
4	Continuous training courses/ activities for speaking skills.
5	Learning English through fun activities.
6	Do more role-plays and simulations.
7	Self-directed learning, such as ten words a day.
8	Set up a weekly plan to become a good English learner.
9	Find/read a topic and make/write five questions to be answered in English.
10	Quiz story a day before class.

Discussion

The students' achievement of English-speaking skills through a cooperative learning approach emphasizing on team-pairs-solo teaching method.

This study showed that cooperative learning that emphasizes on team-pairs-solo teaching method can improve students' English-speaking skills. The result is in line with Slavin and Johnson's concept of cooperative learning that allows students to improve their English-speaking skills. They stated that the relationships and interactions between learners affect learning. Moreover, cooperative learning encourages students to support each other. The student's opinions in this study showed that they are consistent with the concept of cooperative learning.

In addition, the results are consistent with the research of Poolsilp and Kitisathorn who studied cooperative learning management by using a research group teaching model to promote students' English communication. The first-year students of the National Sports University Yala Campus found that post-English communication skills of cooperative learning had higher average scores than pre-English communication skills and there was a statistically significant difference at the 0.05 level.(Poolsin & Kitisathon, 2021). Sinchai and Sayankena studied the development of English-speaking skills of Mathayom Suksa 1 students using a cooperative learning approach emphasizing team-pairs-solo teaching at Ban Khon Taek School, Khon Taek Sub-district, Sangkha District, Surin Province. It was found that it was an effective teaching method since students helped each other in solving problems to achieve objectives. The method can be used to develop higher English-speaking skills for students.(Sinchai & Sayankena, 2016). Sornsilp, et al. (2014) studied a model of cooperative learning management for improving English reading skills. The subject group was Grade 3 students

who took a foreign language course. The result showed that the cooperative learning model could improve the students' learning achievement in the reading skill. The post-scores were statistically significantly higher than the pre-scores at the 0.05 level. Taotayong and Kuha studied the effect of Cooperative Integrated Reading and Composition (CIRC) on achievement in reading and writing subjects. The bilingual students were divided into two groups. The first was taught conventionally and the second was taught by using integrated cooperative learning. The results showed that the students' achievements in reading and writing through (CIRC) were higher than that of normal learning.(Taotayong & Kuha, 2011). Ogunleye, (2011) studied the result of the cooperative learning approach emphasizing team-pairs-solo teaching and personality types to determine student success and attitudes in chemistry. The study has shown that the team-pairs-solo model and student personality affect academic achievement and attitude in chemistry subjects. Teachers should use a cooperative learning approach that emphasizes team-pairs-solo with effective supervision in the best interests of all students without their personality type.

The level of students' progress in English-speaking skills through cooperative learning approach emphasizing team-pairs-solo teaching methods.

The level of students' progress in English-speaking skills through a cooperative learning approach emphasizing team-pairs-solo teaching methods found that the students had an average overall improvement at the moderate level. When considering the relative gain scores, it was found that most of the students had improvement in English-speaking skills at the moderate level (50%). A cooperative learning approach emphasizing team-pairs-solo teaching methods can motivate students to have the courage to speak English. . Therefore, it may increase English-speaking skills relative gain scores.

The students' satisfaction with the cooperative learning approach emphasizes on team-pairs-solo teaching method for English-speaking skills.

The results of the study on the effect of using cooperative learning emphasizing a team-pairs-solo teaching method on English-speaking skill has shown that the student's satisfaction with the cooperative learning approach emphasizing team-pairs-solo teaching methods was at a high level of satisfaction which was consistent with Yan Zhang's (2010) study that found the students' satisfaction with the cooperative learning for English reading skill in Grade 9 students. Participatory foreign language teaching has a positive effect. When compared with original language teaching, cooperative language learning was more advantageous than original teaching. By engaging in language learning, students are academically literate as they also have interactive skills. It showed that cooperative learning is beneficial in many areas of language learning. Cooperative language learning is widely accepted in many language classrooms.

Conclusion

The results of the cooperative learning approach emphasizing on team-pairs-solo teaching method for the English-speaking skill are as follow:

1. Students had an increase in English-speaking skill achievement after learning through a cooperative approach emphasizing on team-pairs-solo teaching method.
2. Most students had a moderate level of progress in English-speaking skills through a cooperative learning approach emphasizing team-pairs-solo teaching methods.
3. The students' satisfaction with the cooperative learning approach emphasizing team-pairs-solo teaching methods was at a high satisfactory level. The students thought the activities in solo, pairs, and team were beneficial to them. These activities were not boring. The members of the group could help each other, shared ideas, worked as a team. Cooperative learning that emphasized team-pairs-solo teaching methods can motivate students to improve their English. The students have more

confidence in speaking English and they wanted to learn English through activities that promote English-speaking skills.

Recommendation

Based on the research result of the cooperative learning approach emphasizing on team-pairs-solo teaching method for the English-speaking skill, the researcher concurs that the use of cooperative learning is an acceptable and suitable method that can be applied in the teaching. This method can promote and develop students' English learning. Moreover, students are satisfied with cooperative activities. The researcher believes that good and suitable methods should be applied in the teaching of any subject since the development of English requires consistency and continuity.

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Do I know as much as I think I know?: The effect of the test on Thai EFL undergraduate students' perceived grammatical knowledge

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ABSTRACT

Grammatical knowledge has crucially been addressed by scholars and researchers worldwide. EFL teacher students in ELT should have an optimal level of grammatical knowledge to function successfully, particularly for their teaching career. While having a realistic perception of knowledge is critical in daily life, previous research has shown that self-perception can be illusory. However, scant research has been conducted to investigate perceived grammatical knowledge of Thai EFL undergraduates majoring in ELT. This study aims to scrutinize the Thai EFL undergrads' English grammatical knowledge measured by Test of English Grammar for Teachers (T-EGT), explore a relationship among their perceived grammatical knowledge before and after the test comparing to their scores, and examine whether the grammar test affected their perceived grammatical knowledge. The participants were 144 Thai EFL undergraduates majoring in ELT at a public university in Thailand, recruited by adopting purposeful sampling. The key findings revealed that the test affected the perceived grammatical knowledge of the participants in a positive manner that they perceived their grammatical knowledge more accurately. Moreover, the students' obtained test scores had significant relationships with both the students' perceived knowledge before taking the test and their perceived knowledge after taking the test. It also appeared that the ANOVA result indicates a statistically significant difference amongst their perceived grammatical knowledge before and after taking the test, and their obtained scores. The findings of this study have a number of pedagogical implications for future practice, as grammar instruction may benefit from students' perceived grammatical knowledge. This encourages EFL teachers to reflect on their own perceptions of grammar instruction and to employ teaching methods that take into account students' perceptions of grammar and its role in L2 learning.

Keywords: test impact, grammatical knowledge, Thai EFL undergraduate students, perceived knowledge, grammar test for teachers

Introduction

Grammar is fundamental to the acquisition of any language. Mart (2013) and Wang (2010) contend that learners may not be unable to form sentences and communicate successfully if they lack understanding of grammar. Moreover, Saengboon (2017) asserts that grammar is a sine qua non of effective language use; those learning a second language cannot progress to more complex skills like writing and formal speech without first mastering grammar. However, it seems that English language instruction in Thailand faces a difficult dilemma whereby students were first taught using the grammar translation approach and later the communicative language teaching method (Teng & Sinwongsuwat, 2015). This might result in the added dilemma of whether English grammar should be taught explicitly or implicitly (Noonan, 2005). Teaching grammar for Thai EFL students has generally been found in English lessons in Thai schools (Iamsirirak, 2021; Imsa-ard, 2020). To enhance the English grammar proficiency of Thai EFL teacher-students can contribute to their teaching ability when they are practicing teaching as a pre-service teacher and as a teacher after graduation. In international literature (Harper & Rennie, 2009), linguistic knowledge including grammatical competence has been highlighted as a crucial element for effective literacy instruction. This can be implied that teacher-students should have a comprehensive understanding of grammar before they are able to conduct their grammar instruction to the students. Nevertheless, Takahashi (2009) maintains that the self-perception of a language learner's proficiency in the target language is one of the most influential factors that may impact language learning. It should be highlighted that investigating and comparing students' self-perceptions of their grammatical knowledge with their actual grammatical knowledge might be beneficial, as it could assist teacher educators bridge such gaps.

To date, there have been several studies investigating EFL students' grammatical knowledge in various contexts, particularly in terms of its prediction on students' English proficiency. For instance, Aryadoust and Baghaei (2016) examined the relationship between reading comprehension and lexical and grammatical knowledge among 825 students of English as a foreign language, using an Artificial Neural Network (ANN) consisting of a second-language reading test and a set of psychometrically validated grammar and vocabulary tests, they. Their findings revealed that ANN accurately categorized around 78% of readers based on their vocabulary and grammatical knowledge. This conclusion is consistent with cognitive models of reading that consider the lexical and grammatical knowledge of learners to be a significant component in separating poor readers from proficient readers. Similarly, Hayyi (2014) investigated the relationship between the grammatical knowledge and writing ability of 36 students in the twelfth grade at a Senior High School in Bandung, Indonesia. The results demonstrated a substantial correlation between explicit grammatical knowledge and writing ability among EFL students. Thus, it is possible to indicate that grammatical knowledge plays a vital role in language learning. However, self-perceptions of competence may not always reflect reality as one might not be aware of their unskillfulness (Kruger & Dunning, 1999). Overestimation of one's abilities may have disastrous effects, known as the Dunning-Kruger effect. To elaborate, the Dunning-Kruger effect implies that persons with lower skill or knowledge levels have unrealistically optimistic perceptions of their abilities relative to their actual abilities. With this in mind, students' realization of their own grammatical knowledge could help them bridge their knowledge gap between the targeted knowledge and their actual knowledge.

To the best of our knowledge, there has been minimal research examining the relationship between students' perceptions of their grammatical knowledge and their actual grammatical knowledge. However, comparable research has been conducted. For example, Qalavand, Srarvazad, Kalanzadeh, Bakhtiarvand, and Roshani (2013) studied the association between the self-concept and grammatical knowledge of 30 EFL intermediate university students in Iran. Their results demonstrated that students with a high self-concept were more likely to be skilled in the grammatical aspects of English. There was shown to be a statistically significant correlation between students' self-perception and academic achievement. Moreover, Santana (2019) investigated the degree to which 20 English language learners perceive their grammatical competence and evaluated English language learners' self-perceptions of their grammatical competence. The findings revealed that several students had significant difficulties with English grammar. They demonstrate deficiencies in the learning of English grammatical structures.

According to Iamsirirak (2021), 144 teacher students majoring in English in one public university in Bangkok, Thailand were investigated for their English grammar proficiency by the Test of English Grammar for Teachers (T-EGT). The findings were displayed in three proficiency levels: beginner, intermediate, and advanced. The result showed that most of the teacher students were intermediate. However, the percentage of each level was similar as found in 33.33, 34.03, and 32.04 for beginner, intermediate, and advanced respectively. The results from the prior study showed the similarity of English proficiency of student teachers. Therefore, it is intriguing to thoroughly investigate and classification of student teachers' grammar proficiency into six bands as found in Khemanuwong *et al.* (2020) which investigated the reading comprehension proficiency of Thai engineering undergraduates.

Although extensive research has been carried out solely on students' grammatical knowledge, there has been little examination of the relationship between students' perceived and actual grammatical knowledge. Thus, a comprehensive understanding of the relationship between students' perceived and actual grammatical knowledge is still inadequate. Numerous research studies have been undertaken on teaching grammar, but fewer studies have examined English language teacher-students' grammatical knowledge and their perceived knowledge. This demonstrates the necessity to understand such issues among EFL students to assist them in improving their English language skills and using it effectively. In light of its importance, this study is purposely to investigate the relationship between English-major teacher students' self-perception and their existing knowledge of English grammar proficiency. This present study intends to shed light on the grammatical knowledge of teacher students by addressing the following research questions:

1. What is general grammatical knowledge of Thai EFL teacher students measured by the T-EGT?

2. Is there any relationship among their perceived grammatical knowledge before and after the test and their scores?

Methodology

This part is to declare research design, participants, research instruments, data collection and data analysis for this study as follows.

Research design

This study is purposely to investigate the relationship between English-major teacher students' self-perception and their existing knowledge of English grammar proficiency. Therefore, this study espoused a quantitative research approach to address the research question. The research was conducted via online data collection by using questionnaires. The scale of perceptions was designed with a 6-point scale from 1 to 6 - the highest to the lowest relevant to the levels of English proficiency which were divided into 6 bands from very poor to advanced. As a consequence, the T-EGT was adopted in this study.

Participants

In this study, there were 144 Thai EFL undergraduates majoring in English in the Faculty of Education at a public university in the north of Thailand, recruited by adopting purposeful sampling. The adoption of purposeful sampling is necessitated by the identification and selection of information-dense cases associated with the phenomenon of interest. To elaborate, the sample in this study was representative with respect to the major of their study, related to English language teaching.

Research instruments

The research instrument in this study is an online questionnaire via Google Form. There are three parts: 1) General information of a participant, 2) 6-point scale of the self-perception of the English grammar proficiency, and 3) T-EGT test. The first part was presented at the beginning section of the questionnaire, while the second and third parts were combined to facilitate the participants marking their self-perception together with taking the multiple-choice test. Therefore, the scale of perceptions was designed with a 6-point scale from 1 to 6 - the highest to the lowest relevant to the levels of English proficiency which were divided into 6 bands from very poor to advanced. As a consequence, the T-EGT was adapted in this study.

The T-EGT test is constructed based on an investigation of the needs for English-major teacher students. The needs analysis was conducted on the basis of 28 English grammar books, 60 experienced teachers' opinions, and 226 teacher-students' opinions resulting in 16 English grammar topics for teachers. The 16 topics were confirmed by 5 experts. Next, these 16 topics were used as a direction to design a set of the English grammar test for teachers. Having been composed the first set of the test, the test was delivered to 3 experts to verify the test validity. After revised based on the suggestions and comments deriving from the 3 experts, T-EGT is composed of 21 parts with 110 items: parts of speech, verbs, voices, articles, tenses, subject and verb agreement, direct and indirect speech, conditional sentences, comparison, question tag, phrases, clauses, sentence patterns, sentence types, word formation (only affixation), and parallelism.

Data collection

The data were collected through online questionnaires together with the T-EGT test via Google Form. All participants were informed about their rights to participate in this study and their rights to stop doing in case of their inconvenience. They were separated into 4 groups during the semester break within a week. They were requested not to discuss the test with other students or instructors. The test did not relate to their grade or score in any subjects. The procedure of test taking had been similarly informed to each group before data collection started. There were 110 items including 21 parts in the test with 120 minutes.

Data analysis

After collecting data, the test scores and questionnaire were calculated to explore a relationship among their perceived grammatical knowledge before and after the test compared to their received scores, and examine whether the grammar test affected their perceived grammatical knowledge. In this study, descriptive statistics (mean, percentage, and S.D.) and inferential statistics (one-way ANOVA) were performed using the SPSS software. To illustrate, students' perceived grammatical knowledge and test scores were calculated by using descriptive statistics. Regarding the examination of the relationship between students' perceived grammatical knowledge before and after the test and their scores, a one-way ANOVA was used to determine whether or not there is a difference or relationship between the variables.

Findings and Discussion

The English grammar proficiency of the participants was divided into six bands as 1) Band 1 Very Poor, 2) Band 2 Poor, 3) Band 3 Lower Intermediate, 4) Band 4 Intermediate, 5) Upper Intermediate, and 6) Band 6 Advanced. Table 1 below provides an overview of the distribution of participants within each band.

Table 1: Students' scores mapping to grammar proficiency levels

	Band 1	**Band 2**	**Band 3**	**Band 4**	**Band 5**	**Band 6**
Students' grammar proficiency level	Academic warning	Below Standard	Meet standard		Above standard	
	Very poor	Poor	Lower intermediate	Intermediate	Upper intermediate	Advanced
Score range	7 or below	8-24	25-42	43-76	77-93	94 or above
Number of students	0	1	28	107	7	1
Percent in each band	0	0.69%	19.44%	74.3%	4.86%	0.69%

As shown in Table 1, the majority of participants were classified as Band 4 Intermediate (74.3 percent). The most startling observation to emerge from the data is that only one participant was categorized as Band 6 Advanced, and there are no students categorized as Band 1 Very Poor. It appears that the majority of participants achieved the 'Meet Standard' (Bands 3-4) benchmark, 19.44 percent and 74.3 percent, respectively. The threshold for 'Above Standard' (Bands 5-6) was met by just six participants, or 4.86 and 0.69 percent, respectively. Lastly, only one participant (0.69 percent) met the 'Below Standard' (Band 2) benchmark, and none earned the 'Academic Warning' (Band 1) benchmark. From these findings, it seems to corroborate with Best's (2014) findings indicating that the majority of Thai English teachers perceived their English proficiency as 'intermediate' levels. Despite the fact that every participant was a future English language teacher, the major findings of this study indicate that pre-service English teachers still lack English grammatical competence, with intermediate levels rather than advanced levels. In addition, as mentioned by Williams (2005), pre-service English teachers are expected to have a solid grasp of grammar in order to strengthen their content knowledge and pedagogical skills so that they feel sufficiently prepared to teach grammar to their students. These results are comparable to those found in research conducted by Noom-ura (2013), indicating that classroom teachers must have a solid foundation in English grammar to contribute to their content knowledge and promote the literacy development of their students. In view of the concerns, these findings suggest that a favorable time for teachers to further strengthen their English language skills would be during their pre-service preparation (Hadjioannou & Hutchinson, 2010).

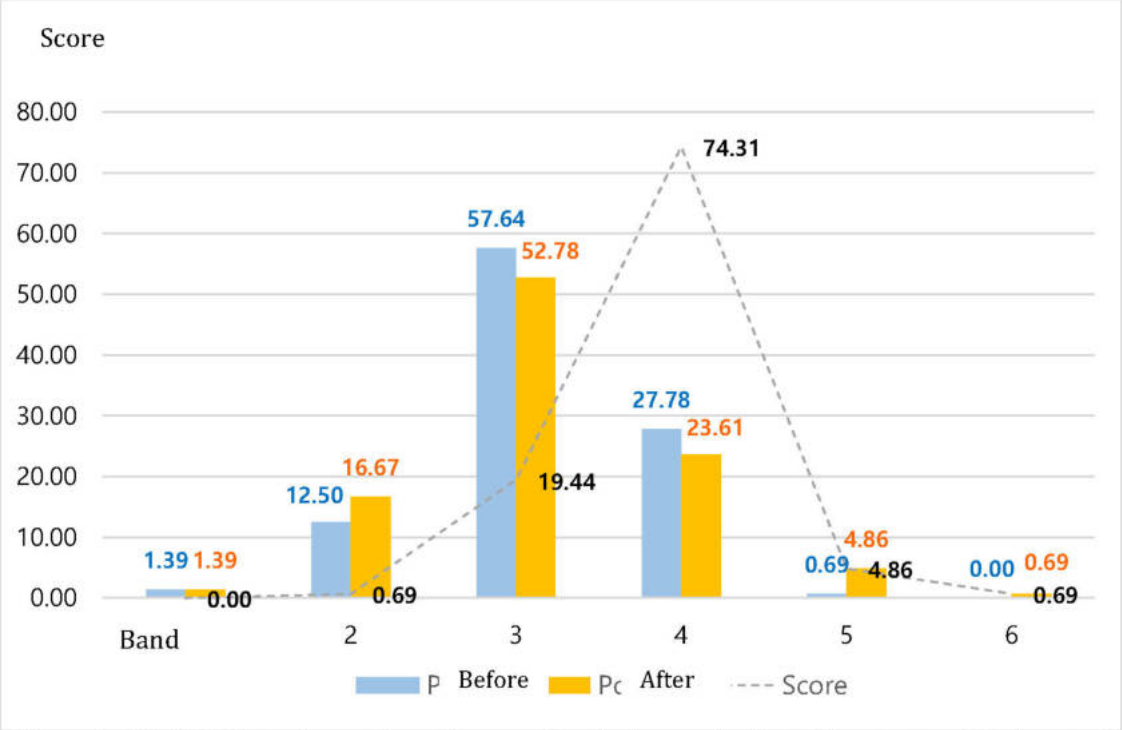

Figure 1: Thai EFL teacher students' perception before and after taking test and their actual English grammar proficiency

Remarks:
Before refers to the participants' English grammar proficiency self-perception before taking the test.
After refers to the participants' English grammar proficiency self-perception after taking the test.
Score refers to the participants' T-EGT test results.

As seen in Table 1, the average proficiency level of participants is intermediate (Band 4). Figure 1 demonstrates that the average of participants considered themselves to be at the lower-intermediate (Band 3) level before and after taking the test, with 57.64 and 52.78 percent, respectively. It may be surmised that the participants underestimated their proficiency in English grammar by one level compared to their actual proficiency level, as measured by their scores. This might be established by the gap between lower intermediate and intermediate levels of personal quality evaluation or by the humbleness of Thainess characteristics. This is in agreement with Khampirat and Bandaranaike's (2019) findings, indicating that it is probable that Thai society places a premium on demonstrating humility (Powell, Amsbary, & Hickson, 2014). In addition, concerning some changes in the perceived knowledge, the research of Wise, Im, and Lee (2021) demonstrates that disengagement from the test might have a misleading effect on test scores. Consequently, several participants in this study altered their perceptions of their skill levels after taking the test.

Table 2: A One-way ANOVA

Band	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	47.727	2	23.863	49.579	.000
Within Groups	206.486	429	.481		
Total	254.213	431			

As seen in Table 2, there was a statistically significant difference between groups as demonstrated by one-way ANOVA ($F(2,429)=49.579$, $p=.000$). This means that there is a statistically significant difference amongst their perceived grammatical knowledge before and after taking the test, and their obtained scores.

Table 3: The difference of students' self-perception between posttest and pretest

Difference	Frequency	Percentage	Cumulative percentage	Meaning
-2	2	1.39	1.39	2-band overestimated
-1	31	21.53	22.92	1-band overestimated
0	77	53.47	76.39	Actual self-perception
1	30	20.83	97.22	1-band underestimated
2	4	2.78	100.00	2-band underestimated
Total	144	100.00		

According to Table 3, the findings show most of the participants still insisted their grammar proficiency levels relevant to the posttest as seen in 53.47% of zero difference between posttest and pretest. Having been taking the grammar test, the approximate number of participants overestimating and underestimating themselves to one level of proficiency as found in 1-band overestimated with 21.53% and 1-band underestimated with 2.083%.

Table 4: The difference of students' self-perception between received score and posttest

Difference	Frequency	Percentage	Cumulative percentage	Meaning
-2	1	0.69	0.69	2-band overestimated
-1	10	6.94	7.64	1-band overestimated
0	40	27.78	35.42	Actual self-perception
1	75	52.08	87.50	1-band underestimated
2	17	11.81	99.31	2-band underestimated
3	1	0.69	100.00	3-band underestimated
Total	144	100.00		

In table 4, the results indicate that 52.08 percent of participants who took the test were likely to lower their English grammar skill to one level found in the *1-band underestimated*. Despite this, 27.78 percent of participants rated themselves accurately based on the obtained score. Nonetheless, a few of them, whose percentage of 11.81 decreased their proficiency to two levels, as shown in the *2-band underestimated*.

Table 5: The difference of students' self-perception between received score and pretest

Difference	Frequency	Percentage	Cumulative percentage	Meaning
-1	9	6.25	6.25	1-band overestimated
0	41	28.47	34.72	Actual self-perception
1	77	53.47	88.19	1-band underestimated
2	16	11.11	99.31	2-band underestimated
3	1	0.69	100.00	3-band underestimated
Total	144	100.00		

Table 5 demonstrates that 53.47 percent of participants were inclined to reduce their English grammar proficiency to one level found in *1-band underestimated* before the test. Despite this, 28.47 percent of participants rated themselves accurately based on the obtained score. Nonetheless, a few of them, whose percentage of 11.11 decreased their proficiency to two levels as seen in *2-band underestimated*.

According to the findings, it revealed that after taking the test, the participants tended to lower their proficiency level down one level. Remarkably, the findings define one thing except correct self-perception that the participants are preparing themselves to learn more knowledge. It can be assumed that they still saw themselves as a person who always provides ownself with room for improvement - not a glass-full person.

Conclusion

To recapitulate, this study aimed to examine the Thai EFL undergraduates' English grammatical knowledge measured by Test of English Grammar for Teachers (T-EGT), explore a relationship among their perceived grammatical knowledge before and after the test comparing to their scores, and examine whether the grammar test affected their perceived grammatical knowledge. This study was conducted with 144 Thai EFL undergraduates majoring in ELT at a public university in Thailand, recruited by adopting purposeful sampling with the utilization of the self-perception of grammatical knowledge scale and the T-EGT test. The key findings indicated that, according to the test scores, most participants were identified as Band 4 Intermediate, and more than three-quarters of them met the 'Meet Standard' benchmark. After taking the test, however, it appears that most participants had overestimated their skill in English grammar, and they lowered the level of their self-perception of grammatical knowledge by one level compared to their actual proficiency level. Moreover, the result revealed that there is a statistically significant difference between the participants' perceived grammatical knowledge before and after taking the test and their actual test scores. Before taking the exam, the majority of Thai EFL students in this research rated themselves as more proficient than their actual proficiency level, and after completing the test, their ratings changed. This may also be interpreted to suggest that taking the test influences the students' perception of their own performance. The findings of this study urge EFL teacher educators to be aware of their students' actual grammatical knowledge in order to provide optimal language instruction.

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Analysis of University's Globalization Discourse Using News Big Data: Focusing on Topic Modeling Analysis Methods

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ABSTRACT

This study was conducted to derive key agendas and implications for university internationalization by using news data about university internationalization to identify keywords and topics for each time period. To this end, 1,217 news reports from May 31, 1995, to December 31, 2019, were analyzed using Topic Modeling (LDA) analysis techniques, and seven topics were derived from each period, with the following implications: Analysts say that the internationalization discourse of universities is not only recognized for its importance at the university level but is also being conducted proactively at the national level. However, it is evaluated that university education has lost its direction because the discourse is passive since its specific contents are evaluated by quantitative indicators. It was followed by the fact that the paradigm for strengthening internationalization capacities is dependent on international students, that a new educational paradigm should be established, and a new dynamic of university internationalization should be created. Many articles insisted that connections and cooperation between metropolitan and provincial universities are necessary to discuss the direction of internationalization and foster global talent. Finally, while criticizing the quantitative assessments of internationalization indicators, there was self-reflection on considering individuals as instruments claiming to advocate "neoliberalism" in internationalizing the universities in Korean society. It is not about making an anachronistic fallacy of reducing the dependence on foreign students, but about identifying the role of proactive players and setting the long-term goals of university internationalization, which are the keys to university internationalization. It is important to stop expanding and supplementing short-term evaluation-oriented indicators, and reconsider colleges' reality in the long run and seek alternatives for the actors. The findings suggest the establishment of higher education policies related to university internationalization is necessary. In addition, efforts should be made to respond to the rapidly changing environment and find a direction for university education that responds to the future by examining the already constructed discourses based on social consensus on how to define and ponder upon university internationalization.

Keywords: Internationalization, University internationalization, News big data, Topic modeling, LDA analysis

Introduction

It has not been long since the need for internationalization of universities began to arise and discussed, but social consensus on the concept is not yet clear. This is because the concept of university internationalization tends to be used in combination with higher education internationalization or understood from the perspectives of "quality improvement" and "integration of international elements", thereby considered to be similar to globalization (Rhee, 2006). The influence on the neoliberal global discourse, which has been constantly raised since 1980, has also been exerted in Korea, reaching a full range from the national level including the economy, culture, and the society to the individual level (Giddens, 2003). The discourses in the Korea's educational circle, dubbed "Internationalization of Education," "Global Universities," and "Global Talents," have become a breakthrough in Korean universities' strategy to survive in growing competition with other countries. This is often referred to as the "university internationalization" (or higher education internationalization) discourse (Lee M. K., 2015).

Internationalization of universities is not just an issue for the Korean society. In the market economy, the wave of neoliberalism has raised awareness through the branding of universities, a decrease in the school-age population due to an increase in the elderly population and a decrease in the production population. Korean universities have entered the internationalization market as latecomers than advanced countries that have already begun internationalization.

As neoliberalism has affected many parts of the world, doubts about the public education system have appeared in education, and voices have been raised that efficiency will increase by raising international competitiveness and attracting talent through marketization and opening rather than excessive state intervention in education. Accordingly, on May 31, 1995, the Kim Young-sam administration's Education Reform Committee has announced the educational reform plan and implemented educational reform based on market principles, not on public education. Afterwards, he announced five educational reform plans by 1997, and insisted on fostering the desirable human character in accordance with the image of education in the era of informatization and globalization in response to the 21st century.

Neoliberalism is an ideology that the production system operates most efficiently when-the government eases various regulations, the government can implement policies efficiently by following the market principles and reducing expenditure, and that guarantees individuals liberal economic activities (Lee Y. K., 2015). Based on neoliberalism, universities are guaranteed autonomy and accountability, and they can focus on foreign students to expand the financial sources.

Opinions are divided on whether there has been an appropriate discussion on internationalization of universities so far considering its significance, purpose, and their goals to be achieved. In addition, without sharing the definition and value of the term internationalization, there are various views on whether the reproduction of competitive systems, such as increases in foreign students and campuses, is real globalization of universities or university members, or whether it has a positive or negative impact.

The purpose of this study is to empirically analyze the discourse of internationalization of universities through topic modeling analysis using news big data related to internationalization of universities, and to reflect the discourse of internationalization of universities from an educational-social perspective. Discourse contains the values, beliefs, and ideology of the society, which are formed and socialized through language, and is made through communication between people and acts as a dynamic. Discourse is a way of thinking and discussing the reality, a practice of systematically shaping the object that is being talked about, which can appear in text or communication as a conversation, or an idea or mindset that can be found in a wider social structure.

The specific research questions of this study are as follows.

First, what are the main issues that appeared in the news of university internationalization?

Second, what are the academic and policy implications of the agenda in the news of university internationalization?

Theoretical Background

In higher education, the concept of *internationalization* is commonly used similar to the concept of globalization. However, since these concepts are defined in various ways by scholars with their varying perspectives, approaches, and academic knowledge, many say that it is unreasonable to view them as a common concept (Rhee, 2006). Since the 1990s, globalization has been defined as a phenomenon in which material resources such as technology, knowledge, finance, human resources, values, and ideas move beyond the borders, and as the concept of each country's response to internationalization (Knight, 1997). Fundamental changes in higher education based on globalization, which is considered a major phenomenon in the 21st century, has already begun. The increasingly integrated trend of the global economy, as well as IT innovation, the emergence of international knowledge networks, and the role of the English language has surpassed the part of higher education institutions (Kim et al., 2013). Accordingly, internationalization refers to policies and programs implemented by universities and governments in response to globalization and is interpreted as implementing strategies to cope with pressure to open up their markets. Attracting foreign students and researchers through international education programs of the universities and implementing foreign language education in universities are considered major factors of internationalization.

The various definitions and concepts of higher education show the progress of internationalization in various areas and levels in the field of education (Scott, 2000). There are also conflicting views on internationalization of higher education, including a positive view that internationalization is a fundamental change in globalization and that it is important to develop measures for market changes, and a negative one that criticizes the reality where the universities are scrambling to catch up with the policies and education system of some of the world's leading countries along with a perspective that points out internationalization has fueled uniformed Westernization of the universities in the developing and Asian countries (Teichler, 2004).

So far, studies on internationalization have focused on the internationalization of universities and the analysis of internationalization strategies at the university level (Knight, 2005; Kim, 2011; Choi, 2008; Kim et al., 2013). Empirical studies on internationalization of universities were very insufficient, and research from a comprehensive perspective wasn't enough to establish and promote university-level strategies in the field, so it was insufficient to a certain degree to derive practical factors or strategies for internationalization. Universities are making efforts both internally and externally in competition between countries and universities, but to identify practical factors such as investment in educational administration and facilities, human and material resources, and efficient budget deployment, these efforts tended to be insufficient (Kim & Park, 2012).

In the 1990s, Korea adapted a new perspective on internationalization and tried to popularize higher education for internationalization, and discussions on the need for education and foreign language education to help understand international culture became serious (Korea Institute of Education, 1997). As the internationalization of higher education took the form of university internationalization, most of the related discourses contained similar content and had a profound impact on the domestic education policies or educational models of universities (Bu, 2006). The domestic strategy for internationalization of higher education, which has been active since the 1990s, has been steadily improving for the past

decade, showing remarkable results in terms of quantity. From a national perspective, university internationalization plays an important role in fostering global competitive talent on the international stage through exchange programs with overseas universities and disseminating the latest technologies and vast information of advanced countries into Korea (Kim, 2009). In addition, from universities' point of view, it cannot be denied that internationalization has a positive impact on university finance and management through sisterhood relations with foreign universities and sharing overseas students and research projects.

Research method

Analysis data

In general, news big data includes multimedia data, but so far, text-oriented articles take up the largest proportion, and multimedia data is generally converted into text then extracted, so the amount of multimedia data to be processed is smaller than other types of big data. Another advantage of news big data is that processing and managing them is easier than completely unstructured data because new big data have all of the unstructured characteristics of text-type data, such as date, media, and genre (Park, 2013).

This study collected Korean news articles about internationalization of universities by using the Korea Press Promotion Foundation's news big data system, "BIG Kinds". BIG Kinds is a news analysis service developed by the Korea Integrated News Database System (KINDS), which started in 1990 by the Korea Press Foundation, and is a platform that combines big data analysis technology with Korea's largest article database, including general daily newspapers, local daily newspapers, and broadcasters. Currently, BIG Kinds provides basic data to analyze social phenomena by converting unstructured text into standardized data that can be analyzed and provides valuable information from big data from about 70 million articles of 54 media from 1990 to the present. In this study, articles from 30 media outlets were collected. In addition, it was intended to increase the data validity of the analysis process by increasing the parameters of news data.

There are 24 media outlets analyzed for the collection of news data, and the status is shown in <Table 1>. To examine the discussion on internationalization of universities, the analysis period was set from 1995 to 2019 based on the educational reform on May 31, 1995, when the discussion on internationalization of universities began in full swing, and the discourse is analyzed for three periods.

The first term goes until 2004, starting with the discussion on internationalization that began with the educational reform in 1995. The second term starts from November 1st, 2004 with the start of the Study Korea Project, where the certification system for attracting international students was established. And the third period from 2012 to 2019, where interests in internationalization have increased.

Individual periods were classified based on the derivation of keywords (topics) of each period by synthesizing news big data related to university internationalization. In addition, to analyze the discourse of university internationalization, the focus was on identifying the keywords and topics that make up the discourse. Topic modeling analysis was conducted to analyze the subject of a discourse. Therefore, to observe changes in subjects related to university internationalization, the flow of university internationalization was analyzed by classifying four periods for each major topic.

As of June 20, 2022, 24 media outlets, including 9 central newspapers, 9 local magazines, 2 economic magazines, and 4 broadcasters provided news to BIG Kinds, as shown in Table 1.

Table 1: Media subject for Analysis

Type	Number of Media	Media
Main Journal	9	Kyunghyang Newspaper, Dong-A Ilbo, Munhwa Ilbo, Seoul Newspaper, World Daily, JoongAng Ilbo, Chosun Ilbo, Hankyoreh, Hankyoreh, Hankook Ilbo
Local Journal	9	Jungbu Daily (Gyeonggi), Gangwon Provincial Daily (Gangwon), Jungbu Maeil (Chungbuk), Chungcheong Today (Chungnam), Maeil Newspaper (Gyeongbuk), Busan Ilbo (Gyeongnam), Jeonbuk Provincial Daily (Jeonbuk), Jeonnam Daily (Jeonnam), and Jemin Daily (Jeju)
Economic Journal	2	Daily Economy, Korean Economy
Broadcasting company	4	KBS, MBC, SBS, YTN

Source: Restructured from the BIG Kinds website (www.bigkinds.or.kr)

In order to utilize news big data, which is currently classified as unstructured text, data processing is required for Natural Language Processing (NLP) on a PC. In this study, news big data was first collected for BIG Kinds for data processing, and then morphological analysis and data preprocessing were performed. Morpheme analysis is the extraction of morpheme, the smallest unit of meaning. To analyze texts, it can be performed by removing unnecessary phrases through data preprocessing to normalize various expressions that have the same meaning.

We set the keyword "university internationalization," and collected data using BIG Kinds, out of 11,374 news articles initially collected, 10,160 articles such as simple announcements, individual identification, overlapping reports, and articles that did not fit the topic were excluded. Finally, 1,214 news articles were analyzed. The collected news data were extracted into an Excel file that completed morpheme extraction and keyword purification of unstructured text through BigKinds, and the data were refined again based on the meaning unit noun phrases through the preprocessing process.

Analysis method

In this study, the Netminer 4.4.3 topic modeling method, which is generally used for morpheme extraction and analysis of Hangeul, was used. In the keyword analysis, which was implemented to support the topic modeling, frequent words are likely to be the keywords. Frequency of the words (term frequency [TF]) in large document data and TF-IDF values weighted to extract keywords in the document are required. This can be interpreted by researchers as an important word in the document since a specific word appears frequently in multiple documents, so the higher the value multiplied by the frequency TF of the frequently appearing word and the inverse document frequency (IDF) of the number of documents appeared in the document (Yoon et al., 2021).

In topic modeling, it is very important to determine the number of significant topics. However, in determining the number of topics, researchers compare the results with the relevance, suitability, and interpretability of the topic (Jung & Kim, 2021; Han, Kim, 2019) and then analyze the topic and its complexity accurately. In this study, after reviewing the context of news data analyzed based on

previous studies and the degree of overlap of keywords by each topic, out of 2 to 20 topics, 7 topics were found out to be the least overlapping and easiest to interpret. In addition, to consider the limitations and semantic suitability of interpretation in the results of a large amount of news data analysis, α and β values were set while using the topic modeling analysis technique. The α value that adjusts the topic distribution by document by referring to previous studies using the LDA analysis method was set to 0.1, and the β value that adjusts the probability of word appearance for each topic was set to 0.01 (Lee & Lee, 2021; Yoon et al, 2022). Thereafter, the topic was extracted by 1000-sampling repetitions.

Research results

Phase 1: The Changing University Environment Created by the Wind of Internationalization of Universities

The results of topic modeling analysis of 364 news articles related to internationalization of universities collected from May 31, 1995 to October 31, 2004.

[Topic 1] derived keywords such as "studying abroad", "student", "foreign", "president of a university ", and "overseas", and defined the topic name as "studying abroad, student flow". [Topic 2] defined the name of the topic as "International competition brought by internationalization of universities" with keywords such as "international", "education", "region", "wind", and "competition". According to the derivation of keywords such as “foreigner”, “professor”, “support”, “Korea University”, and “recruitment” in [Topic 3], the topic name was set as “increasing the number of foreign teachers and the importance of foreign language support”. Keywords such as “education”, “world”, “international”, “openness”, and “competitiveness” were derived from [topic 4], and they were comprehensively measured and the topic name was designated as “university is competitive in the era of internationalization”. Keywords such as “exchange”, “training”, “student”, “cooperation”, and “foreign” were seen in [Topic 5], and accordingly, the topic name was defined as “exchange and cooperation between domestic and foreign universities”. Keywords such as “international”, “foreign”, “education”, “promotion”, and “graduate school” were derived from [Topic 6] and defined as “acceleration of internationalization education”. In [Topic 7], the keywords “international”, “cultivation”, “local”, “world”, and “specialized” were derived, and based on this, the topic name was defined as “competition and specialization to take lead in internationalization of universities”.

Phase 2: The Limits and Growth of Internationalization in Universities

The results of topic modeling analysis of 441 news articles related to internationalization of universities collected from November 1, 2004 to December 31, 2011.

[Topic 1] defined the topic name as "global campus competition" with keywords such as "campus", "global", "attention", "world", and "Korea". [Topic 2] derived keywords such as "studying abroad", “global", "level", "Busan", and "China", defining the topic name as "the hidden side of globalization, the limit-of internationalization." As keywords such as “talent”, “education”, “forum”, “future”, and “cultivation” were derived from [Topic 3], the topic name was set as “the subject of university education, the expansion of qualitative growth”. Keywords such as “competitiveness”, “English”, “education”, “lecture”, and “professor” were derived from [Topic 4], and they were comprehensively assessed and the topic name was set to be “internationalization through English lectures”. In [Topic 5], keywords such as “studying abroad”, “Korea”, “foreign”, “attracting students”, and “region” were seen, and accordingly, the topic name was defined as “management and attracting foreign students”. Keywords such as “foreigners”, “English”, “student”, “lecture”, and “professor” were derived from [Topic 6], and the topic name was defined as “institutional and administrative support for internationalization”. [Topic

7] The keywords “overseas”, “degrees”, “support”, “global”, and “specialized” were derived, and based on this, the topic name was defined as “the era of foreign talent training and internationalization”.

Phase 3: A new version of internationalization of universities (expansion of international students and gains and losses of university evaluation)

The results of topic modeling analysis of 410 news articles related to internationalization of universities collected from January 1, 2012 to December 31, 2019.

Keywords such as "talent," "employment," "overseas," "characteristics," and "operation" were derived from [Topic 1], defining the topic name as "increased dependence on foreign students and the reality." [Topic 2] has keywords such as "international", "program", "competitive", "selection", and "environment", and we defined the topic name as "new dynamics and fruits of university internationalization". [Topic 3] set the topic name as "internationalization only on the outside, growing internationalization" as the keywords such as "student", "foreign", "Korean", and "opportunity" were derived. Keywords such as “global”, “studying abroad”, “expansion”, “policy”, and “Korea” were derived in [Topic 4] and by comprehensively assessing them, the topic name “policies to attract international students, a breakthrough of local universities,” was given. Keywords such as “international”, “evaluation”, “research”, “Asia”, and “theses” were seen in [Topic 5] and accordingly, the name of the topic was defined as “evaluation, an internationalization task of universities”. Keywords such as "world," "international," "lecture," "competence," and "student" were derived in [Topic 6] and the topic was defined as "efforts to strengthen internationalization capabilities." In [Topic 7], keywords such as “studying abroad”, “attraction”, “Korea”, “management”, and “tuition” were derived, and based on this, the topic was defined as “gains and losses of attracting international students”.

The results of topic modeling analysis were summarized in the Table 2.

Table 2: Topic and keyword

Name	Topic	Keyword
Phase 1: The Changing University Environment Created by the Wind of Internationalization of Universities	1) studying abroad, student flow	"studying abroad", "student", "foreign", "president of a university ", and "overseas"
	2) International competition brought by internationalization of universities	"international", "education", "region", "wind", and "competition"
	3) increasing the number of foreign teachers and the importance of foreign language support	“foreigner”, “professor”, “support”, “Korea University”, and “recruitment”
	4) university is competitive in the era of internationalization	“education”, “world”, “international”, “openness”, and “competitiveness”
	5) exchange and cooperation between domestic and foreign universities	as “exchange”, “training”, “student”, “cooperation”, and “foreign”
	6) acceleration of internationalization education	“international”, “foreign”, “education”, “promotion”, and “graduate school”
	7) competition and specialization to take lead in internationalization of universities	“international”, “cultivation”, “local”, “world”, and “specialized”

Name	Topic	Keyword
Phase 2: The Limits and Growth of Internationalization in Universities	1) global campus competition	"campus", "global", "attention", "world", and "Korea"
	2) the hidden side of globalization, the limit-of internationalization	"studying abroad", "global", "level", "Busan", and "China"
	3) the subject of university education, the expansion of qualitative growth	"talent", "education", "forum", "future", and "cultivation"
	4) internationalization through English lectures	"competitiveness", "English", "education", "lecture", and "professor"
	5) management and attracting foreign students"	"studying abroad", "Korea", "foreign", "attracting students", and "region"
	6) institutional and administrative support for internationalization	"foreigners", "English", "student", "lecture", and "professor"
	7) the era of foreign talent training and internationalization	"overseas", "degrees", "support", "global", and "specialized"
Phase 3: A new version of internationalization of universities	1) increased dependence on foreign students and the reality	"Talent," "employment," "overseas," "characteristics," and "operation"
	2) new dynamics and fruits of university internationalization	"international", "program", "competitive", "selection", and "environment"
	3) internationalization only on the outside, growing internationalization	"student", "foreign", "Korean", and "opportunity"
	4) policies to attract international students, a breakthrough of local universities	"global", "studying abroad", "expansion", "policy", and "Korea"
	5) evaluation, an internationalization task of universities	"international", "evaluation", "research", "Asia", and "theses"
	6) efforts to strengthen internationalization capabilities	"world," "international," "lecture," "competence," and "student"
	7) gains and losses of attracting international students	"studying abroad", "attraction", "Korea", "management", and "tuition"

Conclusions and Implications

Summary and Conclusion

This study was conducted to derive major discourses and implications for university internationalization by recognizing keywords and topics of university internationalization by period using news big data related to university internationalization. To this end, 1,214 news reported from May 31, 1995 to December 31, 2019 were divided into three periods and analyzed using Topic Modeling (LDA) techniques, and the following discourses were analyzed for each period.

In the first period, topics such as competition to install global campuses, globalization, limitations of internationalization, expansion of qualitative growth of university education, an increase in wave of international students, despite all those efforts internationalization is subdued, institutional and

administrative support for internationalization, and the era of internationalization were drawn. Based on this, the theme of the first comprehensive discourse was defined as a changed university environment caused by university internationalization. In the second period, topics such as competition for building global campuses, the hidden side of globalization, limitations of internationalization, expanding qualitative growth of university education, internationalization through English lectures, institutional and administrative support for internationalization, and the era of internationalization were derived. Based on this, the subject of the second comprehensive discourse was defined as the limitations and growth of university internationalization. In the third period, topics such as increasing dependence on foreign students and the reality, a new landscape, and fruits of internationalization of universities, growing internationalization, breakthroughs of regional universities, evaluation—an internationalization task of universities, and gains and losses of internationalization. Based on this, the subject of the third comprehensive discourse was defined as new dynamics of university internationalization (an increase of international students and gains and losses of university evaluation).

Specifically, when looking at the topics, it is necessary to re-evaluate from an educational and sociological perspective whether university internationalization was used as a means to advance higher education and enhance national competitiveness through internationalization. The Korean government tried to make universities foster global talents through educational reform in 1995 to increase their competitiveness and promote graduate schools to produce excellent academic papers and researchers. To that end, universities have increasingly built global campuses, constantly emphasized English education and encouraged rapid growth of university districts. Although it was intended to take the lead in the era of globalization, the situation of Korean universities in the actual university evaluation looks deem and the rapidly changing global university market trend is difficult to keep up with. University internationalization was used to foster civilized excellent global talent required by the neoliberal system and was considered a funding tool for universities. The crisis of universities due to the population cliff and a sharp decline in the school-age population was rather recognized as a positive means for university development and unilaterally promoted rather than considering negative aspects such as lack of student rights, professors' advice, lecture quality, and administrative support.

Therefore, the university internationalization and international student policy developed during those time periods has caused social problems due to quantitative expansion-oriented policies to attract international students such as conflicts between Korean and international students, difficulty in communication, and illegal employment due to housing problems.

Taken together, the importance of internationalization of universities is clear. Apart from government intervention and investment, universities should have their own consciousness and mission to understand the exact concept of internationalization.

Therefore, efforts should be made to revitalize internationalized universities through research, papers, and news articles so that beneficiaries, related workers, and citizens can share the importance of communication between the government, universities, and institutions for university internationalization.

Implications

It is evaluated that the discourse on internationalization of universities is not only recognized at the university level but is also taking the initiative at the national level, and the direction of university education has been lost due to its passive nature and quantitative evaluation.

Subsequently, pointing out the fact that the strategy to strengthen internationalization capabilities depends on international students, the main focus was on establishing a new educational paradigm and creating a new ground for university internationalization. There were many articles insisting that the

direction of internationalization should be considered and the connection and cooperation of the metropolitan and local universities to foster global talent is necessary.

Lastly, while criticizing quantitative evaluations of internationalization indicators, there were self-reflecting positions on regarding individuals as a means while advocating "neoliberalism" in the university internationalization process in the Korean society. The government and universities intend to stop expanding and supplementing short-term evaluation-oriented indicators, and suggest that it is important to reconsider the reality of universities in the long term and seek alternatives for actors.

This study has the following significance. First, while analyzing the discourse on internationalization of universities for each period, the social perspective of the expansion of the phenomenon was analyzed. Second, while previous studies analyzed university internationalization as a policy factor or a topic, this study focuses on the media to look at the spread of university internationalization in domestic society and how it is formed into discourse in educational policy decision-making. Third, by comprehensively analyzing the news articles related to university internationalization reported over the past 25 years, the scope of research on the internationalization of higher education centered on specific regions, institutions, communities, and individuals has been expanded. Fourth, through news big data, data was empirically and systematically analyzed using an analysis technique called topic modeling to promote diversity in research methods from existing literature research, surveys, and case studies. Finally, looking at the discourse on the internationalization of universities in the news articles, can be used as a reference in the direction of policy establishment or promotion related to the internationalization of universities in the future.

Efforts should continue to be made to find the direction of university education to respond to the rapidly changing environment and the future by looking at the already constructed discourses based on social consensus on how to define and think about university internationalization. Suggestions for follow-up research are as follows. This study derived research results through text analysis techniques with news data, but research can be conducted based on data from various dimensions. In addition, if the analysis period is further expanded and the current university internationalization-related data is collected and discourse is analyzed, more abundant implications can be derived. Finally, in this study, the number of topics was set based on the researcher's interpretability, but in future studies, it is expected that more systematic and in-depth results will be derived by applying empirical methods such as a complexity index.

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Theme III: Re-Assuring Education Quality and Institutional Research

The Extent Implementation of the Community Outreach Programs and Activities

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ABSTRACT

The community outreach programs and activities is an agents of change, developing a social conscience through community awareness and involvement. This study aimed to assess the extent of implementation of the community outreach programs and activities of St. Therese-MTC Colleges among Adopted Barangays. Using the quantitative descriptive-survey method, the study utilized 303 participants composed of randomly selected households of the adopted barangays utilizing stratified random sampling. Researcher-made questionnaires were utilized to collect the needed data for the implementation of the community outreach programs and activities. In data analyses, mean, standard deviation, frequency count, percentage distribution, t-test, and one-way ANOVA were employed. The findings revealed that the implementation of the community outreach programs and activities is slightly implemented. This means that those programs and activities do not answer the needs of the barangay and there are no comprehensive and consistent programs and activities conducted by the said office. Meanwhile, the findings reveal that there is no significant difference in the extent of implementation of the outreach programs and activities when the respondents are taken as a whole and group according to the area, age, sex, employment status, civil status, and educational attainment. The findings of the study provided baseline information in the formulation of the development of the outreach and extension manual of programs and activities.

Keywords: Implementation, Outreach, Programs, Activities, Manual

Introduction

The community outreach program enables the people in the community to think that there are opportunities for change and development through cooperative work and collective action. Through this, the people in the community learn to secure short and long-term improvements in their standard of living as soon as they receive access to their basic needs. This empowers them by educating them to be aware of their obligation as well (Padilla, 2006).

The basic understanding of community organizing has evolved through the years, bringing forth a broad range of ideas depicting an evolution that reflects the western and Filipino principles of its practitioners. In the Philippine setting, community organizing is seen as a systematic, planned, and liberating change process of transforming a community into an organized conscious, empowered, self-reliant, just, and humane entity and institution. The process is systematic and planned because the change agent follows specific and logical steps in organizing the community. When the community is complacent about the problem that affects it. The people themselves become aware that there are indeed problems that exist in their midst, and they begin to feel the need to resolve these fully utilizing their resources and skills (Padilla, 2006).

In the past years, the St. Therese-MTC College conducts community outreach programs and activities such as Green Wave Project and War-on Waste Project, Competency-Based Sustainability, Info-Brimmed Activities, and other related activities like Feeding, Gift Giving, Blood Donation, and Medical Mission Activities. As observed these several programs conducted by the college are not properly studied specifically on how consistent the program on helping the above target recipients of the adopted Barangay (PACUCOA findings, Item #7).

Thus, the Outreach and Extension of St. Therese-MTC Colleges is an agent of change, developing a social conscience through community awareness and involvement. Further, the school has been actively involved in community outreach since 2001, the adopted barangay was Brgy. 8, Tigbauan, Iloilo, Brgy. 9, Tigbauan, Iloilo, and Brgy. Baguingin, Tigbauan, Iloilo, where programs like Livelihood, Feeding, Tree Planting, Mangrove Planting, Coastal Clean Up, Clean Up Drive, and more activities have been administered by the Outreach and Extension Office. As time goes by the institution has worked a lot to provide for the needs of the people in the adopted barangay. Additionally, It is always the aim of the college through the Outreach and Extension Office to increase awareness of the students, faculty, and staff on the needs, problems, and resources of the community, to introduce projects in line with the competency of the college in the adopt barangay that address the needs of the local community, to increase environmental awareness activities that seek to preserve the natural resource and to strengthen the partnership of the college with NGO's and government agencies in their community initiatives (Outreach Office Handbook, 2019).

Upon the investigation of the evaluation of Programs and Activities conducted by the Outreach and Extension Office for the past three years (2017-2019), the researchers were able to find out that there were no consistent and comprehensive Community Outreach Programs and Activities that have been conducted to the Adopted Barangay. Therefore, the researchers would like to find out the comprehensiveness, effectiveness, and consistency of the outreach programs and activities mentioned above, for further development and creation of community outreach programs and activities manual.

Theoretical Framework

This study is anchored in the Classical Model by Rothman (2001) which state that community development (or locality development) is considered a process designed to create conditions of economic and social progress for the whole community with the fullest participation of the people. It seeks redistribution of power, resources, or decision-making powers in the community,

changing basic policies of formal organizations (social action). Community development is also concerned with establishing, arranging, and delivering goods and services to people who need them (social planning).

Further, this framework focuses on the broader participation of the community. It aims at the collective participation of the community in the entire decision process, i.e. from goal determination to its achievement. Further, resonates with the common understanding of community development and it includes, self-help development, democratic procedures, indigenous leadership, and voluntary cooperation. A few examples of this kind of community organization would be village-level work in community development programs, community work for adult education, neighborhood work program by settlement houses, and alike.

In the context of this study, the researchers wanted to find out among the residents of adopted barangays if the Outreach Programs and Activities of St. Therese-MT Colleges through the Outreach and Extension Office are effectively implemented. Furthermore, based on the Classical Model of Rothman the researchers attempt to design or develop a manual that could uplift the economic and social progress of the community likewise to ensure its effective implementation. The factors that the researchers considered were age, sex, civil status, employment status, and educational attainment.

Methods

This study employed the quantitative research design, particularly the descriptive-survey approach. The descriptive approach particularly described the extent of implementation of the community outreach programs and activities of St. Therese-MTC Colleges among Adopted Barangays. The study utilized 303 participants composed of randomly selected households of the adopted barangays utilizing stratified random sampling. One hundred sixty-six (166) from Barangay Baguingin, seventy-eight (78) from Barangay 8, and fifty-nine (59) from barangay 9. The study utilized the researcher-made survey questionnaires to collect the needed data for the implementation of community outreach programs and activities. Meanwhile, the questionnaires were subjected to reliability and validity tests. The descriptive analysis determined In data analyses, mean, standard deviation, frequency count, rank, percentage distribution, and t-test, to determine the extent of implementation of the Community Outreach Programs and Activities of St. Therese-MTC Colleges among Adopted Barangays and T-test and one-way ANOVA were employed to determine the difference between the demographics and the extent implementation of the Community Outreach Programs and Activities.

Results and Discussion

The extent of Implementation of the Community Outreach Programs and Activities of St. Therese-MTC Colleges among Adopted Barangays

Table 1 presents the extent of implementation of the Community Outreach Programs and Activities of St. Therese-MTC Colleges among Adopted Barangays when classified according to the entire group, the results show that the Barangay. Baguingin respondents have a mean of 2.40 with the description of Slightly implemented. This means that the implementation of the institution's community outreach programs and services does not address an important need, identify and target the goal of college. Further, this simply implies that as a whole the extent of it was not well implemented. Additionally, this means that the contribution and connection to the adopted barangay are less, and so they become even more disengaged. This study contradicts the study

conducted by Aswigue (2009) stating that the activities of the outreach program were implemented effectively, especially on Education, Recreation, and Youth Empowerment. However, according to Bhayat (2012), outreach activities develop learning and applying knowledge to studies, community services, a sense of responsibility toward the unreached communities, advancing both oral health-care professionals and the community; reflection and feedback on the experience to improve and sustain the process; and a partnership between communities.

For the sex, the result showed that the Male has the same mean of 2.40 with the description *Slightly Implemented.* While, as to employment Status, the result showed that the Employed residents have a mean of 2.25 with the description of *Slightly Implemented* and the Unemployed residents have a mean of 2.45 with the description of *Slightly Implemented.* Further, for the civil status, the result showed that the Single has a mean of 2.37 with the description of *Slightly Implemented*, the Married has a mean of 2.39 with the description *Slightly Implemented*, and this description is the same with Widowed with the mean of 2.58.

Lastly, for Educational Attainment, the result showed that the Elementary level has a mean of 2.70 with the description of *Moderately Implemented*, for the Elementary Graduate has a mean of 2.30 with the description of *Slightly Implemented,* for the High school graduate has a mean of 2.55 with the description of *Slightly Implemented*, for the High school graduate has a mean of 2.55 with the description of *Slightly Implemented*, for the College level has a mean of2.36 with the description of *Slightly Implemented*, and this description is the same with College graduates with a mean of 2.12.In general, when the respondents were taken as a whole the result showed that the community outreach programs of St. Therese MTC Colleges are *Slightly Implemented.*

Table 1: Extent Implementation of the Community Outreach Programs and Activities of St. Therese-MTC Colleges among adopted barangays as a whole and when grouped according to the area, sex, employment status, civil status, educational status

Selected Variables		N	Mean	Description
Entire Group		303	2.40	Slightly Implemented
A. Area	Baguingin	166	2.40	Slightly Implemented
	Brgy. 8	78	2.48	Slightly Implemented
	Brgy. 9	59	2.30	Slightly Implemented
B. Employment Status	Employed	66	2.25	Slightly Implemented
	Unemployed	237	2.45	Slightly Implemented
C. Civil status	Single	112	2.37	Slightly Implemented
	Married	157	2.39	Slightly Implemented
	Widowed	34	2.58	Slightly Implemented
D. Educational Attainment	Elementary Level	11	2.70	Moderately Implemented
	Elementary Graduate	14	2.30	Slightly Implemented
	High School Level	52	2.55	Slightly Implemented
	High School Graduate	83	2.55	Slightly Implemented
	College Level	76	2.36	Slightly Implemented
	College Graduate	67	2.12	Slightly Implemented

Note: 1.00-1.80 Not Implemented; 1.81-2.60 Slightly Implemented; 2.61-3.40 Moderately Implemented; 3.41-4.20 Implemented; 4.21-5.00 Highly Implemented

The Significant Difference in the Extent Implementation of the Community Outreach Programs and Activities of St. Therese-MTC Colleges among Adopted Barangays when grouped by Sex and employment status

Table 2 shows the t-test result on the significant difference in the extent of implementation of the Community Outreach Programs and activities of St. Therese-MTC Colleges among Adopted Barangays when grouped by Sex and employment status. It showed that when the respondents are classified according to their Sex, there is no significant difference, for the Sex .995>.05. This implies that the extent of implementation of the community outreach programs and activities does not differ from those male and female. This study contradicts the results conducted by Pallavi and Rajkumar (2011) the results of similar research showed that the outcomes of the outreach activities for females are influenced by their professional careers which results in the conflict of trying to balance their work.

Further, when the respondents are classified according to their Employment Status, there is no significant difference, for the Employment Status, .162>.05.This suggests that the extent of implementation of the community outreach programs and activities does not differ for those who are employed or unemployed. This suggests that the adopted barangay has common views of the magnitude of what is being introduced about the community outreach projects and extension facilities.

Table 2. The Significant Difference in the Extent Implementation of the Community Outreach Programs and Activities of St. Therese-MTC Colleges among Adopted Barangays when grouped by Sex and employment status

Category		N	Mean	t	df	sig	Interpretation	Decision
Sex	Male	128	2.40	.006	300	.995	NS	Do not reject null hypothesis
	Female	175	2.40					
Employment Status								
	Employed	66	2.25	-1.401	301	.162	NS	Do not reject null hypothesis
	Unemployed	237	2.45					

p-value (sig.) > .05 Not Significant (NS) @ .05 alpha.

Significant Difference in the extent of implementation of the Community Outreach Programs and activities of St. Therese-MTC Colleges among Adopted Barangays when grouped by area, civil status, educational attainment

Table 3 presents the One-Way Analysis of Variance Test Results that there is no significant difference in the extent of implementation of the Community Outreach Programs and activities of St. Therese-MTC Colleges among the area of adopted barangay, civil status, and educational attainment.

Table 3: Significant Difference in the extent of implementation of the Community Outreach Programs and activities of St. Therese-MTC Colleges among Adopted Barangays when grouped by area, civil status, and educational attainment.

Category		N	Mean	F	Sig.	Interpretation	Decision
Area of Adopted Barangay	Baguingin	166	2.40	.517	.597	NS	Do not reject null hypothesis
	Brgy. 8	78	2.48				
	Brgy. 9	59	2.30				
Civil Status	Single	112	2.37	.599	.550	NS	Do not reject null hypothesis
	Married	157	2.39				
	Widowed	34	2.58				
Educational Attainment	Elementary Level	11	2.70	1.897	.095	NS	Do not reject the null hypothesis-sis
	Elementary Graduate	14	2.30				
	High School Level	52	2.55				
	High School Graduate	83	2.55				
	College Level	76	2.36				
	College Graduate	67	2.12				

p-value (sig.) > .05 Not Significant (NS) @ .05 alpha

Conclusion

The slight implementation of the Community Outreach Program/Activities of the college indicates that the institution is not fully conducting its Program/Activities to the adopted Barangay. The researchers perceived it as Slightly Implemented or near to not Implemented, and there is no significant difference when the respondents are taken as a whole and group according to Age, Sex, Employment Status, Civil Status, and Educational Attainment which means it does not answer the needs of the barangay and there are no comprehensive and consistent programs and activities conducted by the said office. It is therefore very important that the college through the Community Outreach Program Office develop a manual to ensure the effectiveness of the conduct of Community Outreach programs/Activities to be conducted by the College. Therefore, this study must be presented to the administration, especially to the Community Outreach and Extension Office Coordinator, and to the other Universities/Colleges as their basis for effective implementation. Furthermore, the other stakeholders like the Student Executive Council for them to have a guide on how to make their implementation of outreach programs/activities effective.

The Outreach Coordinators of St. Therese MTC-Colleges with their knowledge of the findings of this study must create and follow the manual to ensure the effectiveness of the conduct of outreach programs/activities of the college. They must also orient properly the faculty, staff, and students to the content of the manual because this is the only way to ensure the effectiveness of its

implementation. Specifically, he/she must strictly follow the results of the needs assessment as the basis to design appropriate, accurate, consistent, and comprehensive outreach programs/activities. Furthermore, the manual will be the basis for achieving the goal of the College and for the continuous service to the adopted barangay and will guide to check the effectiveness of the programs and activities being offered to them. Additionally, the Local Government Unit specifically for the Barangay Officials must be cooperative and participative in the effective implementation of Outreach Programs and Activities.

Further, research may be conducted by other colleges and universities to make a comparison Additionally, this may be done to investigate the effect of Outreach programs/activities among the participants of a particular outreach program. And for future researchers to let them know how to effectively conduct outreach programs/activities. Finally, the researchers must develop a manual, specifically designed according to the needs of the Barangay to ensure the effective implementation of outreachprograms/activities of the institution.

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Tertiary Education Readiness Assessment of the Pioneering Senior High School Graduates of the Philippine K-12 Program

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ABSTRACT

Secondary school graduates entering tertiary education must possess the skills and knowledge to adapt rapidly to the ever-changing landscape of a knowledge-based economy. This study assessed the cognitive and non-cognitive college readiness levels of the 127 pioneering senior high school graduates of the Philippine K-12 Program enrolled as first-year college students in a private Higher Education Institution (HEI) in Northern Mindanao, Philippines. Data gathered for this explanatory mixed-method research were collected using two standardized tests (OLSAT and 16PF). A focus group discussion deepened respondents' responses and strengthened the analysis and interpretation of data. Results revealed that many students had a below-average cognitive level and average non-cognitive skills implying that they were not ready for the tertiary level cognitively but were college-prepared non-cognitively. It was concluded that assessing students' college readiness levels proved imperative to ensure that standards of the chosen programs are met vis-à-vis students' skills. The researchers recommend that Higher Education Institutions strengthen and institutionalize readiness assessment that will serve as a basis for bridging and remediation program for identified cognitively unprepared college students.

Keywords: College Readiness, K-12 Program, Senior High School, Cognitive Skills, Non-cognitive Skills

Introduction

The Philippines implemented the K to 12 Program after enacting Republic Act (RA) No. 10533, also known as the Enhanced Basic Education Act 2013, in its never-ending pursuit of true academic excellence. The implementation of the K-12 Education Plan, covering Kindergarten and 12 years of basic education (six years of primary education, four years of Junior High School, and two years of Senior High School [SHS]), aims to form students who are not only prepared for further study and work (Official Gazette, n.d.), but who are interactive learners and possess the necessary knowledge, skills, and attitude which are essential in college life.

Since the graduation of the first batch of Senior High School students in 2018, questions about their readiness to proceed to college surfaced. Past local research used a qualitative approach such as the study of Nishimura (2014) which revealed that there is a relationship among individual perceptions of college and career readiness skills, individual school elements, and school practices like creating a culture of critical thinking that leads a 12th grade student towards tertiary preparation. According to Mohammad (2016), many students had a negative opinion of the two extra years of high school, citing the lack of facilities, teachers, and non-teaching staff as well as the additional burden it placed on parents and students by lengthening the time that students had to spend in school.

There are many disagreements and controversies on what preparedness means and how to assess it, even if it is widely recognized that today's high school graduates should be college and career-ready (Zwick, 2018). The Department of Education categorically states that the K to 12 program's success can be measured by various factors, including its ability to ensure that SHS graduates become college-ready, become entrepreneurs, and find work (DepEd, 2018). According to the ACT (2005), college readiness is "...the level of preparation a student needs to be ready to enroll and succeed – without remediation – in a credit-bearing course at a two-year or four-year institution, trade school, or technical school." In the 21st century, college preparation is necessary for all high school students to be prepared for life in today's "Knowledge Economy" (Baker et al., 2005).

Educators and governments aim to ensure that all high school graduates are prepared for postsecondary education and employment (Dougherty, 2014). To put it another way, high school graduates must be ready to adapt to the ever-changing terrain of a knowledge-based economy quickly. These college preparation takeaways have prompted stakeholders in the K to 12 Program to consider how to appropriately prepare students for the transition from high school to higher education, with the ultimate objective of success in their chosen careers. As a result, international research on college preparation highlights the importance of students being prepared for college (Conley, 2010).

The US Department of Labor established industrial competency models that include cognitive and non-cognitive core skills applicable across all economic sectors (ACT, 2014). Camara (2008) looked into the aspects that could lead to college readiness. "Single indicators, such as a test score, provide a restricted answer...academic metrics are vital to college achievement, but also non-academic measures will be required to address outcomes" (Karnick, 2013) effectively.

Based on the above, the researchers believe that it is imperative to address difficulties of senior high school graduates entering higher education by evaluating their readiness to confirm the K to 12 Program's efficacy and achievement of its aim of producing high school graduates who are college ready. The researchers thought that assessing students' cognitive and non-cognitive skills would produce a more full, thorough, and strong picture of students' preparation for college. The researchers hoped that evaluating students' cognitive and non-cognitive abilities would provide a more robust, comprehensive, and complete picture of students' college readiness. According to ACT (2014), cognitive skills entail conscious intellectual processes like thinking, reasoning, or remembering, whereas non-cognitive or "soft skills" are linked to a person's personality, temperament, and attitudes.

The value of this study was to match the levels of readiness with the cognitive and non-cognitive standards for first-year college students enrolled in a private institution in Northern Mindanao, Philippines. These students were the first graduates of the K-12 Curriculum to complete the two-year Senior High School program.

Framework

Experiential Learning Theory (2011) is a dynamic and comprehensive theory that describes learning as the core process of human adaptation involving the entire person. The dynamic learning viewpoint is based on a learning cycle with two goals: action/reflection and experience/abstraction, and it is holistic in nature, meaning it functions at all levels of human civilization, from individuals to groups, organizations, and society. As a result, Experiential Learning Theory can be applied in the classroom and in many aspects of life (Kolb & Kolb, 2017). Accordingly, the researchers utilized the ELT theory as the study's core framework since it supports the idea of learning that includes important abilities, such as cognitive and non-cognitive skills, and the importance of the environment in the learning process.

According to Kolb and Kolb (2011), learning is a holistic adaptation process; all learning is re-learning; learning arises from synergetic transactions between the person and the environment. Learning does not only take place inside the classroom but can occur outside of the classroom, in places like the home, school, and business.

Conley (2010) defines college readiness as the level of preparation a student needs to succeed without remediation in credit-bearing coursework at the postsecondary level. Conley (2007, 2010) proposes a college readiness model by stressing the importance of students' cognitive capabilities and behavioral attributes. His college readiness model consists of four interactional components that students must possess to complete credit-bearing coursework: vital cognitive strategies, key content, academic behaviors, and contextual skills and awareness.

Key Cognitive Strategies are the ways of thinking necessary for college-level work. *Key Content Knowledge* refers to key foundational content and "big ideas" from core subjects that all students must know well, and an understanding of the structure of knowledge in core subject areas, which enables students to gain insight into and retain what they are learning. *Key Learning Skills and Techniques* consist of two broad categories: student ownership of learning, which includes goal setting, persistence, self-awareness, and motivation. *Key Transition Knowledge and Skills* are necessary to navigate the transition to life beyond high school successfully.

The model of Conley is a guide in this study since the researchers also agreed that to assess the students' college readiness level, the totality of a person must be considered, which includes not only the cognitive skills but also the non-cognitive skills.

Method

The researchers used the explanatory mixed-method research design to probe the college-readiness level of the 127 first-year college students who underwent the senior high program in the cognitive (school ability) and the non-cognitive (openness to experience, conscientiousness, extraversion, agreeableness, and emotional stability) skills.

To obtain the desired data, a survey questionnaire was conducted. Two standardized tests were utilized: the Otis-Lennon School Ability Test (OLSAT 7) for the cognitive skill and the Sixteen Personality Factor (16PF) Questionnaire for the non-cognitive skills. OLSAT 7 is a standardized test authored by Arthur S. Otis and Roger T. Lennon. OLSAT 7 assesses students' thinking skills and provides an understanding of a student's relative strengths and weaknesses in various reasoning tasks. On the other

hand, the 16PF by Dr. Raymond Cattell is represented to identify the primary components of personality. The assessment provides scores on 16 primary factors or scales and five global factors or scales. For this study, only the five global factors were used: Extraversion, Anxiety, Tough - Mindedness, Independence, and Self-Control. These five global factors corresponded closely to the *Big Five Model* of personality.

The researchers used the Stanine on the total score for easy-to-understand interpretation in the cognitive skill, while Sten was used in the scoring for the non-cognitive skills.

Cognitive College Readiness Standard

The researchers followed the private school's standard cognitive level, where the respondents take their tertiary education. It is apparent that the standard cognitive college readiness for board courses such as Bachelor of Science in Accountancy (BSA), Bachelor of Science in Secondary Education (BSED), Bachelor of Science in Elementary Education (BEED), Bachelor of Science in Social Work (BSSW), Bachelor of Science in Criminology (BSCRIM), and Bachelor of Science in Nursing (BSN) should be *Stanine 4 and above* (Average to Above Average). For non-board courses like Bachelor of Science in Hotel and Restaurant Management (BSHM), Bachelor of Science in Information Technology (BSIT), and Bachelor of Science in Business Administration (BSBA) students should have at least *Stanine 2* (Below Average) on their OLSAT Test results. It implies that students should be fully equipped with the knowledge and skills when they enroll in college, especially in board courses. Hence, these scores will be utilized to assess the student's cognitive performance.

Non-Cognitive College Readiness

The required personality traits (global factors) for each course offered in private school were based on Holland's Theme, RIASEC. A study by Logue (2005) showed that personality traits and vocational interest themes were better predictors of college satisfaction. That is why John Holland's *Theory of Vocational Personalities and Work Environments* is used to identify the non-cognitive college readiness standards.

Students should have an average level (STEN 5) on their required global factors. Based on the 16PF Administrator's Manual 5th Edition, Criminology students can be associated with the Realistic theme and should acquire global factors such as tough-mindedness and independence. An Investigative theme can be best described for BSIT students and requires tough-mindedness, extraversion, and independence. Courses such as BSSW, BSN, BSED, and BEED can be linked as social persons wherein they must be extraverted, independent, anxious, and self-controlled. On the other hand, Enterprising can be associated with BSBA and BSHM students with required personality traits, the same as BSIT students who should be tough-minded, extraverted, and independent. Conventional people resemble the BSA students who should possess tough-mindedness and self-control.

The data analysis included various statistical techniques such as frequency count, simple percentages, mean and standard deviation.

Results

College Readiness Level of the Respondents

Cognitive. Table 1 shows the frequency, percentage, and mean distribution of the respondents' college readiness level regarding cognitive skills. It discloses that 66 percent of the respondents (n=84) had below-average school *ability*. These students were described as having difficulty using language to express themselves, comprehend stories, or in reasoning and problem solving that employs verbal skills. On the other hand, the remaining 33.8 percent of the respondents (n=43) obtained an *Average School*

Ability on their OLSAT Test results. It was revealed that many students might lack abilities essential to success in school performance, such as critical thinking, reasoning abilities, and problem-solving skills.

The importance of the cognitive aspect in college readiness was intensified as other policy scholars have defined college readiness primarily as academic skills and achievement to prepare students to be successful for college-level coursework (Conley, 2007; Nishimura, 2014). In addition, Antonak (1988) concluded, as cited by Pearson (2005), that while the best predictor of current achievement was a past achievement, OLSAT scores were a powerful predictor of achievement.

Table 1: Respondents' College Readiness Level in terms of Cognitive Skills

Stanine	Verbal Interpretation	f	%	Mean
9	Above Average School Ability	0	0	**0**
8		0	0	
7		0	0	
Total (for Above Average)		***0***	***0***	
6	Average School Ability	4	3.1	**4.51**
5		13	10.2	
4		26	20.5	
Total (for Average)		***43***	***33.8***	
3	Below Average School Ability	37	29.1	**2.24**
2		33	26.1	
1		14	11.0	
Total (for Below Average)		***84***	***66.2***	
Overall Total		***127***	***100***	

Grand Mean: 3.02 **Interpretation: Below Average**

With a grand mean of 3.02 and a standard deviation of 1.27, respondents' overall cognitive level is *Below Average*, which is the standard cognitive level for non-board courses like the BSIT, BSHM, and BSBA. In other words, the respondents failed to pass the standard cognitive level for courses with board exam.

College Readiness Level of the Respondents

Non-Cognitive: Tough-mindedness

Tough-mindedness has several contributing aspects, as reflected in its related primary factor scales. Tough-minded people tend to be reserved, utilitarian, grounded, and traditional (Russell and Karol, 1993).

Table 2 presents the respondents' tough-mindedness level's frequency, percentage, and mean distribution.

Table 2: Respondents' College Readiness Level in terms of Non-Cognitive Skills

TOUGH-MINDEDNESS				
STEN	**Interpretation**	**Description**	**f**	**%**
10	High Tough-Mindedness	Tough-minded, resolute, non-	0	0
9			0	0
8			4	3.1

7	High Average Tough-Mindedness	empathetic, determined	10	7.9
6	Average Tough-mindedness		31	24.4
5			45	35.4
4	Low Average Tough-Mindedness	Receptive, open-minded, intuitive	26	20.5
3	Low Tough-Mindedness		6	4.7
2			3	2.4
1			2	1.6
Overall Total			**127**	**100**

Grand Mean: 5.36 **Interpretation: Average Tough-mindedness**

Results show that more than 50 percent (n=76) of the respondents have an Average Tough-mindedness, followed by 20.5 percent (n=26) who have a Low Average Tough-mindedness; 8.6 percent (n=11) belonged to Low Tough-mindedness; 7.9 percent (n=10) have High Average Tough-mindedness, and the remaining 3.1 percent (n=4) fell into the High Tough-mindedness.

Tough-mindedness has a grand mean of 5.36. It implies that most respondents may portray a sense of being set or fixed. However, respondents high on this global factor may have difficulty accepting new viewpoints, including those involving emotions. These students may be inclined to take courses such as BSCRIM, BSIT, BSBA, BSA, and BSHM.

In contrast, respondents who belonged to Low Average to Low Tough-mindedness were considered Receptive people. They tend to deal with problems in a cultured, refined, or sensitive way. However, receptive people may overlook the practical or objective aspects of a situation.

Non-Cognitive: Self-Control. Self-control concerns curbing one's urges. It is related to being serious, rule-conscious, practical, grounded, and perfectionistic (Russell and Karol, 1993).

The same result can be gleaned from the Tough-mindedness shown in Table 3. Most respondents (59.0 percent; n=75) have an average level of Self-Control, followed by 23.6 percent (n=30) who have a Low Average Self-Control. An Average High Self-Control was obtained by 9.4 percent, while 6.3 percent of the respondents have a Low level of Self-Control, and only 1.6 percent (n=2) have a High level of Self-Control.

The non-cognitive skill has a mean of 5.48, equivalent to the average self-control level. It implies that more than 50 percent of the respondents can control themselves. Respondents with high self-control tend to inhibit their impulses and may do so in several ways. Respondents who possess this global factor were expected to be BSSW, BSN, BSED, BEED, and BSA students.

Contrarily, Low Average to Low Self-Control is those people who are unrestrained. Students who belong to these categories tend to follow their urges more. Unrestrained people may be perceived as self-indulgent, disorganized, and irresponsible. This personality trait is not a good characteristic of a college student.

Table 3: Respondents' College Readiness Level in terms of Non-Cognitive Skills

SELF-CONTROL				
STEN	**Interpretation**	**Description**	**f**	**%**
10	High Self-Control	Self-controlled, inhibiting impulses	0	0
9			0	0
8			2	1.6
7	High Average Self-Control		12	9.4
6	Average Self-Control		28	22
5			47	37
4	Low Average Self-Control	Unrestrained, impulsive, uncontrolled	30	23.6
3	Low Self-Control		8	6.3
2			0	0
1			0	0
Overall Total			**127**	**100**

Grand Mean: 5.48 **Interpretation: Average Self-Control**

Non-Cognitive: Extraversion. Extraversion has been included in even the earliest descriptions of personality. This global factor includes interpersonal warmth, liveliness, social boldness, forthrightness, and group orientation (Russell and Karol, 1993).

Table 4 revealed that more than 50 percent (n=68) of the respondents possessed an Average Extraversion. It was followed by 26.8 percent (n=34) who had a Low Average Extraversion; 11.8 percent (n=15) with a High Average Extraversion; 7.1 percent (n=9) of the respondents had Low Extraversion; and 1 respondent who had a High Extraversion.

The mean score of 5.34 indicates an average level of extraversion, implying that most of the respondents are Extroverts rather than Introverts. Extraverted students tend to be people-oriented and seek out a relationship with others. These students were supposed to be BSIT, BSSW, BSN, BSED, BEED, BSBA, and BSHM. Opposite the extraverts, introverted students tend to be less outgoing and sociable; they spend more time in their own company than others.

Table 4: Respondents' College Readiness Level in terms of Non-Cognitive Skills

EXTRAVERSION				
STEN	**Interpretation**	**Description**	**f**	**%**
10	High Extraversion	Extraverted, social participant	0	0
9			0	0
8			1	.8
7	High Average Extraversion		15	11.8
6	Average Extraversion		22	17.3
5			46	36.3
4	Low Average Extraversion	Introverted, socially inhibited	34	26.8
3	Low Extraversion		8	6.3
2			1	.8
1			0	0
Overall Total			**127**	**100**

Grand Mean: 5.34 **Interpretation: Average Extraversion**

Non-Cognitive: Independence

Independence revolves around the tendency to be actively and forcefully self-determined in one's thinking and actions. Independence has various contributing aspects such as dominance, being socially bold, vigilance, and openness to change (Russell and Karol, 1993).

The data in Table 5 concede the non-cognitive college readiness of the respondents' Independence level. It shows the same result pattern as the Self-Control and Extraversion tables above. Similarly, a significant number of respondents (62.2 percent; n=79) got an Average on their Independence level and was followed by Low Average (18.9 percent; n=24), High Average (11.0 percent; n=14), Low Independence (5.5 percent; n=7), and lastly High Independence as obtained by three (2.4 percent).

It has a grand mean of 5.77. The finding suggests that many respondents are independent, although only three got high in this global factor, while few are accommodating. As a description, independent people tend to form and express their own opinions.

Table 5: Respondents' College Readiness Level in terms of Non-Cognitive Skills

INDEPENDENCE				
STEN	**Interpretation**	**Description**	**f**	**%**
10	High Independence	Independence, persuasive, willful	0	0
9			1	.8
8			2	1.6
7	High Average Independence		14	11.0
6	Average Independence		42	33.1
5			37	29.1
4	Low Average Independence	Accommodating, agreeable, selfless, subdued	24	18.9
3	Low Independence		7	5.5
2			0	0
1			0	0
Overall Total			**127**	**100**

Grand Mean: 5.77 **Interpretation: Average Independence**

They are often persuasive and forceful. Independence is one of the requirements in all eight courses except BSA. On the other hand, respondents who have Low Average to Low Independence are the Accommodating people that tend not to question; instead, they value agreeableness and accommodation more than self-determination or getting their way.

Non-Cognitive: Anxiety

Anxiety has been described since early studies of personality and continues to be described in studies of the "big five" dimensions of personality (Goldberg, 1992; Russell and Karol, 1993). Anxiety has several contributing factors, as mentioned by Russell and Karol (1993), such as reactiveness, vigilance, apprehension, and tension.

Likewise, Table 6 shows the anxiety level of the respondents. The table entails that 52 percent (n=66) of the respondents obtained an Average level of Anxiety. Unlike the results shown in the above tables, the Anxiety level of the respondents next to the Average was High Average (28.3 percent; n=36), with a High level of Anxiety for 13.4 percent (n=17) and a Low Average Anxiety of 6.3 percent (n=8) of the respondents.

Table 6: Respondents' College Readiness Level in terms of Non-Cognitive Skills

ANXIETY				
STEN	**Interpretation**	**Description**	**f**	**%**
10	High Anxiety	High anxiety, tense, perturbable, histrionic	1	.8
9			1	.8
8			15	11.8
7	High Average Anxiety		36	28.3
6	Average Anxiety		42	33.1
5			24	18.9
4	Low Average Anxiety	Low anxiety, relaxed, imperturbable, well-adjusted	8	6.3
3	Low Anxiety		0	0
2			0	0
1			0	0
Overall Total			**127**	**100**

Grand Mean: 6.26 **Interpretation: Average Anxiety**

It has a grand mean of 6.26. Most respondents were anxious, and very few had low anxiety. Respondents, who are anxious experience more negative effect, may have difficulty controlling their emotions or reactions and may act counterproductively. BSSW, BSN, BSED, and BEED courses require average to high anxiety. Otherwise, respondents with low anxiety tend to be unperturbed; however, they may minimize the negative effect or be unmotivated to change because they are comfortable.

Summarized Non-Cognitive Level

The summarized mean distribution of the respondents' non-cognitive college readiness level, including tough-mindedness, self-control, extraversion, independence, and anxiety, reveals an average level of all personality traits. It means that the students are more or less prepared to face college regarding their non-cognitive skills. It may be the outcome of the immersion program during their Senior High, wherein they were exposed to the actual work life and was confirmed on the FGD responses.

Although the results did not show a definite personality trait, it will surely change as they experience college life. Kolb's Experiential Learning Theory emphasized in one of its propositions that *learning results from synergetic transactions between the person and the environment* (Kolb & Kolb, 2011).

Matching Between Students' College Readiness Level and the Standards for the Cognitive and Non-Cognitive Skills on College Courses

Table 8 illustrates the respondents' cognitive and non-cognitive readiness levels and the required college readiness for each course.

Table 8: Readiness Level and College Readiness Standard Set in their Chosen Course

COGNITIVE			NON-COGNITIVE		
Course	**Students' Readiness Level (Overall Mean)**	**Remark**	**Global Factors Required (STEN 5-10)**	**# of Students Who Met The Standard**	
Board Courses - Required Stanine: Stanine 4				f	%
BSA	4	Met the Standard	Tough-mindedness; Self-Control	18	69.2
BSSW	4	Met the Standard	Extraversion, Independence, Anxiety; Self-Control	2	22.2

BSED	3	Did Not Meet the Standard	Extraversion, Independence, Anxiety; Self-Control	8	34.8
BEED	3	Did Not Meet the Standard	Extraversion, Independence, Anxiety; Self-Control	4	66.7
BSN	3	Did Not Meet the Standard	Extraversion, Independence, Anxiety; Self-Control	7	33.3
BSCRIM	2	Did Not Meet the Standard	Tough-Mindedness; Independence	8	61.5
Non-Board Courses - Required Stanine: At Least Stanine 2				f	%
BSBA	3	Met the Standard	Extraversion, Independence, Tough-Mindedness	4	28.6
BSIT	3	Met the Standard	Tough-Mindedness; Extraversion; Independence	5	50.0
BSHM	3	Met the Standard	Extraversion, Independence, Tough-Mindedness	1	20.0

In the cognitive aspect, most board courses did not match the standard. However, all non-board courses reached the standard for cognitive college readiness.

Out of five (5) courses (BSA, BSSW, BSBA, BSIT, and BSHM) that met the standard for cognitive college readiness, only the BSA and BSIT were considered to have 50 percent of the respondents who possess the required personality traits. Additionally, the BSSW, BSBA, and BSHM have many respondents who failed to reconcile with the non-cognitive standard.

Courses that did not meet the cognitive standard, such as BEED and BSCRIM, had a majority of respondents that matched their non-cognitive college readiness. On the contrary, the BSED and BSN failed to meet both the cognitive and non-cognitive standards for college readiness. These results imply that only the BSA and BSIT courses reached the cognitive and non-cognitive college readiness standards.

Conclusion

The current study brings a potential view on the college readiness level among the first-year college students who underwent K-12 Program. Most respondents are not ready for college regarding their cognitive aspect since most of them got below average on their OLSAT test. On the other hand, their non-cognitive readiness level reveals that they are ready to face college life. Moreover, Accountancy and Information Technology students are considered college-ready among the courses offered.

Furthermore, mismatches on the course and OLSAT test results indicate that the admission committee in one of the private schools allows students to take the course even if they did not pass the required cognitive college readiness standard. However, those students were considered conditionals wherein their grades will be strictly monitored for the whole semester as implemented by the private school.

Additionally, students were enrolled in a course incompatible with the required personality type. It indicates that the students lack sufficient career guidance and orientation in the early years of their education. Hence, there is a clear advantage in identifying students' college readiness level by course, matching each course's standards, and highlighting students' preparation level for their chosen courses and careers.

Therefore, assessment of both cognitive and non-cognitive skills deepens the understanding of the college-readiness level of the students and should be done before they enroll in college. However, even

the most accurate assessment will not mean much without effective communication about test results to the parents, teachers, principals, counselors, admission officers, and especially students.

The findings of this study have implications on the Higher Education Institutions, through their Admission Offices, to strengthen and institutionalize readiness assessment as an entrance examination. The data from such assessment shall serve as a basis for institutional bridging and remediation program for identified college students enrolled but not cognitively prepared for college.

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A Pathway Toward Happiness for Thai Undergraduate Students during the COVID-19 Outbreak: The Role of Perceived COVID-19 Stressors and Cognitive Flexibility

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ABSTRACT

The outbreak of COVID-19 has an effect on health and functioning of undergraduate students all over the world, including Thailand, whereas the psychological attribute of cognitive flexibility has been confirmed in the literature to alleviate negative feelings from stressful situations and increase positive emotions. Therefore, the purpose of this study was to examine a pathway to happiness for Thai undergraduate students during the COVID-19 outbreak in the case where a perceived COVID-19 stressor was an exogenous variable and cognitive flexibility was a mediating variable. The study employed a cross-sectional research design with 331 Thai undergraduate students. Three questionnaires were used: (1) the COVID-19 stressor questionnaire; (2) the Cognitive Flexibility Inventory (CFI), which was divided into two components, the alternatives scale and the control scale; and (3) the Thai Happiness Indicators (THI–15). The dataset was analyzed by partial correlation and path analysis. The findings revealed that perceived COVID-19 stressors had a negative direct effect on happiness, whereas the alternative scale and control scale were mediating variables with a positive indirect effect in-between perceived COVID-19 stressors and happiness with an acceptable index of fit. These findings highlight the possibility that cognitive flexibility could assist Thai students in lowering stress and enhancing positive emotions during the epidemic. Its contribution may enable the institution to incorporate cognitive flexibility into the curriculum or implement it as a university-wide health promotion policy.

Keywords: Perceived COVID-19 stressor, Cognitive flexibility, Happiness, Path analysis, Thailand

INTRODUCTION

Since the World Health Organization (WHO) initially proclaimed the new coronavirus (COVID-19) pandemic in March 2020, it has alarmed people all across the world with its spread, severity, intensity, and lack of prompt reaction. The education sector is considered as one of the most impacted by the epidemic, affecting opportunities for growth and development for over 1.5 billion students (or 91% of the world's school population) at all educational levels (UNESCO Global Education Coalition, 2021). According to the report on COVID-19 and higher education in a global context (Ammigan et al, 2022), educational institutions were unexpectedly compelled to convert to remote and online learning as the health crisis progressed. The preparations for closing campuses, discontinuing in-person instruction, and disseminating the health and safety protocol have to be timely put into action. Due to this condition, educational institutions were forced to be in emergency response mode (Balakrishnan, 2020; Schleicher, 2020; Tadesse & Muluye, 2020).

Similar to other nations in the world, Thailand has adopted lockdown measures during the first wave of a pandemic that led to the shutdown of educational institutions nationwide and the conversion of physical classrooms to online learning. This rapid transition has somehow resulted in a learning crisis since online learning necessitates a wide range of resources and skills, including institutional infrastructure, student and teacher technology skills, learning and assessment management skills, and a positive attitude toward a new learning paradigm among all stakeholders (Nuankaew et al, 2021; Somsathan & Sanjaiprom, 2021). During this period, Thai university professors expressed concerns about the shift to online learning, the need for rapid curriculum redevelopment, peer support, and reversed university culture (Imsa-ard, 2020; Wintachai et al, 2021). Somehow, some universities appear to be unprepared, resulting in a higher dropout rate among students who lack access to necessary technological resources, tuition fees, or transportation expenses (Masatienwong & Nongtrud, 2022).

Literature from all across the world has examined the effects of the rapid transition in educational institutions on individual stress levels and mental health. Given the little time they had to prepare for online learning, institutions found it challenging to adopt new pedagogical strategies in synchronous or asynchronous contexts. Academic staff and students confront extra stress and workloads due to concerns about accessibility, affordability, flexibility, learning methods, and educational policy change (Ammigan et al, 2022). Meanwhile, studies on the stress perceptions of Thai undergraduate students indicated that the majority of them experienced moderate to high levels of stress (Choompunuch et al, 2021; Suksatan et al, 2021; Sukdee et al, 2021). The majority of the stress resulted from the modifications made to the instruction and evaluation strategies (Imsa-ard, 2020; Puranachaikere et al, 2021). Students in Thailand reported more severe stress than students in other Southeast Asian countries such as Malaysia and Indonesia, but less than students in China (Jiang et al, 2021). Thai students had the highest levels of anxiety but the lowest levels of confidence in pandemic management and accessible resources for opposing COVID-19 when compared to Indonesian and Taiwanese students (Pramukti et al, 2020). In sum, the pandemic appeared to have a significant impact on the stress and mental health of Thai students, which was likely to be considerably greater than that of students from other countries in the region.

"Cognitive flexibility" has been recommended in the literature as a strategy to minimize the negative effects of stress (Yelpaze & Yakar, 2020; Lakani & Akbari, 2021). Cognitive flexibility is one of the psychological attributes; its function, along with working memory and inhibitory control as the executive function (EF), enables people to engage in goal-directed behaviors, planning, action sequencing, decision-making, problem-solving, and creativity (Buttelmann & Karbach, 2017; Ferguson et al, 2021). In the literature, most operational definitions of cognitive flexibility highlight the ability to alter cognitive sets in response to changing environmental stimuli (Dennis & Wal, 2010). Cognitive flexibility, also known as "shifting," "attention switching," or "task switching," refers to the ability to disengage from unimportant information in one activity in order to focus on critical information in another (Buttelmann & Karbach, 2017). Throughout the life span, cognitive flexibility develops rapidly

in preschool and continues to grow through adolescence, indicating the development of neuron networks in the prefrontal cortex of the brain. Adolescents outperform children and adults in terms of cognitive flexibility in the social domain, allowing them to accept an unexpected situation more easily (Gopnik et al, 2017).

In this study, cognitive flexibility was operationally defined as the ability to alter cognitive sets in response to changing environmental stimuli, which was congruent with Dennis and Vander Wal's definition (2010). It could be divided into two components: (1) the alternatives component, which refers to the ability to perceive multiple alternative explanations and generate multiple alternative solutions to difficult situations; and (2) the control component, which refers to the ability to perceive difficult situations as controllable (Dennis & Vander Wal, 2010). Previous research found that cognitive flexibility had a direct and indirect effect on enhancing positive emotions such as happiness, altruism, and life satisfaction (Demirtaş, 2020; Yelpaze & Yakar, 2020), as well as strengthening the ability for emotional regulation and adjustment to university life among undergraduate students (Demirtaş, 2020; Yelpaze & Yakar, 2020). According to the path analysis findings, those with a higher level of distress tolerance also had a higher level of cognitive flexibility, and those with a higher level of cognitive flexibility had less problems with emotion regulation and a higher level of resilience (Arici-Ozcan et al, 2019).

Despite the literature providing strong evidence supporting the association between cognitive flexibility and positive emotions, there was a gap in the literature regarding whether (1) cognitive flexibility could still be helpful in lowering stress and increasing happiness during the educational transition to online learning as a result of the unpredictability and uncertainty of COVID-19 situations, and (2) the function of cognitive flexibility should be taken into account as either a main effect or mediating effect in the promotion of positive emotions. To fulfill the gap, this study was purposed to test the pathway to happiness for Thai undergraduate students during the COVID-19 pandemic, with a perceived COVID-19 stressor serving as an exogenous variable and cognitive flexibility serving as a mediating variable. The hypothesized model is depicted in **Figure 1**.

These insights have the potential to be useful in policy and operations. University policymakers, in particular, might use these findings to develop a policy that promotes cognitive flexibility as the new-normal learning style to increase positive emotions in the organization. For practitioners such as instructors or educational psychologists, these insights may provide guidelines for creating programs to promote student happiness by strengthening cognitive flexibility as one of the psychological strategies to overcome stressful situations such as COVID-19 or other difficult situations in the future.

OBJECTIVES OF THE STUDY

The objectives of the study could be specified as follows:

(1) To investigate the extent to which Thai undergraduate students perceive COVID-19 stressors, cognitive flexibility, and happiness
(2) To test the correlation between perceived COVID-19 stressors, cognitive flexibility, and happiness among Thai undergraduate students
(3) To test a pathway toward happiness for Thai undergraduate students during the COVID-19 outbreak in the case where a perceived COVID-19 stressor was an exogenous variable and cognitive flexibility was a mediating variable, as depicted in **Figure 1**

HYPOTHESIZED MODEL

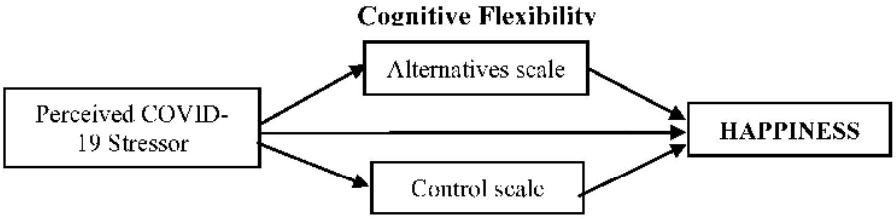

Figure 1: The hypothesized model

METHODS

Participants, Data collection procedure, and Ethics

The study recruited the participation of 331 Thai undergraduate students (61 males and 270 females) from diverse fields of study and institutions. Their ages varied from 17 to 41 years old (M = 23.79, SD = 5.30). Data was collected via online questionnaires from February to March 2022, when Thailand entered the fourth wave of the COVID-19 epidemic. At the time, the majority of students took their courses online, therefore it was a great chance to find volunteers. If their characteristics met our inclusion criteria, they were voluntarily invited to take part in this study. Regarding research ethics, the invited participants were made aware of the study's objectives, durations, anonymity, and voluntary participation, and they were given the option to withdraw at any time without a loss of benefits. Data collection was complete when the total number of participants reached the statistical recommendation.

Considerations for sample size:

According to statistical recommendations for model analysis, the sample size should be at least 300 samples, or 10–20 times the number of parameters in the model (Hair et al, 2019). In this study, as shown in **Figure 1**, seven parameters were included in the hypothesized model - three observed endogenous variables, one observed exogenous variable, and three unobserved exogenous variables. Therefore, a total of 331 participants in this study was acceptable and met the statistical criteria for sample size adequacy.

Considerations for sampling methods:

This study employed the method of purposive sampling technique to recruit participants into the study, with inclusion criteria requiring that they be (1) undergraduate students in any field of study, (2) at least 17 years old, and (3) able to access and complete the online questionnaire entirely. Those who met the inclusion criteria have been invited to voluntarily take part in the study. However, during the data collection procedure, there were 12 participants whose ages exceeded our inclusion requirement. All of that data was subsequently removed in order to maintain the homogeneity of the data set and reduce potential deviations caused by outliers. Afterwards, the participants' demographic characteristics were then examined, as shown in **Table 1**.

Table 1: The demographic characteristics of the participants

	Male (n=61)	**Female (n=270)**	**Total (n=331)**
Age (years); M (SD)	23.75 (4.78) Min=18, Max=41	23.80 (5.42) Min=17, Max=41	23.79 (5.30) Min=17, Max=41
GPA; M (SD)	2.96 (0.58) Min=1.75, Max=3.95	2.95 (0.55) Min=1.50, Max=4.00	2.95 (0.55) Min=1.50, Max=4.00

	Male (n=61)	Female (n=270)	Total (n=331)
Year of study; *f* (%)			
First year	18 (29.5%)	59 (21.9%)	77 (23.3%)
Second year	8 (13.1%)	43 (15.9%)	51 (15.4%)
Third year	14 (23.0%)	53 (19.6%)	67 (20.2%)
Fourth year	12 (19.7%)	40 (14.8%)	52 (15.7%)
Higher than fourth year	9 (14.8%)	75 (27.8%)	84 (25.4%)
Learning styles during COVID-19; *f* (%)			
Online only	41 (67.2%)	182 (67.4%)	223 (67.4%)
Onsite only	1 (1.6%)	1 (0.4%)	2 (0.6%)
Online and onsite	19 (31.1%)	86 (31.9%)	105 (31.7%)

* The unidentified number referred to the missing data.

Measures

Three measures were used for data collection in this study: (1) *the COVID-19 stressor questionnaire*; (2) the *Cognitive Flexibility Inventory (CFI)*, and (3) *the Thai Happiness Indicators (THI–15)*. Initially, both the COVID-19 stressor questionnaire and the CFI were available in English. A specialist in linguistics performed the translation method, converting all of those items into Thai and then correcting them until they were verified. Following that, data was gathered utilizing all Thai versions of the measures. Furthermore, all the measures had their psychometric properties examined to ensure they were qualified and suitable for use in this study.

1. The COVID-19 stressor questionnaire: The questionnaire was developed by Yong and Suh (2022) to examine students' stress over the impact of COVID-19 on their personal function and well-being. It consisted of 23 items on a 5-point Likert scale and was divided into four domains: (1) resource restrictions, (2) social constraints, (3) future uncertainties, and (4) health concerns. The higher scores represented the higher stress of the students. The psychometric properties of the original version of the COVID-19 stressor questionnaire ensured convergent validity and predictive validity (Yong and Suh, 2022). This study further investigated its internal reliability in the pilot study with 30 Thai undergraduate students. The Cronbach's alpha revealed a value of.945, indicating a very high level of internal consistency.

2. The Cognitive Flexibility Inventory (CFI): the questionnaire was developed by Dennis & Vander Wal (2010) to measure cognitive flexibility, which is defined as the ability to alter cognitive sets in response to changing environmental stimuli. The CFI consisted of 20 items with 7-point Likert scales and was divided into two components: (1) the alternatives component (13 items) and (2) the control component (7 items). In the hypothesized model, as shown in **Figure 1**, each component of CFI was formed as a mediating variable, indirectly encompassing the influence of the COVID-19 stressor (as an exogenous variable) on the student's happiness (as an endogenous variable). The higher the score, the greater the level of cognitive flexibility. The psychometric properties of the CFI original version showed strong construct validity and concurrent validity, as well as high internal consistency and test-retest reliability (Dennis & Vander Wal, 2010). This pilot study with 30 Thai undergraduate students has so far been taking internal consistency into account. The Cronbach's alpha revealed a value of .890, indicating a very high level of internal consistency.

3. The Thai Happiness Indicators (THI–15): the questionnaire was developed by Thailand's Department of Mental Health (2007) to measure the experience and feeling of happiness during the previous 30 days. The THI-15 was available on the website of Thailand's Department of Mental Health. It consisted of 15 items on a 4-point Likert scale. The higher scores represented the greater happiness of students. The original version of the THI-15 was verified using content validity, construct validity, concurrent validity, and internal consistency, all of which were moderate to relatively high (Thailand's Department of Mental Health, 2007). This study provided an investigation into its reliability with 30

Thai undergraduate students in the pilot study. The Cronbach's alpha revealed a value of .777, indicating a high level of internal consistency.

In conclusion, all the three measures achieved the criteria for high psychometric property indices, making them appropriate for use in this study.

Data analysis

The data were analyzed using (1) descriptive statistics (frequency, percentage, means, and standard deviation) to explain participant demographics and relevant variable scores; (2) partial correlation to analyze the relationship between those variables; and (3) path analysis with AMOS to analyze model fit. Finally, the model's robustness and modification were assessed using fit indices, including the chi-square test, CMIN/df, GFI, AGFI, NFI, and RMSEA.

RESULTS

In alignment with the research objectives, these findings were divided into three sections: (1) interpretation of the scores on perceived COVID-19 stressors, cognitive flexibility, and happiness in Thai undergraduate students; (2) a test of correlations among all relevant variables; and (3) a test of path analysis.

Finding 1: Interpretation of the scores

As shown in **Table 2**, the data was interpreted using the subscale scores and composite scores for the perceived COVID-19 stressors, cognitive flexibility, and happiness. The independent t-test was also available to examine gender differences, and the results showed no statistically significant differences between males and females for any of those subscale scores and composite scores. This suggested the homogeneity of the data set. Although it appeared that there were more females than males, their statistics followed the same pattern. Thus, the issue of gender inequality seemed to be lessened.

Table 2: Interpretation of the scores on perceived COVID-19 stressors, cognitive flexibility, and happiness

Variables of interest	Possible score	Mean (SD) and Interpretation			t	p-value
		Male (n=61)	Female (n=270)	Total (n=331)		
Perceived COVID-19 stressors	23-115	71.25 (21.23) Moderate	71.78 (19.67) Moderate	71.68 (19.94) Moderate	-.189	.850
Resource restrictions	5-25	14.02 (4.81) Moderate	13.58 (4.75) Moderate	13.66 (4.76) Moderate	.650	.516
Social constraints	7-35	21.05 (7.47) Moderate	21.23 (6.89) Moderate	21.20 (6.99) Moderate	-.182	.856
Future uncertainties	6-30	19.84 (6.12) Moderate	19.94 (5.88) Moderate	19.92 (5.92) Moderate	-.125	.901
Health concerns	5-25	16.34 (5.36) Moderate	17.03 (4.77) High	16.91 (4.88) Moderate	-.924	.358
Cognitive flexibility	20-140	87.62 (20.72) Moderate	90.04 (17.90) Fairly good	89.59 (18.44) Fairly good	-.923	.357
Alternatives	13-91	55.48	58.74	58.14	-1.242	.215

Variables of interest	Possible score	Mean (SD) and Interpretation			t	p-value
		Male (n=61)	Female (n=270)	Total (n=331)		
Control	7-49	(20.29) Moderate 32.15 (5.13) Fairly good	(18.10) Fairly good 31.30 (5.60) Fairly good	(18.54) Fairly good 31.46 (5.52) Fairly good	1.083	.280
Happiness	0-45	28.07 (7.18) Moderate	29.89 (6.83) Moderate	29.56 (6.92) Moderate	-1.868	.063

* The "possible score" referred to the range between the lowest and highest scores for each scale.
** Since there was no cut-off score for the scale of Perceived COVID-19 stressors and Cognitive flexibility Inventory (CFI), the score interpretation was determined using the equation = (max-min)/number of categories
*** The Happiness score was interpreted using the THI-15 classification scores (Thailand's Department of Mental Health, 2007)

Finding 2: Test of correlation

This study employed partial correlation to measure the intensity and direction of a linear relationship between two variables whilst controlling for the effect of the third variable (also known as 'covariates'). The results of partial correlation, as shown in **Table 3**, demonstrated a significant relationship between perceived COVID-19 stressor and cognitive flexibility in the subscale of alternative and control, after controlling for the impact of the happiness variable (r_{xy} = .353, p-value < .001 and r_{xy} = -.367, p-value < .001, respectively). These findings support the notion that the greater one's cognitive flexibility, the less stress one experiences. There was also a significant relationship between cognitive flexibility and happiness after controlling for the impact of perceived stress (r_{xy} = .380, p-value < .001 and r_{xy} = .319, p-value < .001, respectively), pointing to a positive relationship between both variables. It could be implied that more cognitive flexibility will lead to greater happiness. The results of these partial correlations served as a basis for the path analysis that followed.

Table 3: The partial correlation analysis among perceived COVID-19 stressors, cognitive flexibility, and happiness

	[1]	[2]	[3]	[4]
[1] Perceived Stressors	1			
[2] CF Alternative	.353** (p-value < .001)	1		
[3] CF Control	-.367** (p-value < .001)	-.041 (p-value = .442)	1	
[4] Happiness	-.198** (p-value < .001)	.380** (p-value < .001)	.319** (p-value < .001)	1

** p-value < .01; * p-value < .05
CF alternative referred to the alternative scale of cognitive flexibility, and **CF control** referred to the control scale of cognitive flexibility.

Finding 3: Test of path analysis

Path analysis has been used to evaluate theoretical causal models through which exogenous variables produce both direct and indirect effects on an endogenous variable. In this study, the path analysis has been used to evaluate a pathway toward happiness for Thai students during the COVID-19 pandemic in a case where a perceived COVID-19 stressor was an exogenous variable, cognitive flexibility was a mediating variable, and happiness was an endogenous variable. The interpretation of the path analysis required three steps: (1) verifying the normality of model variables; (2) analyzing each model pathway; and (3) evaluating the overall model fit.

Verifying the normality of model variables

Path analysis requires multivariate normality assumptions, represented by the normal distribution of the residuals. A probability plot of quantile-quantile (Q-Q) or probability-probability (P-P) could be used to examine multivariate normality when all of the points plotted on the graph perfectly lie on the diagonal line. According to these study findings, the Q-Q plot and P-P plot appeared to be close to the diagonal line, confirming multivariate normality. Further analysis of each variable showed that its skewness ranged from -.543 to.021, and its kurtosis ranged from -.999 to.618 (in line with the normality criterion of -1 to 1 for skewness and -3 to 3 for kurtosis by Hair et al., 2019). These assured that all variables in the model were normal distribution.

Analyzing each model pathway: direct and indirect effects on the endogenous variable

The interpretation for each model pathway was presented in **Table 4**. All of the pathways were statistically significant (p-value < .001), indicating a strong relationship between the variables in the model.

Direct effect: The significant direct effect was found on the *Happy <-- CF alternative* with a standardized coefficient of.394 and the *Happy <-- CF control* with a standardized coefficient of.357, confirming that cognitive flexibility either in the subscale of alternative or control was able to increase happiness in Thai students. Meanwhile, a significant direct effect was found on *CF control <-- stress* with a standardized coefficient of -.422 (in the negative direction), indicating that the cognitive flexibility in the control subscale was able to decrease students' stress during the COVID-19 crisis.

Indirect effect: only one indirect pathway was found from *Happy <-- Stress*, with a total standardized coefficient of -.240 (the direct standardized coefficient of -.190 and the indirect standardized coefficient of -.050). According to this pathway, perceived COVID-19 stressors could have direct and indirect effects on students' happiness. Meanwhile, cognitive flexibility, whether in the alternative or control subscale, could be able to counteract this effect by having a positive influence on the happiness of the students.

Table 4: The coefficients in the path analysis model

Pathway	Direct		Indirect		Total		Regression coff.		p-value
	Unstd.	Std.	Unstd.	Std.	Unstd.	Std.	Unstd.	Std.	
CF alternative <-- Stress	.236	.256			.236	.256	.236	.256	< .001
CF control <-- Stress	-.115	-.422			-.115	-.422	-.115	-.422	< .001
Happy <-- Stress	-.066	-.190	-.017	-.050	-.083	-.240	-.066	-.190	< .001
Happy <-- CF alternative	.147	.394			.147	.394	.147	.394	< .001
Happy <-- CF control	.452	.357			.452	.357	.452	.357	< .001

coff. = coefficients, **unstd.** = unstandardized regression coefficients, and **std.** = standardized regression coefficients
Stress referred to perceived COVID-19 stressors, **CF alternative** referred to the alternative scale of cognitive flexibility, and **CF control** referred to the control scale of cognitive flexibility.

Evaluating the overall model fit

As regards to the evaluation of the overall model fit, the findings of path analysis revealed that perceived COVID-19 stressors had a negative direct effect on happiness, whereas the alternative and control scale of cognitive flexibility were mediating variables with a positive indirect effect in-between perceived COVID-19 stressors and happiness, with an acceptable index of fit (chi-square =.596, p-value = .440; CMIN/df = .596; GFI = .999; AGFI = .991; NFI =.997; RMSEA < .05), as depicted in **Figure 2**.

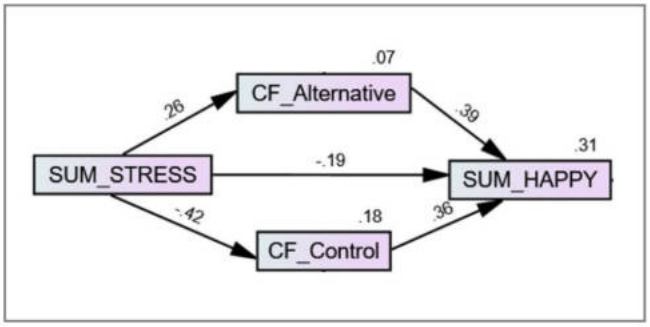

Figure 2: The verified path analysis model
The model's values were standardized regression coefficients
and all of the pathways were statistically significant (p-value < .001)

DISCUSSION

The findings showed that in the crisis situation of the COVID-19 outbreak, Thai undergraduate students perceived this situation as a moderate stressor, resulting in a decrease in their happiness. Meanwhile, cognitive flexibility appeared to be the mediating factor in compromising the influence of perceived COVID-19 stressor and happiness, enabling the students to cope with the epidemic by reducing stress and increasing positive emotions.

Perceptions of stress during the COVID-19 epidemic among Thai undergraduate students

As in other nations throughout the world, Thailand has changed its educational management and system in reaction to the COVID-19 pandemic. According to some experts, this situation will usher in a new era of *the next normal education*, with the most significant change occurring through online distance learning and emergency remote education. All educational levels, including higher education, have this as a necessity (Bozkurt & Sharma, 2020; Pacheco, 2021; Rapanta et al, 2021). These put pressure on both educators and students to immediately shift from in-person instruction to distance online learning.

This study demonstrated the level of stress Thai undergraduate students experienced as a result of the education system's forced transition to online distance learning in response to COVID-19. The findings showed that perceived stress was ranked at a moderate level (see **Table 2**), which was consistent with other studies undertaken during a comparable time period (Choompunuch et al, 2021; Suksatan et al, 2021; Sukdee et al, 2021). These might imply that students felt pressured and stressed because of the unpredictability of the COVID-19 situation and the uncertain teaching and evaluation procedures used in response to this COVID-19 variation situation (Imsa-ard, 2020; Puranachaikere et al, 2021).

Furthermore, this study identified the stressors that were brought on by resource restrictions, social constraints, future uncertainties, and health concerns (see **Table 2**). The identification of the specific COVID-19 stressors has enabled researchers to better comprehend the underlying mechanisms, thus enabling them to offer services targeted at these specific stressors. As suggested by Yong & Suh (2022), promoting university students' mental health directed to the specific stressors entails (1) locating useful and informative resources to assist them with day-to-day living, (2) motivating them to maintain connections with others in creative manners, (3) raising their tolerance for future uncertainty, and (4) addressing their health concerns and directing them to accurate and trustworthy sources of information.

Cognitive flexibility: the direct and indirect effects on perceived COVID-19 stressors and happiness (the pathway analysis)

The study revealed that cognitive flexibility among Thai undergraduate students was fairly high, with females appearing to perform somewhat better than males on the subscale of alternatives but lower than males on the subscale of control (see **Table 2**). These might imply characteristics that female students appear to have a variety of explanations and solutions for difficult situations, whereas male students appear to regard difficult situations as controllable (Dennis & Vander Wal, 2010). However, considering that these differences were not statistically significant, it was difficult to draw conclusions and suggest further investigation.

The direct and indirect correlation between perceived COVID-19 stressor, cognitive flexibility, and happiness was presented (see **Table 3 and 4**). It was found that cognitive flexibility presented a significant positive correlation with happiness, whereas the subscale of control presented a significant negative correlation with perceived COVID-19 stressor. Furthermore, analyzing the pathway analysis toward happiness for Thai students during the COVID-19 epidemic in the case where perceived COVID-19 stressor was an exogenous variable and cognitive flexibility was a mediating variable, contributed to the achievement of the main research objective. (see **Table 4** and **Figure 2**). According to the findings of the path analysis, the data set supported a causal model with an appropriateness index of fit (chi-square =.596, p-value =.440; CMIN/df =.596; GFI =.999; AGFI =.991; NFI =.997; RMSEA.05). These results imply that cognitive flexibility in both the alternative and control subscales could be able to raise happiness for students. Meanwhile, the indirect effect of cognitive flexibility was also able to mitigate the impact of the students' perceived COVID-19 stressor on their happiness.

These findings on the direct and indirect effects of cognitive flexibility on happiness were in line with previous findings (Demirtaş, 2020; Yelpaze & Yakar, 2020). It supports the notion that cognitive flexibility is an important attribute that helps people complete difficult tasks such as multitasking and come up with inventive and adaptive solutions to changing demands (Ionescu, 2012). Cognitive flexibility is also regarded as a core competency for dealing with crises, like higher education students' adaptability to the COVID-19 outbreak (Brashear & Thomas, 2022). It enables people to come up with a variety of alternative solutions to difficult situations and to perceive them as controllable (Dennis & Vander Wal, 2010), which leads to improved emotional regulation and a higher level of resilience (Arici-Ozcan et al, 2019) as well as enhancing an individual's ability to cope with challenging circumstances (Demirtaş, 2020).

Limitations and recommendations for future studies

Aside from its strengths, the current study includes limitations that should be considered when interpreting the findings. (1) The study utilized a cross-sectional design to ascertain the causal relationship between the relevant variables; the limitation on depicting the dynamic arising from COVID-19 variation may not be well described. Future research may take into account a longitudinal study to examine these dynamics over a variation of COVID-19 situations. (2) Despite the fact that this study identified cognitive flexibility as one of the essential skills for handling a crisis, no intervention program that specifically targets improving cognitive flexibility has yet to be developed. Future research may address that issue by aiming to develop a program of cognitive flexibility intervention and evaluating its effectiveness using an experimental approach. Lastly, (3) due to the variation of the COVID-19 situation, a diverse variety of internal and external factors may have an effect on people's happiness and well-being. To acquire a thorough understanding of the concern that has been evolving over time, those variables may be incorporated into the model and tested for their relationship using advanced statistics such as SEM or multilevel analysis.

Practical implications

In terms of potential implications for educational institutions, the findings of this study pointed to cognitive flexibility as one of the key factors influencing the effect of the perceived COVID-19 stressor on student happiness, both directly and indirectly. Universities could use these findings to: (1)

incorporate cognitive flexibility as a subject in the curriculum; and/or (2) broaden the scope of current lessons to include knowledge of cognitive flexibility and its application both in and outside of the classroom. (3). In terms of policy implications, universities may encourage cognitive flexibility as the new normal learning style to promote positive emotions among faculty and students. Finally, (4) counseling units at universities may broaden their services to cover not only people at high risk of mental health problems, but also preventative programs that combine cognitive flexibility and positive psychology to promote an individual's holistic well-being.

CONCLUSION

Cognitive flexibility, one of the psychological attributes regarding the ability to alter cognitive sets in response to changing environmental stimuli (Dennis & Vander Wal, 2010), has been recommended in the literature as a core competency for dealing with crises (Brashear & Thomas, 2022). However, there was a gap in the literature regarding (1) whether cognitive flexibility could still be useful in reducing stress and enhancing happiness during the educational transition to online learning as a result of the unpredictability and uncertainty of COVID-19 situations, and (2) whether its role in the promotion of positive emotions should be considered as either a main effect or a mediating effect. To fulfill the gap, this study was purposed to test the pathway to happiness for Thai undergraduate students during the COVID-19 pandemic, with a perceived COVID-19 stressor serving as an exogenous variable and cognitive flexibility serving as a mediating variable.

The result from the path analysis with 331 Thai undergraduate students revealed that the data set supported a causal model with an appropriateness index of fit, highlighting the cognitive flexibility in both the alternative and control subscales that could be able to raise happiness for students. Meanwhile, the indirect effect of cognitive flexibility was also able to mitigate the impact of the students' perceived COVID-19 stressor on their happiness.

These insights have the potential to be useful for educational institutions. Universities could be able to apply these findings to incorporate cognitive flexibility as a subject in the curriculum. The counseling units at universities may broaden their services by providing a cognitive flexibility promoting program to foster an individual's holistic well-being. In terms of policy implications, universities may encourage cognitive flexibility as the new normal learning style to promote positive emotions among faculty and students.

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Assessment of Professional Learning Teams: The College of Education Experience

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ABSTRACT

In the recent professional development training, professional learning communities were recognized as a strategy for school development and student achievement. This descriptive exploratory study establishes the practices of PLT in the Education Department, College of Liberal Arts, Science, and Education (CLASE). The attempts of leadership and teacher collaboration, professional learning, and development were investigated. All 21-full time faculty members were the participants in this study. They answered the 52-item Likert type of questionnaire adopted from Antinluoma, Ilomaki, and Toom (2021). Researchers sent Informed consent forms to the participants before the conduct of the study. Results showed that the academic supervisor is described as a visionary leader who started the positive creation, shared the leadership, and created the commitment to common departmental goals. Change in leadership is seen to have a positive effect. Decision-making processes were collaborative, cooperative, inclusive, and democratic. Relationship among faculty members is based on mutual trust and openness. Each faculty is encouraged to express their opinions. Shared responsibility of faculty members, peer mentoring, encouragement, cooperation, and peer-teaching were practiced in both online and face-to-face strategies. Frequent online collaboration and communication were channels of effective professional learning engagements. The findings of this study present how other educational institutions can learn from the data in creating an environment that is proactive for teachers' professional practice, given the background of the professional learning communities' construct by which teachers can gain professional learning and development. The PLT serves as a process from which the department must continuously derive its development mechanism.

Keywords: Professional Learning Teams, College of Education, leadership and teacher collaboration

Introduction

Professional learning communities (PLCs) are approaches to improving the school community where teachers, in collaboration with one another, work together to improve student outcomes. In the learning communities, the members meet regularly and engage in collaborative professional learning to strengthen their practice to improve student performance. Research emphasizes teacher collaboration's importance (Dallat et al., 2000; Hairon & Tan, 2015; Higgins, 2016). In the exercise of the learning communities, a cycle of continuous improvement, engagement in inquiry, action research, planning, reflection, assessment, and evaluation, is done. These activities allow educators to determine student needs, identify shared goals of the academic community, select and implement evidence-based strategies, apply learning, monitor student performance, and evaluate results.

Pirtle and Tobia (2012) assert that school leaders who seek to improve student gains are often overwhelmed with well-intentioned programs and support the promise of producing rapid results. And so, for the most part, it is imperative that determining the best structures, supports, and approaches to promote student learning outcomes while fostering an improved school culture and at the same time developing teachers' instructional expertise is a substantial undertaking. In many sources, it is reflected that the use of PLCs offers a more effective, learning-focused process that may foster improvement in both teaching and learning (Cowan, Joyner, & Beckwith, 2012; Harris & Jones, 2010; Hord & Tobia, 2012; Resnick, 2010; The Wallace Foundation, 2012).

In the University of San Agustin, specifically in the Education Department, the researchers believe that the creation of the professional learning communities in the university has offered a meaningful infrastructure where teachers can engage in professional dialogues, do feedback, reflect on and improve their teaching and learning encounters. Most of all, learn how to become more effective in the classroom in aid of instruction and improved student outcomes.

Therefore, this paper looks into the experience of PLCs through the department's version, the Professional Learning Teams (PLT), aiming to collaborate, promote the professional learning community process, and improve instruction for enhanced student achievement.

Statement of the Problem

This study assessed the experience of professional learning teams (PLT) in the Education department, University of San Agustin, Iloilo City. This investigation addresses the following questions:

1) What is the shared vision created?
2) What is the shared leadership?
3) What is the structure enabling the development of PLT?
4) What is the collective learning and application?
5) What is the shared personal practice?
6) What are the supportive conditions and relationships?
7) What are the supportive conditions and structures?

Methodology

This is in an exploratory study that relied on evidences of practices of 21 full time faculty members comprising the Professional Learning Teams (PLT). All the full time faculty members signified their intent to join this study. The part time faculty members, however, were not included. This study is inspired by an earlier study of Antinluoma, Ilomaki, and Toom (2021) entitled *Practices of Professional Learning Communities*. This study aims to complete and deepen the understanding of faculty members in the Education Department about the importance of PLCs. The research instrument was based on the

study of Antinluoma, Ilomaki, and Toom (2021). Thus, this study explores on this area and other sources of evidence: first, the launch of the departmental group chat in the Messenger to make it possible for all data and information to be shared, discussed, collaborated with, and verified. Second, evidences from some teacher-interviews for this study. Interviews are an important source of evidences as reinforcements to the survey conducted. Yin (2014; in Antinluoma et al., 2021) states that key informants can provide important insights to human affairs or actions. Third, the data was collected with a PLC survey, which consisted of 52 questions on a Likert scale. All 21 faculty members answered the survey.

The following scale and interpretations are presented below to assess how PLC is done in the Education Department at the University of San Agustin.

Scale	Description
4.21- 5.00	Practiced to an excellent extent
3.41- 4.20	Practiced to a great extent
2.61- 3.40	Practiced to a moderate extent
1.81- 2.60	Practiced to less extent
1.00- 1.80	Not practiced

Results & Discussion

Professional Learning Communities

Research points to the observation that there has been no universal definition of PLCs. It has been defined differently based on institutions and organizational environments. However, in this study, PLC refers to a group of professionals who discuss their practice and experiences in student learning in a systematic, continuous, collaborative, and reflective manner (Dufour, 2004; Morrisey, 2000; in Dogan, Tatik, & Yurtseven, (2017). Basically, in the context of the university, PLCs started as an effort to promote teacher learning to meet student's needs, more or less similar to the context discussed in the professional learning communities advanced by Vescio, Ross, & Adams (2008; in Dogan, Tatik, & Yurtseven, 2017).

Consistent with what experts described as PLC, the researchers utilized the same framework following the six dimensions such as (a) shared and supportive leadership, (b) shared values and vision, (c) collective learning and application, (d) shared personal practice, (e) supportive conditions: relationships, and (f) supportive conditions: structures (Hord, 1997, 2008; Morrisey, 2000; Hipp & Huffman, 2003; Olivier et al., 2009; Olivier et al., 2010; in Dogan, Tatik, & Yurtseven, 2017). There may be a tendency that the name of the dimensions may differ from one author to another, but the core principles of PLCs anchor on professionalism, community, and learning always stay strong (Hord & Sommers, 2008; in Dogan, Tatik, & Yurtseven, 2017).

Table 1 reflects the summary of the PLTs' dimensions as a result of the assessment in the Education Department, University of San Agustin. Based on the results, Supportive conditions-Relationship was rated the highest with a mean of 3.54; SD=0.65 with an interpretation of practiced to a great extent. The component with the lowest rating is Shared and Supportive Leadership, with a mean of 3.34; SD=0.67 and interpreted as practiced to a moderate extent. The rest of the dimensions are practiced to a moderate extent to a great extent, with means ranging from 2.61 – 350; SD ranging from 0.53 to 0.76.

Table 1: Summary of the PLC Categories

Components	Mean	SD
Shared and supportive leadership	3.34	0.67
Shared values and vision	3.45	0.53
Collective Learning and Application	3.44	0.76
Shared Personal Practice	3.50	0.57
Supportive Conditions-Relationship	3.54	0.65
Supportive conditions- structural	3.44	0.66

Legend: 4.21- 5.00 Practiced to an excellent extent; 3.41- 4.20 Practiced to a high extent; 2.61- 3.40 Practiced to a moderate extent; 1.81- 2.60 Practiced to less extent, and 1.00- 1.80 Not practiced

Shared and Supportive Leadership

Shared and supportive leadership takes place in stakeholder interactions. This dimension may occur between administrators and teachers, academic supervisors and teachers, administrators and academic supervisors, and academic supervisors and parents, among others. As the academic supervisor exercises her leadership, leadership undergoes a shared experience. Table 2 shows the different experiences under shared and supportive leadership.

Results show that the department is highest in "decision-making takes place through communities and across grade" with 3.62: SD = 0.74 and lowest in "staff members have accessibility to key information" with a mean of 3.00; SD = 0.63. Table 2 reflects the data.

Table 2: Shared and Supportive Dimension

Shared and Supportive Leadership	Mean	SD
Staff members are consistently involved in discussing and making decisions about most school issues.	3.32	0.68
The principal incorporates advice from staff members to make decisions.	3.29	0.56
Staff members have accessibility to key information.	3.00	0.63
The principal is proactive and addresses areas where support is needed.	3.52	0.60
Opportunities are provided for staff members to initiate change	3.10	0.70
The principal shares responsibility and rewards for innovative actions.	3.43	0.6
The principal participates democratically with staff sharing power and authority.	3.33	0.73
Leadership is promoted and nurtured among staff members.	3.43	0.68
Decision-making takes place through committees and communication across grade	3.62	0.74
Stakeholders assume shared responsibility and accountability for student learning without evidence of imposed power and authority.	3.33	0.66
Staff members use multiple sources of data to make decisions about teaching and learning.	3.33	0.66
Average	3.34	0.67

Legend: 4.21- 5.00 Practiced to an excellent extent; 3.41- 4.20 Practiced to a high extent; 2.61- 3.40 Practiced to a moderate extent; 1.81- 2.60 Practiced to less extent, and 1.00- 1.80 Not practiced

In the department, shared and supportive leadership address the team's voluntary cooperation and interaction based on their perceived sense of responsibility. Academic leadership positively affects the

teachers' commitment to the shared goals in their engagement with their students and each other. Among those who participated in the study, they highlighted that "there was a strong collaboration between the academic leader and the faculty members," "open communication really works," and "leadership fosters openness to suggestions, requests, and other work-related issues."

Shared Values and Vision

The shared values and vision refer to a sense of common vision, mission, purpose, belief, value, and practices among the academic community members. In a community, shared values and vision and the integration of the other essential aspects must be realized for PLC to succeed. Conflict may arise if any member of an academic community lacks a complete understanding of the shared goal and vision. A more systematic flow of educational processes and practices must be a commitment in the academic environment that all must share. Table 3 shows the shared values and vision of the department in this academic institution. Highest in both "decisions are made in alignment with the school's values and vision" and "school goals focus on student learning beyond test scores and grades," with means of 3.71; SD = 0.46. And the lowest dimension is "stakeholders are actively involved in creating high expectations that serve to increase student achievement" with a mean of 3.38; SD 0.59.

Table 3: Shared Values and Vision

Shared Values and Vision	Mean	SD
A collaborative process exists for developing a shared sense of values among staff.	3.57	0.60
Shared values support norms of behavior that guide decisions about teaching and learning.	3.67	0.48
Staff members share visions for school improvement that have an undeviating focus on student learning.	3.48	0.60
Decisions are made in alignment with the school's values and vision.	3.71	0.46
A collaborative process exists for developing a shared vision among staff.	3.52	0.6
School goals focus on student learning beyond test scores and grades.	3.71	0.46
Policies and programs are aligned to the school's vision.	3.67	0.48
Stakeholders are actively involved in creating high expectations that serve to increase student achievement.	3.38	0.59
Data are used to prioritize actions to reach a shared vision.	3.62	0.50
Average	3.45	0.53

Legend: 4.21- 5.00 Practiced to an excellent extent; 3.41- 4.20 Practiced to a high extent; 2.61- 3.40 Practiced to a moderate extent; 1.81- 2.60 Practiced to less extent, and 1.00- 1.80 Not practiced

Studies have pointed out that a positive school climate and culture may affect student achievement (Wang and Degol, 2016 in Antinluoma, 2021). It is stated that the vision, mission, and values of a particular school, give the direction in which the school is heading. These are a school's direct articulation and must be shared by the school community and its stakeholders. Leaders must establish how the community members must help and collaborate to realize these statements. Participants shared that "the ability to work collaboratively with the staff and other stakeholders is essential in school reforms," "there is some kind of consultancy between the academic supervisor and the teachers regarding the department's concerns," and "Objectives of any project must be aligned to the vision,

mission, goals of the university," and "cooperation is observed for the success of any academic endeavor."

Collective Learning and Application

In this dimension, all the members of the PLC have to be learners with their colleagues. Communal interaction, coffee breaks of learning, debates, informal chats, peer teaching, feedbacking, and sharing can be forms of collective learning and strategies. In this dimension, collaboration is the key. Engaging with one another, interacting, and interpreting results have to be accomplished on an iterative basis. Table 4 shows the collective learning and application practices. Table 4 also shows collective learning and application. The highest dimension was "Collegial relationships exist among staff members that reflect commitment to school improvement efforts," with a mean of 3.71; SD = 0.46. And the lowest dimension is "Staff members collaboratively analyze student work to improve teaching and learning," with a mean of 3.33; SD: 0.8.

Table 4: Collective Learning and Application

Collective Learning and Application	Mean	SD
Staff members work together to seek knowledge, skills and strategies and apply this new learning to their work.	3.48	0.75
Collegial relationships exist among staff members that reflect commitment to school improvement efforts.	3.71	0.46
Staff members plan and work together to search for solutions to address diverse student needs.	3.43	0.75
A variety of opportunities and structures exist for collective learning through open dialogue.	3.38	0.8
Staff members engage in dialogue that reflects a respect for diverse ideas that lead to continued inquiry.	3.38	0.92
Professional development focuses on teaching and learning.	3.38	0.8
School staff members and stakeholders learn together and apply new knowledge to solve problems.	3.38	0.8
School staff members are committed to programs that enhance learning.	3.48	0.75
Staff members collaboratively analyze multiple sources of data to assess the effectiveness of instructional practices.	3.43	0.81
Staff members collaboratively analyze student work to improve teaching and learning.	3.33	0.8
Average	3.44	0.76

Legend: 4.21- 5.00 Practiced to an excellent extent; 3.41- 4.20 Practiced to a high extent; 2.61- 3.40 Practiced to a moderate extent; 1.81- 2.60 Practiced to less extent, and 1.00- 1.80 Not practiced

The teachers shared that "collective learning in a workplace is essential because individuals who share information can work together efficiently," "consultation is collective, especially if about students' concerns," and "everyone in the department helps each other in enhancing teaching and learning," Even with the challenge of the pandemic, the members still show their effort to accomplish their responsibilities in the best way they can," and "with strong collaboration, the success of any activity can be achieved."

Shared Personal Practice

This dimension illustrates the PLCs' focus on students' learning, how their collaborative efforts have identified the issues, challenges, and problems, and how teachers, as a community, can advance solutions to address some of these issues, problems and challenges. This dimension gives each member of the PLC to share their best practice/s as well as those they consider experiences for others to learn from. Table 5 shows most of their shared personal practice. The highest dimension was "Opportunities exist for coaching and mentoring," with a mean of 3.71; SD = 0.46. And the lowest dimension is "Staff members provide feedback to peers related to instructional practices," with a mean of 3.38; SD: 0.59.

Table 5: Shared Personal Practice

Shared Personal Practice	Mean	SD
Opportunities exist for staff members to observe peers and offer encouragement.	3.48	0.6
Staff members provide feedback to peers related to instructional practices.	3.38	0.59
Staff members informally share ideas and suggestions for improving student learning.	3.43	0.51
Staff members collaboratively review student work to share and improve instructional practices.	3.43	0.6
Opportunities exist for coaching and mentoring.	3.71	0.46
Individuals and teams have the opportunity to apply learning and share the results of their practices.	3.52	0.6
Staff members regularly share student work to guide overall school improvement.	3.52	0.6
	3.50	0.57

Legend: 4.21- 5.00 Practiced to an excellent extent; 3.41- 4.20 Practiced to a high extent; 2.61- 3.40 Practiced to a moderate extent; 1.81- 2.60 Practiced to less extent, and 1.00- 1.80 Not practiced

The Teacher Mentoring Program is a piece of evidence that this dimension of the PLC is very much alive in the department. "Teachers' interaction within a formalized structure for collegial coaching/mentoring is effective to professional learning communities," shared one teacher. While many teachers agreed that "mentoring exists among us," "Sharing of experiences to improve teaching-learning is encouraged," and through "coaching and monitoring, opportunities to learn new ideas are made possible."

Supportive Conditions - Relationship

In this dimension, supportive conditions include the place, time, and activities teachers share as part of their PLC experiences. Hord (1997, in Dogan, Tatik, & Yurtseven, 2017) suggests the types of conditions to meet. These are relationships and structures. In the relationships, PLCs must thrive in an environment of openness, open-mindedness, and commitment to the PLC goals. Structures refer to the physical conditions teachers may provide to help them fulfill their commitments to PLC. These may include a standard time, a familiar place, and other channels for teachers to communicate and collaborate. Tables 6 and 7 reflect these practices—tables 6 & 7 show supportive conditions in the relationship and structure. The highest dimension was "Relationships among staff members support honest and respectful examination of data to enhance teaching and learning," with a mean of 3.62; SD = 0.59. And the lowest dimension is "A culture of trust and respect exists for taking risks," with a mean of 3.48; SD= 0.60.

Table 6: Supportive Conditions-Relationship

Supportive Conditions-Relationship	Mean	SD
Caring relationships exist among staff and students that are built on trust and respect.	3.57	0.60
A culture of trust and respect exists for taking risks.	3.48	0.60
Outstanding achievement is recognized and celebrated regularly in our school.	3.52	0.75
School staff and stakeholders exhibit a sustained and unified effort to embed change into the culture of the school.	3.52	0.75
Relationships among staff members support honest and respectful examination of data to enhance teaching and learning.	3.62	0.59
Average	3.54	0.65

Legend: 4.21- 5.00 Practiced to an excellent extent; 3.41- 4.20 Practiced to a high extent; 2.61- 3.40 Practiced to a moderate extent; 1.81- 2.60 Practiced to less extent, and 1.00- 1.80 Not practiced

Supportive Conditions-Structural

Table 7 shows supportive conditions in the structure. The highest dimension was "Resource people provide expertise and support for continuous learning," with a mean of 3.67; SD = 0.48. And the lowest dimension is "Appropriate technology and instructional materials are available to staff," with a mean of 3.19; SD= 0.68.

Table 7: Supportive Conditions-Structural

Supportive Conditions-Structural	Mean	SD
Time is provided to facilitate collaborative work.	3.52	0.75
The school schedule promotes collective learning and shared practice.	3.29	0.64
Fiscal resources are available for professional development.	3.48	0.75
Appropriate technology and instructional materials are available to staff.	3.19	0.68
Resource people provide expertise and support for continuous learning.	3.67	0.48
The school facility is clean, attractive and inviting.	3.62	0.50
The proximity of grade level and department personnel allows for ease in collaborating with colleagues.	3.52	0.51
Communication systems promote a flow of information among staff members.	3.43	0.75
Communication systems promote a flow of information across the entire school community including central office personnel, parents, and community members.	3.43	0.75
Data are organized and made available to provide easy access to staff members.	3.29	0.72
	3.44	0.66

Legend: 4.21- 5.00 Practiced to an excellent extent; 3.41- 4.20 Practiced to a high extent; 2.61- 3.40 Practiced to a moderate extent; 1.81- 2.60 Practiced to less extent, and 1.00- 1.80 Not practiced

The national curricula encouraged schools to operate in the framework of building learning communities to assure supportive conditions for both relationship and structure. Additionally, in this context, the emphasis is on teachers' collaboration in planning and practice. Academic responsibilities must not be the sole obligation of the academic leader. Academic supervisors and teachers need to define their roles for the success of the teaching-learning process.

The findings indicate that academic leadership's visionary management plays a crucial role in realizing the department's critical organizational goals. Experts highlight that PLCs may be vulnerable when their

leaders are. In this study, teachers who are the participants observe that leadership may impact the academic community's development. Yet, striving for excellent learning outcomes may only become a reality with the collaboration, cooperation, and typical articulation of the members involved in the school community.

Conclusions

The research on PLT identified the dimensions that allowed the researchers to assess the practices manifested in the department. However, this study also reflects some common and contextual challenges from which academic leaders and teachers must learn. The PLT serves as a process from which the department must continuously derive its development mechanism. The department's PLT is finally assessed as follows:

1. A shared vision is centered on decisions that align with the school's values, and vision and school goals focus on student learning beyond test scores and grades.
2. Shared leadership focuses on decision-making through committees and communication across grade levels.
3. The structure that enabled the development of the PLT in the department was more on supportive conditions of the relationship.
4. Collective learning and application are centered on collegial relationships among staff members that reflect the commitment to school improvement efforts.
5. Shared personal practice characterizing the department was opportunities for coaching and mentoring.
6. Supportive conditions and relationships lie among staff members who support honest and respectful examination of data to enhance teacher and learning.
7. Supportive conditions and structures focus on resource people who provide expertise and support for continuous learning.

Recommendations

The following recommendations are advanced:

1. No such thing as too little time for successful academic leadership exists. Shared leadership can vary, but the end goal is the same. Academic leaders must be flexible with whatever shared experiences to fill in the gap between theory and practice in the context of PLCs or PLTs. The Academic Supervisor needs to provide teachers more opportunities to initiate change, critically analyze students' work as a team, observe peers in the classroom, provide feedback on instructional practices, and access key information.
2. Leadership grounded on communication, openness, collaboration, and sharing must be the culture to be maintained in the practice of PLTs.
3. Teachers in the academic community must continuously be open to constructive criticisms in the face of changes and challenges. They are the secret to success in the implementation of PLTs.
4. The department should hasten supportive conditions on relationships and structure to foster collaboration in leadership. Constant feedback, self-reflection, and shared learning practices should be encouraged and nurtured in the academic community.
5. Further studies on PLCs and PLTS in other settings may provide insights into how other academic institutions experience and exercise PLCs and PLTs and thus learn from them.

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Teachers' Psychological Factors and Teachers' Work Motivation During Movement Control Order (MCO)

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ABSTRACT

The Movement Control Order (MCO) has been implemented in the country to curb the spread of the Covid-19 pandemic. The country's social sector including education, has been affected by the MCO. This situation has affected various parties including school teachers. A survey study was conducted to examined the relationship between teachers' psychological factors in terms of stress, anxiety and depression with the work motivation of high-school teachers during the implementation of MCO. This study involved 595 high-school teachers who were selected through convenient sampling. The survey questionnaire, which was distributed and answered online in a google form, contained 43 items consists of some demographic information on high-school teachers, stress, anxiety, depression and work motivation constructs. Descriptive analysis was used to determine the psychology factors and work motivation, while inferential analysis was used to determine the relationship for each variable. The findings of the study found that school teachers experienced moderate levels of stress, anxiety, depression and work motivation during the implementation of the MCO. At the same time, the relationship between stress, anxiety and depression and school teachers' work motivation during MCO was weak and negatively correlated. Hence, this study suggests that teachers need to identify the causes of stress, anxiety and depression they experience in order to evaluate appropriate strategies and contribute more productive ways in conduct e-teaching. In addition, this study can also help certain parties, especially the Ministry of Education to understand teacher's stress, anxiety, depression and motivation levels during the MCO.

Keywords: Movement Control Order (MCO), teachers, e-teaching, psychological factors, work motivation

Introduction

The world was shocked by the 'coronavirus' pandemic that occurred globally and continuously from late 2019 and early 2020. Since the 2019 coronavirus pandemic, now known as Covid-19, the entire world has been affected. The epidemic was first identified in Wuhan City, Hubei, China in mid-December 2019, and it originated from a novel coronavirus, known as Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), (Li, Liu, Yu, Tang, & Tang, 2020). According to Worldometes, 2020, Covid-19 has infected millions of people and hundreds of thousands have died due to Covid-19, in addition Covid-19 has spread rapidly to other countries such as Italy, United States of America, Spain, Japan, Korea, eventually to Malaysia. Therefore, the Malaysian government has decided to implement the MCO from 16 March 2020 to 28 April 2020 in order to curb the spread of the Covid-19 pandemic (Official Website of Prime Minister Office, 2020). The implementation of the MCO has also affected many industries, including education, as schools across Malaysia had to be closed while the school sessions were surpassingly scheduled to start on 23 March 2020. With the implementation of the MCO, teachers have to work from home in order to continue teaching despite school closures. This has happened in the Public Service Department- *Jabatan Perkhidmatan Awam* (JPA) has announced a circular to all government civil servants and employees to work from home as government premises obliged to be closed on 17 March 2020 until further notice. Similarly, the Ministry of Education Malaysia has also taken action by issuing a circular reference number KPM.100-1/3/2 (92) on 27 March 2020 on the relevant guidelines and Standard Operating Procedure (SOP) of implement teaching and learning during MCO due to the spread of COVID-19. This circular provides comprehensive guidelines for all teachers to implement home teaching and learning. It also clearly explains the roles and responsibilities of all parties including school administrators, parents and teachers during the MCO.

Therefore, this study was conducted to look at the psychological factors of teachers from the perspectives of stress, anxiety and depression that are said to affect teachers' work motivation (Wong, Sulaiman, Ibrahim, Mohd Abdul Gaffar, Hassan & Jaafar, 2021). According to Agnes Chigona (2014) motivation is considered as the driving force that helps each individual succeed in tasks, careers and life aspirations. In this study, teacher work motivation refers to pandemic pedagogical readiness in transforming traditional teaching to electronic teaching (e-teaching) involving digital and computational systems that communicate with students rather than face to face on the teaching and learning process. This study focuses on factors of stress, anxiety and depression as well as teacher work motivation during the MCO e-teaching period, at the same time this study also examines the extent to which these psychological factors contribute to teacher work motivation.

Nevertheless, pandemic pedagogy, distance teaching and e-teaching have emerged on the national education agenda to address the difficulties teachers face in implementing planned teaching sessions during the school's closure since the start of the MCO. Pandemic pedagogy has been done through e-teaching with various of webinar applications involved such as ZOOM, Google Hangouts meet, VOOV and etc., these webinar applications at present has become an important tool for this pandemic pedagogy (Zhou, Li, Wu & Zhou, 2020). Although e-teaching applications have helped to continue teaching sessions during school closures, but e-teaching has posed difficulties to teachers in this new adaptation from face to face to faceless computer screen, marking from pen become cursor marker, this situation creates stress among teachers. Moreover, during the MCO period, teachers are required to maintain social distancing from neighbors, friends and family members and have limited mobility due to distancing restrictions. Thus, although e-teaching helps education, but unforeseen circumstances causes by Covid-19 and distancing restrictions can cause individuals, including teachers, to thinks too much, and excessive worry about unforeseen circumstance can cause excessive stress, anxiety and depression (Jadhav, 2020).

Furthermore, the impact of stress, anxiety and depression on a teachers during the Covid-19 pandemic will affect his/her motivation in teaching during the pandemic pedagogy. The restricting social distancing sometimes leave teachers unable to seek help when faced with e-teaching problems. For example, e-teaching preparation differs from classroom teaching preparation, where in e-teaching it may take longer to prepare due to extraneous factors that slow down the teaching process, such as internet instability and teachers' difficulty in getting student attendance through e-teaching. Therefore, for the purpose of this study, several objectives of the following study have been formed.

Research Objectives

This paper aims to examine the relationships between teacher's psychological factors and work motivation during the Movement Control Order (MCO) in Covid-19, therefore the objectives of the current study are (i) Determining the relationship between stress and teachers' work motivation during MCO, (ii) Determining the relationship between anxiety and teachers' work motivation during MCO, and (iii) Determining the relationship between depression and teachers' work motivation during MCO.

LITERATURE REVIEW

Previous studies such as the study of Ferguson, Frost and Hall (2012) have shown that there is a relationship between stress, anxiety and depression among teachers with job satisfaction that leads to teachers work motivation, as well as mentioned by Evonne and Crispina's, (2017), have shown there is a relationship between school climate and teachers' work motivation. Findings of the study show that stress arises from workload, student attitudes, school leadership as well as administration. Past studies have looked at many factors that cause teachers stress from various factors such as the study of Siva Rabindarang & Khuan Wai Bing (2012) who looked at aspects of leadership in organizations. Ooi Chew Hong & Aziah Ismail (2017) and Zawanah (2015) discussed student misconduct, workload, time and resource constraints, interpersonal relationships and appreciation are also among the factors that contribute to stress among teachers.

Moreover, according to Umi Kalsom, (2014), stated that the main causes of teachers work stress is the factors of time management, motivation and student discipline. These factors to work-related stress faced by teachers cause mental and emotional disruptive, thus, teachers need to have strategies in dealing with stress in order to avoid deterioration of teacher work performance which is greatly influenced by time management factors, motivation, discipline as well as authority in the profession. Based on this previous study, teacher stress during this period of MCO should also needs to be studied to see its relationship with teachers' work motivation. Additionally, as stated by Lia Inda & Ruslin, (2018) work stress among teachers can be avoided if teachers have high job satisfaction. Teachers who are always calm and positive will give the best work results compared to teachers who are easily depressed and always think negatively due to dissatisfaction in various aspects. This is in line with that teachers' motivation and work stress have a highly negative correlation (Anis Salwa & Siti Noor, 2018).

Nevertheless, the findings of Talirkodi's (2016) have shown that teachers are more motivated when conducting teaching and learning using Information and Communications Technology (ICT) and teachers' work motivation increases when they teach using ICT tool, but the findings of this study focus more on use of ICT during teaching face-to-face in the classroom. In the same study, the findings of the study also discuss challenges to teachers in teaching applications with ICT tools, such as lack of time, lack of ICT facilities and technical support in schools, insufficient ICT skills and poor internet connection to support ICT during teaching, eventually challenges and incompetence becomes factors that drives the motivation. Other factors that contribute to work motivation are also discussed in Nurjannah & Abdul Said (2018), a positive school climate that helps to increase job satisfaction among

the teachers. This includes the internal and external climate of the school in order to promote teaching professional development of teachers. In contrast, from the point of view of employee as a teacher, the multi-skill factor is the knowledge and skills required to perform work that demands work stress, emotional, mental and physical demands (Humphrey, Nahrgang & Morgeson, 2007). The findings of the studies of Nazila and Seyed (2014), Mohammad Hadi (2013) and Isfahani, Bahrami and Torki (2013) have shown a relationship between various knowledge factors with teachers work motivation. In short, teachers' work motivation is interesting to study during this MCO period.

METHODOLOGY

This study uses quantitative approach with cross-sectional study method to achieve its objectives. According to Noraini Idris (2010), cross-sectional studies are used to collect information from a predetermined population sample, at a particular point in time. Questionnaires of teachers' psychological factors measuring stress, anxiety, depression and work motivation during MCO were distributed to school teachers through a convenient sampling method. The target population of the current study is high-school teachers teaching in Selangor district, Malaysia with experiences in conducting online classes during the MCO and therefore, a google form questionnaire was distributed and answered by these high-school teachers, thus a total of 595 questionnaires were received in a good condition. The questionnaire applied in the current study that measures the psychological factors of teachers and current work motivation of MCO was developed by the researchers. This instrument went through a validation process, ethnic approval application and pilot study before being distributed in the actual study. This instrument consists of four parts, namely part A is demographic information, part B is the stress construct, part C is the anxiety construct and part D is the depression construct and part E is the work motivation. Sections B, C, D and E use a 5 -point Likert scale that is a value of 1 (strongly disagree) to a value of 5 (strongly agree).

The instrument applied in the current study is originally in Malay Language, hence, to ensure the content validation the instrument has been sent to three (3) native Malay Language to re-ensure the translated content is valid and the translated instrument will be tested through pilot test for running reliability purposes. Moreover, the reliability of this instrument has shown good Cronbach's alpha values with (0.812), (0.892), (0.644) and (0.957) for stress construct anxiety construct, depression construct, and work motivation construct respectively. Table 1 shows the value of the correlation coefficient. Prior to the actual study, the pilot study was conducted and the result showed that the values of Cronbach's alpha coefficient for each construct were; stress (0.906), anxiety (0.920), depression (0.845), consumption (0.813), monitoring (0.856), evaluation (0.891) and motivation (0.957) respectively, each with a high reliability value. This suggests the variables have good items and can be used in real studies (Lim, 2007). This study uses SPSS for descriptive analysis and inferential analysis.

Table 1: Correlation coefficient table

***r* value**	**Correlation**
.86 – 1.00	Very Strong
.70 – .85	Strong
.51 – .69	Average
.20 – .49	Weak
.00 – .19	Very Weak

Source: Ary, Jacobs & Razavieh (1996)

FINDINGS

Descriptive analysis through SPSS found that the mean for stress, anxiety, depression and work motivation was moderate. Table 2 shows the levels of teachers' psychological factors of stress, anxiety, depression and work motivation.

Table 2: Level of stress, anxiety, depression and work motivation Table

Mean Score	Level	Stress Mean	Anxiety Mean	Depression Mean	Work Motivation Mean
1.00 – 2.33	Low				
2.34 – 3.67	Moderate	2.71	2.82	2.75	3.35
3.68 – 5.00	High				

Table 3 shows that there is a significant negative relationship between stress, anxiety and depression with work motivation among teachers. In fact, the negative relationship shown in stress and anxiety with work motivation is weak, while depression and work motivation show a very weak relationship based on correlation coefficient values table by Ary, Jacobs & Razavich (1996). This can be seen through the relationship of stress with motivation ($r = 0.223$, $p < 0.01$), anxiety with motivation ($r = 0.211$, $p < 0.01$) and depression with motivation ($r = 0.092$, $p < 0.01$).

Overall, the results based on Pearson correlation analysis can be concluded that the stress, anxiety and depression with work motivation have negative and weak relationship among teachers. The results of the analysis also clearly show that among the three psychological factors, the factor of stress showed the highest relationship with work motivation among high-school teachers at the time of the implementation of pandemic pedagogy during the MCO. The relationship for each variable can be seen in table four below.

Table 3: Relationship between stress, anxiety and depression and work motivation.

		stress_FRcd	anxiety_FRcd	depression_FRcd	workmotivation_FRcd
stress_FRcd	*Pearson Correlation*	1	.754**	.627**	-.223**
	Sig. (2-tailed)		.000	.000	.000
	N	595	595	595	595
anxiety_FRcd	*Pearson Correlation*	.754**	1	.687**	-.211**
	Sig. (2-tailed)	.000		.000	.000
	N	595	595	595	595
depression_FRcd	*Pearson Correlation*	.627**	.687**	1	-.092*
	Sig. (2-tailed)	.000	.000		.025
	N	595	595	595	595
workmotivation_FRcd	*Pearson Correlation*	-.223**	-.211**	-.092*	1
	Sig. (2-tailed)	.000	.000	.025	
	N	595	595	595	595
** *Correlation is significant at the 0.01 level (2-tailed).*					
* *Correlation is significant at the 0.05 level (2-tailed).*					

DISCUSSION

The analysis showed that the level of stress, anxiety, depression and work motivation of teachers were at a moderate level. This situation shows that teachers are able to control their stress and do not experience severe anxiety and depression during the implementation of pandemic pedagogy at the time of MCO.

The findings have shown that the highest mean of stress-related items is "teachers feel a lot of barriers." These barrier is understandable because the restriction of social distance unable attend school as well as they are also obliged to stay at home and were not allow to move even to the other places and their movement was limited and many things could not be done. As for the anxiety item, the item "I am worried that something will happen to myself or my family" showed the highest mean value of 3.77. Given the unexpected situation based on the increase in the number of covid-19 positive cases reported, causing them to feel insecure and anxious about the situation. As for depression, the item "I always think positively about what happened" showed the highest mean of 4.01, this is a reverse item that shows teachers do not suffer from depression. Teachers are able to remain positive about everything that happens. In terms of work motivation, the highest mean is on the item "teaching by e-teaching has developed my profession as an educator", this is an optimistic viewpoint from teachers in notifying us that they are ready to transform traditional teaching to electronic teaching (e-teaching) and they belief e-teaching is developing their skills to become a professional educator.

The analysis found that the relationship between stress, anxiety and depression with work motivation was weak at the time of MCO period. Even though the situation is different and it could be said that it is a situation that has never been experienced by the public before, but teachers are required to continue teaching sessions fully digitally without seeing their students face-to-face. This is in line with previous studies that stated that teacher motivation is related to the school climate and also environment factors. As mentioned by Evonne and Crispina's, (2017), indicates that there is a weak positive relationship between school climate and teachers' work motivation. In the context of current study among other factors that can be associated with work motivation it is said that multi-skill factors have a significant direct relationship with work motivation (Nazila & Seyed, 2014; Mohammad Hadi, 2013; Isfahani, Bahrami & Torki, 2013). This factor is seen to be highly relevant to the factors associated with the work motivation of high-school teacher during the MCO period. Among the multi-skills that teachers need to acquires are skills in using digital learning and technology tools as well as online-based teaching materials.

Additionally, the findings of the study also show that stress has a high correlation with work motivation compared to factors of anxiety and depression. This is in agreement with Ooi Chew Hong & Aziah Ismail (2017) and Zawanah (2015) discussing workload, time and resource constraints, interpersonal relationships. During MCO, the stress experienced by teachers where they feel uncomfortable to perform daily activities when they are not allowed to go out or to school. They also felt many constraints that they had to face during this MCO and stress also arose when they found it difficult to concentrate on something that needed to allocate time for family as well as duties as a teacher at home. There are also teachers who are stranded in their villages after returning from holiday but are not allowed to return to their homes. Indirectly, this situation invites pressure on these teachers.

CONCLUSION

Overall, this study has shown that the levels of stress, anxiety, depression and work motivation of teachers during MCO are at moderate levels. Even though the case of Covid-19 is at an elevate level but it could be concluded that teachers are said to be less stressed as the implementation of e-teaching

makes teaching sessions seen as under control, anxiety and depression are less correlated from stress among teachers. The motivation of teachers to implement digital teaching and e-teaching is also at a moderate level and even teachers are not yet fully prepared in implementing e-teaching.

However, the findings of the study indicate that stress, anxiety and depression had no very significant association on work motivation of high-school teachers during the implementation of MCO in the Covid-19 pandemic. Therefore, studies related to other factors should also be seen to help teachers increase their work motivation. Although the level of stress, anxiety and depression of teachers is at a moderate level, certain parties as education stakeholder such as Ministry of Education, States Education Departments and District Education Offices nationwide need to look at this situation to help teachers so that their stress, anxiety and depression could remain on an optimistic level. Hence, this study suggests that teachers need to identify the causes of stress, anxiety and depression they experience in order to evaluate appropriate strategies and contribute to a more productive way of conducting e-teaching.

In addition, this study recommends various parties such as school administrations and ministries to provide social support and encouragement to teachers as well as encourage teachers to adopt a healthy lifestyle to reduce stress, anxiety and depression to help them increase work motivation. Other factors that influence teachers' work motivation are such as the readiness of teachers in terms of knowledge and skills to use digital teaching, the readiness of parents and students as well as technological facilities are proposed to be given close attention. This study can also help certain parties, especially the Ministry of Education to see how the motivation of teachers can be improved during the MCO.

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Conducting Research: Experiences, Challenges, and Benefits towards Institutional Development Activities in the Private Maritime University, Philippines

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ABSTRACT

The study determined the different experiences, challenges, and benefits of institutional development programs in the private maritime university in the Philippines. The qualitative method was employed in this study to capture the qualitative results of the marine officers who want to become "marine researchers" towards institutional activities which would enhance their research capability. The respondents were the ten (10) marine engineers who were teaching professional subjects for quite a several years. The results highlighted that the experiences, challenges, and benefits of conducting research among marine engineers contributed to the development of institutional activities such as the following: research capability seminar-workshops, attendance at national, and international research conferences, and "research-mentoring with senior researchers" in the private maritime university in the Philippines.

Keywords: Institutional Research, Experiences, Challenges, Activities, and Maritime University

Introduction

Research is a tool for excellence in higher education institutions as claimed by educators, academicians, and professors. It also leads to the attainment of global competitiveness in education. It further aims to develop the knowledge, skills, and character of individuals, which is similar to the aim of educating them. Education and research have similar purposes and functions. The purposes are the fundamental goals of the processes – an end to be achieved, while functions are the outcomes that may occur as a natural result of the process – products or consequences. To achieve the goal of a university, both research and education play important roles (Alimen & Salvadia, 2015).

Meanwhile, research is the defining characteristic that differentiates a higher education institution from a basic education institution. Knowledge creation is the primary mandate of higher education to propel national development through a cadre of professionals imbued with new knowledge, skills, and attitudes that will make them global Filipinos (Japos, Tumapon, & Lozano, 2010)

Moreover, the seafaring profession has always involved a different way of life. It is a diverse activity in which the absence of family and friends and the inability to take part in activities available to other people have to be accepted. At different periods in history, the profession has been regarded in different ways. In ancient times seafaring meant involvement in commercial activities; at the time of the discoveries seafarers were at the forefront of progress, and today it is still a profession that can provide a better way of life for families, especially for the sons and daughters of seafarers from developing countries. Seafaring has always been a dangerous activity and many seafarers have lost their lives while making their contribution to the world economy. Consequently, it should be an occupation where safety is of paramount importance (Veiga, 2005; Alimen, 2010).In this same source, (Veiga, 2005; Alimen, 2010) the study highlights salient points regarding the seafaring industry, particularly on the work of seafarers, which will be a vast reservoir of research.

Meanwhile, there is a consensus in the education research community today on the need to increase seafarers' capacity to conduct research not only on educational problems but on other related areas of research. In this light, marine officers, who opted to change their careers, become involved in the world of research to enrich themselves and help them in their professional development.

Statement of the Problem

The study presented the different experiences, challenges, and benefits of marine engineering officers towards institutional development activities to enhance the research capability of marine engineers in the private maritime university in the Philippines.

To further understand the present study, the specific questions were advanced:

1. What were the experiences of the marine officers before and after they become maritime researchers?

2. What challenges do these marine officers encounter in the process of conducting research?

3. What benefits were pointed out by these researchers in the process of conducting research?

4. What are the institutional development activities needed by marine officers to enhance their research capabilities?

Conceptual Framework

The concept of this study was presented in Figure 1. It shows in the figure that the research experiences, challenges, benefits, and suggested activities were influenced by the development of the research capability of the marine officers.

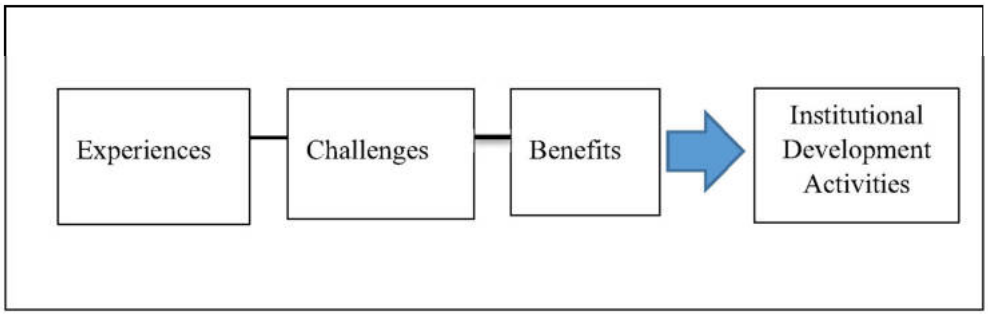

Figure 1: The research paradigm of the present study

Theoretical Framework

The researchers of the present study employed "framing" as the theoretical framework based on the study of Alimen (2010). This theory discusses the salient features of the respondents using qualitative data and information through oral and written texts from the period where the respondents were on board (marine engineers/officers) to the time they were accepted into the private maritime university in the Philippines.

Furthermore, Gamson (1989, in Alimen, 2010) defines that "a frame is a central organizing idea for making sense of relevant events and suggesting what is at issue." Entman (1993, in Alimen, 2010) explained that framing, "is to select some aspects of a perceived reality and make them more salient in a communication text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described." Entman (1993) and (Charmaz, 2000) pointed out that framing in the news bears "an imprint of power" of "the actors or interests that competed to dominate the text." Multiple qualitative research methods were used in this study. The interviews and testimonies were analyzed using the categorization process.

Method

The framing approach to research focuses on the different perspectives that researchers from different backgrounds use to make sense of the issues they want to research jointly. Based on interviews, respondents' evaluations, and the researcher's conversations meetings, five aspects of frame diversity are analyzed in this research project. First, the experiences as a researcher of the respondents were pointed out. Second, the researchers looked into the challenges researchers perceived by the respondents. Third, benefits derived from the experience of writing were looked into. Fourth, analysis of the difficulties encountered. Fifth, institutional development activities are needed by the respondents to enhance their research capability. The researchers likewise contend that the diversity of frames or perspectives that the respondents possess makes sense of the issues of importance in this specific research context. In this paper, the framing approach was particularly used to make sense of the texts, both oral and written.

Respondents of the Study

The respondents of this study were the ten (10) marine engineers who were teaching professional subjects at the private maritime university (John B. Lacson Maritime University-Molo as the only private maritime university in the country) in the Philippines for quite a several years.

Results and Discussions

Ten (10) marine engineering officers were utilized as respondents to this investigation. The marine officers are coded as O_1 to O_{10} for discussion. Neil Ellis of the Seafarers International Research Centre shed some light on the role of maritime researchers at SIRC's website: www.sirc.cf.ac.uk . He emphasized that marine officers are encouraged to formally take part in research studies that take place in their sector, no matter who conducts them. It is only by actually taking part that their voices can be heard, and to think that they have some very valuable contributions to make to the range of debates in which maritime sector members engage. Based on the data generated for this purpose, the researchers decided to tackle the experiences, challenges, and benefits of the marine officers towards the institutional development of the private maritime university in the Philippines.

A. Experiences of the Marine Officers as Researchers in the Private Maritime University in the Philippines

Table 1 contains the experiences of the marine officers in conducting research.

Table 1: Experiences of the Marine Officers as Researchers in the Private Maritime University in the Philippines

Respondent	Experiences
Officer 1 (O_1)	Process of interviewing and document analyzing. I interviewed welders and technical workers at Subic Shipyard and I enjoyed gathering information on shipbuilding and repair.
Officer 2 (O_2)	Monitoring seagrass by identifying the type of seagrasses and other dominant species in the area, measuring the height of the grasses in every quadrat, getting pictures, biomass, specimens for laboratory testing, and measuring sea grass' density.
Officer 3 (O_3)	Exchanging my ideas on issues, concerns, and trends in education, maritime regulations in research, and other environmental concerns.
Officer 4 (O_4)	Dealing with scientific procedures in the discovery of new knowledge. Application of the different steps in conducting research, both quantitative and qualitative.
Officer 5 (O_5)	Enhancement of my skills and knowledge in understanding the research process and determination of scientific data needed in the research activity.
Officer 6 (O_6)	Proper identification of the research problem specifically dealing with maritime education and training. I learned the skills of interviewing and other rudiments of conducting tracer studies.

Officer 7 (O_7)	Exposure to the world of research has contributed to me both as a teacher and at the same time a marine officer. My new knowledge in science and technology has been translated into more valuable output.
Officer 8 (O_8)	Conduct and experience research despite my limited background and exposure to it. I learned the art of technology like internet surfing and finding related data that are useful in my inquiry.
Officer 9 (O_9)	Determining the adversity quotient is a big experience for me brought about by research aside from the systematic process done in research.
Officer 10 (O_{10})	Done work on the competitiveness of seafarers on board international vessels through research. Attendance at research fora and participation in research-related activities has enhanced my research skills.

B. Challenges of the Marine Officers in Conducting Research

Table 2 contains the challenges considered by the respondents in conducting research in the private maritime university in the Philippines.

Table 2: Challenges of the Marine Officers in Conducting Research

Respondent	Challenges
O_1	Conducting research based on the desired research design and requisites.
O_2	My level of awareness of natural sciences and specifically research environment and other marine-related topics.
O_3	Translating research activities based on the University's mission-vision statements
O_4	Scientific procedure in the discovery of new knowledge and translating this to research to validate such knowledge
O_5	Showing the interrelationships among the variables used in the research
O_6	Formulation of research problems and issues related to maritime education and training
O_7	Searching for new and exciting knowledge in the field of science and technology
O_8	Determining scientific data regarding different issues and matters related to my teaching as a marine engineer.
O_9	Actual exposure to the research area like sea grass monitoring
O_{10}	Relating my career as marine officer and the research work I do.

C. Benefits Derived in Conducting Research Activities

The following benefits obtained in conducting research are taken from the marine officers in the private maritime university in the Philippines.

Table 3: Benefits Derived in Conducting Research Activities

Respondent	Benefits
O_1	Research had widened my professional career and made me a well-rounded instructor.
O_2	I have a chance to share the knowledge I gained with my students like looking at the beauty of nature. Knowledge gained by the students on oils, lubricants, and pollutants will be countered and checked by the inputs of knowledge on how nature can be taken care of like seagrass, corals, mangroves, and fish.
O_3	Research has sharpened my knowledge of maritime affairs, issues, concerns, and trends in education.
O_4	Research has prompted me to read and review my knowledge. I have improved professionally through graduate research paper requirements.
O_5	Research has improved my technical knowledge and encouraged me to study more to improve my knowledge specifically in scientific investigations.
O_6	I have learned by heart the rudiments of conducting research.
O_7	Exposure, participation, and involvement in research possible have been because of my research interest.
O_8	Research has helped me find solutions to simple problems and helped me in my profession. I was as well helped in my teaching career.
O_9	I had learned and understood my students well.
O_{10}	My knowledge was enhanced specifically in determining materials needed for my teaching profession and professional development.

The results of this study highlighted that the experiences, challenges, and benefits of conducting research among marine engineers contributed to the institutional development and attainment of a private maritime university in the Philippines in delivering maritime education. From the experiences related by marine engineers, research in the private maritime university lead to new insights towards addressing demands in officers and problems in the employment of global-seafaring labor. Aside from that, their experiences become meaningful documents from which maritime realities can be derived and institutional development activities can be drawn.

Implication of Institutional Development Activities of Marine Officers

The figure below shows the institutional development activities needed by the marine officers to improve their research capability.

The research capability-building seminars or workshops were considered one of the institutional development activities of the maritime university in the Philippines. These activities suggested by the marine engineers towards research skills and knowledge will be developed and enhanced. Invited speakers will usher them into the research process and enkindle their curiosity to discover and explore some areas in maritime education, which draw their interests and concerns.

The second institutional development is the suggestion that the "marine officers shall be sent to national and international research conferences." This activity may help them to understand further the importance and implications of studies in their respective fields of specialization. Moreover, attending research conferences or seminars may lead them to the reality that "research is fun" instead of thinking that "research is a difficult activity" as a college instructor.

The third proposed institutional activity is to "have to mentor with senior researchers in the university" because they believe that "no man is an island," therefore, learning with their senior research-fellows or co-teachers would be a great help to improve their research skills and knowledge and drive them more to participate and be part of the third function as university-professors -- to conduct research and share the findings with the relevant communities for utilization and usability.

Conclusion

In conclusion, the experiences and challenges in conducting research of the marine engineers in JBLFMU-Molo were categorized and highlighted in this study. These were used by the researcher to underscore the transformation that occurred in the life of marine officers to become “researchers” at the maritime university (JBLFMU-Molo).

The difficulties and issues shared by the respondents were captured in this study and used as one of the bases for describing the transformation from "marine officers" to "researchers" in the maritime university. These lead the participants in encouraging them to present studies in national and international fora, conferences, and symposia. Attributes and benefits from sharing through written and oral documents were unveiled by the process used in this study. Framing theory was utilized to capture the focal point of the study and arrive at the objective of demonstrating the "transformation" that took place in every encounter and experience of seafarers leading to embrace the trademark of becoming "researchers" in the university.

Furthermore, the respondents agreed that they need the following: research capability-building seminars or workshops, attending national and international research conferences, and mentoring with senior researchers in the university. These elements are very crucial in developing the respondents' research skills and knowledge to further address the problems in maritime education and training (MET) through conducting scientific processes or research.

Recommendations

Based on the findings of the present study, the following recommendations are advanced by the researcher:

(1) The administration of JBLFMU-Molo shall sustain the skills, enthusiasm, and drive of the "marine officers" towards the conduct of research to achieve global competence in maritime education through in-house training and seminars.

(2) Continuous training and exposure of these marine engineers in research and related activities here in the country and abroad provided to prepare them to become competent "researchers" are highly recommended.

(3) Experiences, challenges, and issues shared by the respondents of this study shall be noted by the Research Department in re-channeling them to become full-fledged "maritime researchers" to achieve the agenda of maritime universities toward global education competence.

(4) Parallel studies shall be conducted by those interested in qualitative studies to further determine other factors that may contribute to the improvement of the research capability of the marine officer.

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Guidelines for Development of Graduate Curriculum in Early Childhood Education Management

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ABSTRACT

This research was necessary as a Postgraduate Programme in Early Childhood Education Management (ECEM) is expected to address the development of preschool teachers following the educational requirements given by the Office of Higher Education Commission. The research aimed 1) to explore needs and ideas to support the Postgraduate Programme in ECEM and 2) to provide guidelines to improve the Postgraduate Programme in ECEM. The research participants totalled 455 volunteers in Bangkok, Thailand. They came from different groups of stakeholders in early childhood education, namely, pre-service teachers, graduate students, preschool teachers, headmasters, and university lecturers. In the quantitative phase, the participants were invited to answer an ECEM questionnaire to give a general picture of ideas and expectations to advocate learning about ECEM. In the qualitative phase, two participants from each group in the first phase, a total of ten participants were invited to share ideas within a focus group discussion. After undertaking the questionnaire and the focus group discussion, quantitative and qualitative research data were examined and interpreted in the phase of data interpretation. The findings showed that ECEM courses should be offered according to preschool teachers' requirements and preferences such as reasonable tuition fees, location, appropriate schedules, and the duration of teaching sessions. The pedagogical preparation of ECEM courses for preschool teachers should have a variety of teaching methods, especially blended learning combining the in-person teaching approach and learning online. Additionally, ECEM postgraduate students were expected to be able to apply new knowledge, research experience and pedagogical skills in their workplace. To provide a broader picture of the development of the Postgraduate Programme in ECEM, recommendations were made regarding the practical application of pedagogical management and research skills in the classroom. The research could be further explored regarding the ideas and expectations of other groups, such as the parents of preschool children, psychologists and paediatricians.

Keyword: Guidelines for Development, Early Childhood Education Management (ECEM)

Introduction

Preschool teachers play a vital role in offering fundamental knowledge and skills to preschool children in the early part of their learning experience (Ministry of Education, 2017). However, preschool teachers in Thailand often face challenges regarding teaching preparation, pedagogical management, and the practical application of research skills in the classroom (Woolfolk, 2018). Following the preparation for teaching and learning, the teachers were confused about using new teaching materials and technology. Additionally, the teachers lacked the inclination to update and upgrade their understanding of theoretical teaching knowledge and innovation for preschool children (Wiles et al., 2011). Due to these issues, the drawbacks of teaching and learning in the classroom need to be considered. In addition, the development of pedagogical knowledge and competencies should be offered to enhance the preschool teachers' teaching preparations and responsibilities (Boyle et al., 2003). Studying in a Postgraduate Programme in Early Childhood Education Management (ECEM) is an opportunity to improve the teachers' teaching knowledge, abilities and skills. In response to these teaching and learning expectations, the research aims 1) to explore the needs and ideas to support the Postgraduate Programme in ECEM and 2) to provide guidelines to develop the Postgraduate Programme in ECEM. In an attempt to understand a general picture of early childhood education, most studies concentrate on the relationship between teaching and learning styles in the classroom, using educational innovation and digital technology for preschool children, improving the understanding of educational psychology for the parents of preschool children, and the awareness of selecting and using social media for preschool children (Jacobs, 2010). However, previous research publications have not included much material concerning the development of a postgraduate programme in early childhood education. This presents a gap in this area of research. Ideas given by different groups of participants in the research involved with early childhood education could provide further perspectives and suggestions to develop the Postgraduate Programme in ECEM.

Literature

To provide a clear understanding of early childhood education in Thailand, the subject is considered in two sub-sections. Expectations and motivation to be a preschool teacher are discussed in sub-section 1, while the question of 'Why do we need to develop the Postgraduate programme in ECEM?' is addressed and justified in sub-section 2. Explanations are shown in the following sub-sections.

1. Expectations and motivation to be a preschool teacher

Pre-service and in-service teachers in Thailand were expected to be preschool teachers because they felt happy to provide knowledge, skills, care and support to preschool children. They enjoyed making students enthusiastic and interested in creative learning activities (Woolfolk, 2018). Additionally, preschool teachers have the right to receive welfare benefits and pensions offered by the Thai government. Although these top reasons were considered, preschool teachers still encountered challenges regarding further expectations of the parents of preschool children and school policy (Oliva et al., 2013). In a school, the teachers must prepare a lot of paperwork and assessment records for teaching in the classroom. This was an unwarranted burden over and above their major teaching responsibilities (Eggen & Kauchak, 2016). Moreover, the teachers were expected by the parents of preschool children to have the capabilities and skills to improve the academic knowledge of individual students, especially literacy and numerical competencies (Ministry of Education, 2017). Due to these issues, the teachers found it difficult to provide the appropriate teaching preparation and management.

This is a mismatch between the parents and the school in terms of policy and expectation and the pre-service and in-service teachers' reasons for having schoolteacher status.

2. Why do we need to develop the Postgraduate Programme in ECEM?

Although the teachers have had prior knowledge and experience since studying a Bachelor of Education (B.Ed.) Programme in Early Childhood Education, this was not enough to enable support them to provide appropriate learning activities and classroom management to preschool students (Eggen & Kauchak, 2016; Ministry of Education, 2017). Due to the rapidly changing world, preschool teachers need to continually engage in the development of pedagogical knowledge and skills. Hence, teacher training events were offered to the teachers. However, the events were limited to supporting preschool teachers' knowledge and skills because of a short training course. The teachers lacked a clear understanding of the content of the training course (Jacobs, 2010). Moreover, they had a time limit to criticise and elaborate on new knowledge from taking part in a training course. Additionally, the teachers faced the parents' and school's expectations, as mentioned in sub-section 1. Therefore, study places on the Postgraduate Programme in ECEM were offered to preschool teachers. This is an opportunity to enhance the teaching qualifications of the Master of Education (M.Ed.) programme in ECEM and learn about the trends in early childhood education with particular reference to the skills required for doing a research project, educational innovation and pedagogical management. Preschool teachers can have discussion opportunities to share ideas and teaching experiences with lecturers and experts in early childhood education. Although the programme was designed to address the expectations and requirements of preschool teachers, the programme needs to be improved following the concepts of curriculum development and the need for assessment (Eggen & Kauchak, 2016). To provide a clear picture of the improvement of Postgraduate Programme in ECEM, diverse perspectives and recommendations were required from different groups of stakeholders involved with early childhood education such as pre-service and in-service teachers, headmasters, graduate students and university lecturers (Eggen & Kauchak, 2016). By following this idea, the Postgraduate Programme in ECEM could be appropriate and beneficial for preschool teachers.

Methodology

The research methodology adopted in the research was considered for research design, research participants, research instruments, data collection and analysis. In an attempt to answer research questions, research design combines quantitative and qualitative methods and data. Creswell & Guetterman (2019) argue that the researcher can systematically and rationally design the mixed methods process to reduce weaknesses, as the findings can reasonably be integrated. Thus, the research findings were investigated through quantitative and qualitative methods that led to greater reliability (Cohen et al., 2018). The research methodology consisted of three phases: the quantitative phase, the qualitative phase and the interpretation of research findings. In the quantitative phase, the different groups of stakeholders involved with early childhood education were invited to take part in the research. The research participants totalled 455 volunteers. They comprised 292 preschool teachers, 102 pre-service teachers, 32 graduate students, 17 headmasters, and 12 university lecturers. However, these participants could not be seen as a particular population for statistical measurement. In ideal statistical analysis, samples are normally used to infer population characteristics (Cohen et al., 2018). The research sample can only be considered representative of the research population if it is truly randomised. If these participants were considered as the research population, the representativeness of a research sample

could not be shown (Cohen et al., 2018). This limitation was apparent when attempting to carry out fieldwork in different schools and universities to obtain research results (Denscombe, 2017).

All participants provided answers to a survey questionnaire which was a quantitative research instrument. The questionnaire had ten distinct question items in connection with the expectations and suggestions offered to develop the Postgraduate Programme in ECEM. After addressing the questionnaire, two research participants within each group, ten respondents in total, were randomly selected to share perspectives in a focus group discussion in the qualitative phase. To gain the diverse opinions of research participants, ten open-ended questions were employed within the face-to-face focus group discussion. The ten questions were based on the same concepts of expectations and recommendations as mentioned in the questionnaire.

To confirm that research instruments were suitable for data collection, the instruments were piloted with three lecturers, eight preschool teachers and sixteen pre-service teachers in early childhood education at Capital City University (pseudonym) in Bangkok, Thailand. These people in the pilot study were entirely volunteers. They were not the same groups of participants in the research (Robson & McCartan, 2016).

Amendments were made following comments given by experts in curriculum development and the interpretation of statistical calculation results. The questionnaire was checked for reliability using Cronbach's coefficient alpha. Its reliability was 0.89. Additionally, long questions and jargon within the questionnaire and open-ended questions were checked to remove any possible confusion (Clarke & Braun, 2017). Research ethics were approved before undertaking the pilot study, data collection and analysis. The data collection was carried out from 10th January until 4th February 2022. The research was conducted to completion in four weeks. It was kindly supported by the Faculty of Education, Capital City University, Bangkok, Thailand.

Research data were analysed and interpreted following the interpretation of the research findings phase. Quantitative research data comprised the scores. Qualitative research data were opinions resulting from the focus group discussion. The scores were examined using the Microsoft Excel programme utilising the frequency and percentage functions. Qualitative data were categorised and interpreted using a thematic analysis approach (Clarke & Braun, 2017). Regarding the combination of quantitative and qualitative research data, a triangulation technique was employed in this research to assess the integrity of the research data (Robson & McCartan, 2016). Following this data interpretation phase, quantitative and qualitative research data were compared, corroborated and interpreted by considering each element of the research data.

Results

For this section, research data are presented in two sub-sections. The quantitative research data resulting from the questionnaire were shown in sub-section 1 regarding the demographic background of the participants and the needs and expectations to develop the Postgraduate Programme in ECEM. The qualitative research data resulting from the focus group discussion were presented by way of themes and sub-themes in sub-section 2 with respect to opinions and suggestions to provide guidelines for the improvement of the Postgraduate Programme in ECEM.

1. Needs and expectations to develop the Postgraduate Programme in ECEM: the quantitative research data

Table 1: Demographic background of the respondents (N=455)

Respondents (455)		**Frequency**	**Percentage**
Preschool teachers		292	64.18
Other groups of stakeholders in early childhood education (pre-service teachers, graduate students, headmasters and lecturers)		163	35.82
work experience	less than 3 years	118	25.93
	3 - 5 years	147	32.31
	more than 5 years	190	41.76
age	less than 30 years	117	25.71
	30 - 35 years	118	25.93
	36 - 40 years	132	29.01
	more than 40 years	88	19.34

As shown in Table 1, the demographic background of the participants showed that 292 preschool teachers were the majority group of the respondents (64.18 per cent). Other groups of stakeholders in early childhood education comprised the 163 participants (35.82 per cent). They were different groups which consisted of pre-service teachers, graduate students, headmasters, and lecturers. Considering the characteristics of the participants regarding work experience and age, the finding showed that most participants (41.76 per cent) had work experience over 5 years. They were between 36-40 years old (29.01 per cent).

Table 2: Needs and expectations to develop the Postgraduate Programme in ECEM (N=455)

Needs and expectations to develop the Postgraduate Programme in ECEM	Frequency	Percentage
1 Needs to studying the Postgraduate programme in ECEM		
be interested	336	73.80
disinterested	119	26.20
2 A short-term training course which can be compared to transfer for further study in the Postgraduate Programme in ECEM		
be interested	323	71.00
disinterested	132	29.00
3 Convenient time to study		

Monday-Friday 8.30-16.30 regular semester of the university	45	9.90
Monday-Friday 17.00-20.00	58	12.70
Saturday-Sunday 8.00-17.00	217	47.70
Monday-Friday 8.30-16.30 during the school semester break	135	29.70
4 Reasons for studying in the Postgraduate Programme in ECEM		
Development work	265	58.20
Knowledge development	190	41.80
5 Programme of study		
Dissertation only	48	10.50
Applying in courses and doing dissertation	407	89.50
6 Instructional systems		
On-site	230	50.50
Online	108	23.70
Hybrid learning	117	25.70
7 Qualifications of lecturers		
Having knowledge and expertise in the field	308	67.70
Academic work	55	12.10
Ph.D. qualification	92	20.20
8 Study visit		
National study visit	307	67.50
International study visit	146	32.10
9 Entrance examination		
Interview only	275	60.40
Subjective written exam	85	18.70
Subjective written exam and interview	56	12.30
Considering teaching experience only	39	8.60
10 Tuition fees		
Flat-rate tuition fee	56	12.30
Tuition fee per a semester	267	58.70
Tuition per credit hour	132	29.00

As shown in Table 2, the findings showed that the most participants (73.80 per cent) were interested to enroll in the Postgraduate Programme in ECEM. They needed to participate in a short-term training course which can be compared to transfer for studying in the Postgraduate Programme in ECEM (71.00 per cent). Additionally, the majority group of the participants (47.70 per cent) preferred to study on Saturday and Sunday at 8.00 to 17.00 o'clock. The participants (58.20 per cent) wanted to study in the Postgraduate Programme in ECEM because they wanted to apply knowledge and experience to improve their work. Moreover, the most respondents (89.50 per cent) preferred to apply in courses and do a postgraduate dissertation. They (50.50 per cent) also preferred to learn through an on-site teaching method. Lecturers who had responsibilities for teaching in the programme were expected by the participants (67.70 per cent) to have knowledge and expertise in the field of study. The respondents (67.50 per cent) preferred to have an opportunity for a national study visit. In addition, they (60.40 per

cent) wanted to take the entrance examination through an interview. Finally, the participants (58.70 per cent) preferred to pay tuition fees per an academic semester.

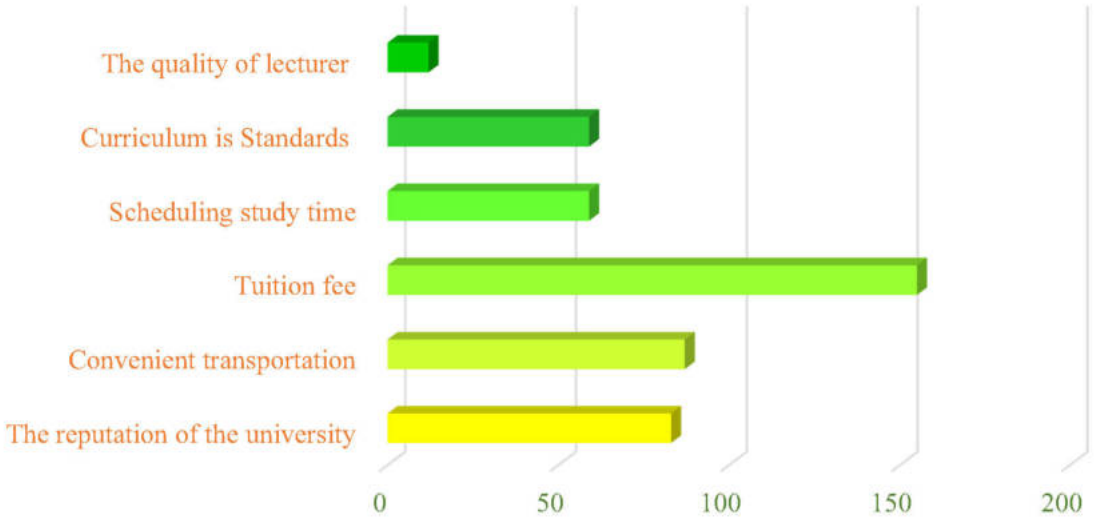

Figure 1: Reasons for making the decision to study in the Postgraduate programme in ECEM

As shown in Figure 1, top three reasons for making the decision to enroll in the Postgraduate programme in ECEM were considered in terms of tuition fees (34.07 per cent), convenient transportation (19.12 per cent), and the reputation of university (18.24 per cent).

2. Opinions for suggestions and guidelines to develop the Postgraduate Programme in ECEM: the qualitative research data

The qualitative search data resulting from the focus group discussion were presented as shown in three themes in relation to subject content, individual tutorials, and curriculum management.

Theme 1: Subject content

Within the focus group discussion, the findings showed that ideas were suggested to support teaching and learning experience with respect to preparing research practice courses for pre-service and in-service teachers in early childhood education. Regarding studying postgraduate courses at the University, pre-service and in-service teachers wanted to enroll in practice courses rather than merely listening to a lecture. Moreover, extra training events should be provided in connection with the practical application of research skills in the classroom. A male preschool teacher suggested that *'learning about educational theories regarding early childhood education was important, but it was not enough. I wanted to enroll in more practice courses which gave me specific ideas of how I should take care of preschool children and deal with student problems in the classroom'*. Another view was presented by a female preschool teacher, who recommended that *'extra training events with respect to*

arranging creative learning activities should be provided to both pre-service and in-service teachers. Additionally, a specialist in early childhood education and/or a pediatrician should be invited to share experience and train us [the pre-service teachers] for developing subject knowledge content'. These suggestions referred to the need for pre-service teachers to acquire new subject content and practice regarding early childhood education. The research findings also relate to the expectations of teacher training in Thailand which endeavour to improve appropriate subject content offered to preschool teachers (Eggen & Kauchak, 2016).

Theme II: Individual tutorials

While sharing ideas within the focus group discussion, two preschool teachers claimed that they found it difficult to gain extra knowledge and experience regarding research practice and classroom management whilst working at a school. However, two pre-service teachers and two graduate students argued that learning opportunities should be offered by way of individual tutorials with a university supervisor who had the expertise in pedagogical research in early childhood education. Though these tutorials, preschool teachers could have clear direction on how to design appropriate learning activities for their students. In addition, preschool teachers could overcome student problems in association with classroom management and communications. A female preschool teacher advised that *'in tutorials, it would be great, if I had opportunities for discussion with a university supervisor who was a specialist in pedagogical research in early childhood education because I needed to receive his or her critical feedback and recommendations*'. This opinion shows that the role of a university supervisor as the expert in pedagogical research in early childhood education was important to supporting the problem resolution of preschool teachers regarding teaching preparation and management in the classroom (Devarakonda, 2013; Moberge et al., 2020).

Theme III: Curriculum management

Two headmasters and one university lecturer stated that the Postgraduate Programme in ECEM should be well-organised by following the educational requirements given by the quality assurance and the accreditation of the Postgraduate Programme. A sample view was given by a female headmaster, who claimed that *'I wanted to see the Postgraduate programme in ECEM to be well-organised by following the quality assurance because it was compulsory and it showed the quality of the programme'*. Another idea was shown by a male university lecturer who said that *'the accreditation of the programme should be the top requirement. It confirmed that the programme addressed the educational standards'.* Additionally, suggestions were made in connection with using innovative teaching approaches to support the understanding of preschool teachers. A sample idea was offered by a female preschool teacher who claimed that *'the courses in the Postgraduate Programme in ECEM should be designed and taught by using different teaching procedures and the application of educational innovation and digital technology in the class such as blended learning and hybrid learning*'. Moreover, one headmaster and two graduate students suggested that the Postgraduate Programme in ECEM should have different assessment and evaluation techniques which support preschool teachers who had different teaching and learning styles. A sample view was given by a male graduate student who pointed out that *'using diverse assessment and evaluation techniques was a great idea. I strongly recommended because we (focus group members) had individual styles of teaching and learning'.*

Discussion and conclusion

The research data showed that stakeholders offered ideas for enhancing the educational quality of the Postgraduate Programme in ECEM. Expectations and suggestions were given with respect to the collaboration between stakeholders throughout the programme and the focus on the trends of pedagogical content knowledge in early childhood education. Considering quantitative research data resulting from the questionnaire, the findings showed that an emphasis on stakeholders' roles and responsibilities on the programme was considered regarding the collaboration of all stakeholders throughout the process of pedagogical preparation, administration and assessment (Umam & Saripah, 2018). This idea was related to qualitative research data resulting from opinions from the focus group discussion. Explanations were given that although the Postgraduate Programme in ECEM was well-organised, it was expected to adopt the views of stakeholders for providing critical thoughts and feedback. A sample view was given by a headteacher who claimed that *'apart from addressing the educational requirements and obtaining the accreditation, improvement was needed in accepting diverse perspectives throughout the programme from all of us (stakeholders)'.* Additionally, one headmaster, two graduate students and two preschool teachers advised that understanding the trends of innovative teaching and learning could advocate new knowledge and skills required for applying for future careers as schoolteachers. A sample idea was presented by a graduate student who argued that *'the Postgraduate Programme in ECEM needed to update and upgrade its course specifications and learning outcomes in connection with the practical application of innovative pedagogical approaches in the classroom'.* This advice led the programme to concentrate on using new teaching and learning techniques for addressing the needs of stakeholders involved with early childhood education (Glatthorn et al., 2019). Following the interpretation of quantitative and qualitative research results, the prospects and suggestions became an essential guide for the development of the Postgraduate Programme in ECEM (Woolfolk, 2018).

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The Lifelong Learning Management Model for Good Agricultural Practice (GAP) Skills based on the Intelligence Agricultural Demonstration Farm for Farmers and Students at Suan Dusit University, Thailand

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ABSTRACT

This research was conducted for lifelong learning management model for Good Agricultural Practice (GAP) skills based on the intelligence agricultural demonstration farm for farmers and students at Suan Dusit University, Thailand. The methodology was to transfer the theoretical knowledge through a workshop, and to gain the required skills through an experimental practice in a smart farming area. In doing so, the participants in a demonstration were evaluated by the lifelong learning management model to develop safe farming skills. Participants included 46 farmers and 187 students by the purposive sampling method. The research tools were built with the Cronbach's alpha coefficient of 0.84, and the index of Item-Objective Congruence (IOC) of 0.78. The achievement assessment of the knowledge and understanding of the samples used the descriptive statistics and the paired sample t-test. The results of lifelong learning management model to develop a safe farming skill consisted of 4 aspects: 1) Creating a vision of lifelong learning 2) Organizing a relevant learning process 3) Constructing a connectivity to the learning resources, and 4) Building a connection among farmers, and a connection to the official agencies. The results of using the learning management model showed that the safe farming knowledge and skills were significantly improved when comparing the before vs. after training. The learning satisfaction were in the high levels in various aspects e.g., the suitability, the possibility, the utilization, and the application of knowledge.

Keywords: Lifelong learning, Safe farming skill

Introduction

According to the ASEAN strategic plan of action for cooperation in crops 2021-2025, Thailand has been fully aware of food safety and security (Thai agricultural awareness). Farmers therefore have to adjust themselves to develop the quality of agricultural products to meet the food safety standards developed by the international standards. The crops must be produced in accordance with the ASEAN Good Agricultural Practices (ASEAN GAP) system. ASEAN GAP is guidelines for agricultural products in order to obtain high quality and safe products. There are several requirements i.e., 1) the water resources, 2) the plantation areas, 3) the use of pesticides in farming, 4) the storage and transportation of products within the plantation, 5) the data validation, 6) the pest-free production, 7) the production processes to ensure the quality products, and 8) the harvest and post-harvest handling process.

Thailand is well known as a country for agricultural productions. A majority of the population in Thailand, 70% of the Thai people are employed and related to the agriculture sector (National Statistical Office, 2020). The annual revenue from exports of agricultural products has reached up to $13,328,942,187 (Department of Agriculture, 2022). The important economic crops of the country are e.g., rice, sugarcane, cassava, corn, and rubber. However, the world has shifted to safe farming which is free from any harmful toxic substances. The consumption of safe agricultural products is in high demand and the demand increases yearly, causing many national agencies to focus great efforts to change the farmer's production process in order to comply with the Good Agricultural Practice (GAP) standards. Various government agencies have organized meetings or seminars to educate farmers on their accountable for following GAP standards since 2017. However, the result of country's production is still far from its goal to implement safe farming process.

Suan Dusit University located in Central Thailand and is positioned as the local community development university. The main vision is to focus on the education management aimed at learner-centric, and to serve the local communities within its vicinity. Educating farmers in the vicinity to gain knowledge and a skill set on safe farming methods is a critical mission aligned with the country's mission. Therefore, a lifelong learning management model was developed for farmers and students in the smart safe demonstration farm named Hom Kajon Farm. Hom Kajon Farm was built to develop the farmer's skill sets to produce safe agricultural products. In addition, the education services were extended to the students in the Occupational, Health, and Safety program who learned how to develop safe agricultural production systems according to the occupational, health, and safety principles. To implement a proper use of farming chemicals for farmers and students, Suan Dusit University at the Suphanburi Campus, developed ae knowledge center that uses the University's research in science, technology, and innovation. Knowledge regarding farming is offered at Hom Kajorn Farm Learning Center", which is a smart safe agriculture model city. The knowledge and learning center of safe agricultural technology helps the local economy in Suphanburi, an area near the learning center. In the past, there were only 213 GAP certified farmers in Suphanburi with the area of 1,930 rais. GAP certification was relatively low compared to 68,908 farming families in Suphanburi Province (Office of Agriculture and Cooperatives, Suphanburi Province, 2020). According to the statistics of the Office of Agricultural Regulation, the agriculture in Thailand tends to rely on pesticides in the last several decades. Unfortunately, farmers have mishandled and overused the chemicals (Jai-aree, 2018). By researcher's field visit, it was found that most of the farmers lacked an understanding of safe farming. Besides, the farmers believed that the chemical fertilizers could produce a yield higher than the organic ones. Also, it was more convenient because the chemical fertilizers were ready-to-use without any preparation. In addition, the distributors of chemical fertilizers or pesticides offer various marketing incentives to farmers to use their products (reference). Therefore, the lifelong learning management model was necessary to farmers and students to understand the concepts and implementation of safe farming. The model is for raising safety awareness in agricultural production. In addition, the model is focused on preparing the production for food safety and security standards. The model was built for lifelong learning for all involved parties. In doing so, Suan Dusit University has the role as the provider

of knowledge and development center in order to share experiences and to exchange knowledge with all involved.

Research Objectives

1) Creating a lifelong learning management model to develop new safe farming skills for farmers and students using the smart safe agriculture demonstration farm as a knowledge center.

2) Experimenting with the lifelong learning management model to develop the necessary skills for smart safe agriculture.

3) Evaluating the use of the lifelong learning management model to develop the required skills for smart safe agriculture.

Research Methodology

The population for this research were the farmers of Khok Kho Tao and Chaeng Ngam Sub-district in Suphanburi Province. The study determined the specific sample size (Purposive Sampling) by selecting the sample group from the participated farmers who were practicing or interested in organic farming. The sample group consisted of 56 farmers along with 187 students in the Occupational, Health, and Safety program. The research proceeded as follows.

Step 1: Created the Lifelong Learning Management Model for Good Agricultural Practice (GAP) skills connected to the intelligence agricultural demonstration farm for farmers and students. The research team collected data by in-depth interviews with community leaders who currently participated in the organic or safe farming in Suphanburi Province.

Step 2: Experimented with the lifelong learning management model. The safe farming skills for farmers and students were developed by the workshop on GAP plantation along with a site visit to the Hom Kajon Farm at Suan Dusit University, Suphanburi Campus.

Step 3: Evaluated the lifelong learning management model for the safe farming skills. The evaluation process was conducted with the farmers and students by assessing the suitability, the possibility, and the utilization of knowledge.

Research Tools

1. In-Depth Interviews: The community leaders involved with organic or safe farming in Khok Kho Thao and Chaeng Ngam Sub-district in Suphanburi Province and student representative of the Occupational, Health, and Safety program all joined the interviews.

2. The Questionnaire: The questions to the participated farmers contained the following: basic information, current farming and its farming model, social status, membership status of the agricultural institute, the training and site visit experience as well as network group and official relationship. The questions to students consisted of basic information, GAP knowledge and regulation, safe use of agricultural chemicals, network group and official relationship. The mean score ranges between 1 and 5 and this range is divided in five quality classes, being very low (score 1-1.8), low (score 1.8-2.6), moderate (score 2.6-3.4), high (score 3.4-4.2), very high (score 4.2- 5.0).

Results

1. The results of the in-depth interviews with students and community leaders who were currently involved with organic or safe farming found that there were four key elements to influence the development of knowledges and skills for safe farming as follows:

    1) Creating a vision of lifelong learning: In order to promote the knowledge and the safe farming skills, the participating farmers suggested that the training should emphasize the importance and the necessity of safe agriculture, the reduction of production cost, and the increase of profit by implementing safe farming methods.

    2) Organizing a relevant learning process: The participating farmers identified that the problem occurred when the farmers were unable to apply the trainings to their daily activities. Therefore, the training should be selective with the related workshops for their practical usages. This would increase their knowledge and skill sets in the GAP farming production.

    3) Constructing a connectivity to the learning resources: The participating farmers mentioned that they were unaware of the forum for exchanging knowledge which is sharing activities. Besides, the seminars were also limited because there was no host to initiate the event. Moreover, there was no follow up to the related topics after the seminars and the forums were completed.

    4) Building a connection among farmers and a connection to the official agencies: The participating farmers indicated that there was lack of networking channels for communication. There was no communication network, nor were they aware of any available channel. Besides, they had to find their own ways to seek help or find answers to their questions. In addition, the corporation among parties was not well constructive. Therefore, there should be a solid network among the cross-agricultural groups. For the trainings and seminars, the invitation should go to related farmers to join and work together. Moreover, the detailed information should be provided to all participants, so the cross-cooperation between farmers could be formulated. For the problem between farmers and officials, there was a lack of public relations to present the communication channels to the related officials. In addition, the officials were not quite cooperative. When the trainings were over, there was no follow-up, nor the officials were disconnected. To improve the situation, the officials should improve their public relations via the social tools e.g., Facebook and Line applications, or Website.

2. The experiment of a lifelong learning management model to develop the safe farming skills was done by organizing the GAP plant workshop and a site visit to Hom Kajon Farm at Suan Dusit University, Suphanburi Campus. The policy implementors, the experts, and the operational officials were invited as speakers for the program. The training focused on the essential skills for lifelong learning, including the learning to know, the learning to work for a living, and the learning to live with others, as well as the learning to socialize. In addition, the learning also covered the big picture such as the changing trends in the world. The training also discussed methods for families to have stable economy. Topics included methods to build sustainability in the community.

    1) The basic information

    The genders of the participating farmers were 24 females (52.20 %) and 22 males (47.80 %). The majority were aged between 50-54 years (23.90 %), and most had an education level of bachelor's degree (54.30 %). The main occupation was agriculture (54.30 %). For the agriculture working experience, most had 1-3 years (34.80 %), followed by 10-12 years of working experience (19.60 %). For the land ownership aspect, the self-free-hold land were the

majority (84.80 %), followed by rental land (21.70 %). Most of the farmers were self-employed without extra employment (60.90 %). For the annual total income, the majority were in the range of 10,000 - 50,000 baht/household/year (17.40 %).

2) The current farming and its farming model

The majority of farmers engaged in vegetable (47.80 %), followed by the subsequent groups i.e., fruit (43.50 %), rice (41.30 %), garden (30.40 %), farming (15.2 %) and others such as forestry, herbs, kitchen garden, animal farm, fishery, and ornamental plants (19.60 %). For the farming model, the majority of farmers engaged in mixed farming (41.30 %), subsequent by the following; the organic farming (34.80 %), the single crop farming (23.90 %), the new theory agriculture (19.60 %), the natural agriculture (15.20 %), others such as Kok Nong-Na model and the vegetable garden (6.50%), and the least, the agro-forestry (4.30 %).

3) The prominent social status

Most of the farmers had no prominent social status (84.80 %). For those with the special social status (15.20 %) was distributed to the following; Sub-district or Village headman (28.57%), Village committee (28.57%), and others such as Vice President, Thai SME Confederation at Suphanburi, Royal Rain Volunteer, and Sub-district Chief Inspector.

4) The membership status of the agricultural institutes

Most of the farmers were members of an agricultural institution (54.30%), and non-member showed 45.70%. The majority of membership were in the community enterprises (30.40%), followed by the farmer groups (23.90%), BAAC customer group (13.00%) as well as the cooperatives, the agricultural occupation, and others (2.20 %).

5) The training and site visit experience

Most of the farmers had attended trainings or site visits (54.30%), while 45.70 % had never attended any program.

6) The farmer's agricultural learning

As for the farmer's learning in agriculture, the self-learning or trial-and-error were the majority with common ($\bar{\chi}$= 4.07, S.D. =0.80). The next group learned from the internet ($\bar{\chi}$= 4.04, S.D. =1.05). Thereafter, the following groups learned from the guru ($\bar{\chi}$= 3.72, S.D. =0.89). Regarding group learning, the farmers learned from lectures by the experts, which were the most common ($\bar{\chi}$= 3.37, S.D. =1.10). The next group learned by the demonstration from the experts ($\bar{\chi}$= 3.26, S.D. 1.02). Also, the following group learned by site visits and workshops ($\bar{\chi}$ = 3.13, S.D.=1.07).

3. The achievement assessment for farmers and students

The results of achievement assessment by the participating farmers, taken before and after learning, showed the deviation at the statistically significant level of 0.05 (p-value <0.05) for all aspects. In overall comparison, the level of confidence of farmers before the training were at a moderate level ($\bar{\chi}$ = 3.04, S.D. =0.97). After the training, the level was high ($\bar{\chi}$=3.88, S.D.=0.85). After the training, the change occurred among the farmers with a higher average. According to the specific aspects after the training, the changes in oneself was at a high level ($\bar{\chi}$= 4.16, S.D. = 0.85). Also, the change in the network aspect was at a high level ($\bar{\chi}$ = 3.72, S.D. = 0.87) as shown in Table 1.

According to oneself changing, the results of the achievement assessment of the farmers before and after the learning were at the statistically significant level of 0.05 (p-value < 0.05) in every aspect. It was found that the farmers had the level of confidence after-the-training higher than that for before-the-training as shown in Table 1. After training, the following scores showed: The participated farmers were enthusiastic about the agricultural activities ($\bar{\chi}$ = 4.15, S.D. =0.88). They could initiate new ideas that could induce other activities ($\bar{\chi}$= 4.12, S.D. = 0.87). They were proud of working in agriculture ($\bar{\chi}$

= 4.10, S.D. = 0.94). They could make a high quality and efficiency of agricultural activities/productions ($\bar{\chi}$ = 4.08, S.D. = 0.88). Their skills, knowledge, and expertise in agricultural activities were improved ($\bar{\chi}$ = 4.35, S.D. = 0.94) as shown in Table 1.

According to the change among the network group, the participating farmers had the level of confidence after-the-training higher than that of before-the-training. Before the training, the average level of confidence was at a low level ($\bar{\chi}$ = 2.50, S.D. =1.00). After the training, the farmers had the average level of confidence at high ($\bar{\chi}$ = 3.72, S.D. =0.87). After the training, there was a change impact in the network group which enabled them to see their peers in their profession ($\bar{\chi}$ = 3.80, S.D. =0.95). Next, they were enabled to exchange the knowledge and share their opinions among the network group ($\bar{\chi}$ 3.78, S.D. =0.91). Also, they were enabled to understand the market opportunity ($\bar{\chi}$ = 3.59, S.D. = 0.99).

According to the official relationship, the participating farmers also had a higher level of confidence after-the-training than before-the-training. Before training, the average level of confidence was at a moderate level ($\bar{\chi}$ = 2.98, S.D. =1.11) compared to after training, the average level of confidence was at a high level ($\bar{\chi}$ = 3.76, S.D. =1.04). After training, there was a change impact in their perceptions to work with the officials, in which the farmers had a good attitude towards the officials ($\bar{\chi}$= 4.00, S.D. = 0.99). Next, they felt comfortable with a quick access of information ($\bar{\chi}$= 3.76, S.D. = 1.11). Besides, they felt more secured and understood one another like a brotherhood ($\bar{\chi}$= 3.68, S.D. =1.08). They also felt better about receiving attention from officials for a site visit and for obtaining advice ($\bar{\chi}$= 3.59, S.D. =1.23) as shown in Table 1.

The achievement assessment of participating farmers and students found that their opinions towards the training program were at the highest level in all aspects. Those were i.e., the suitability, the possibility, the utilization, and the application of the program.

Table 1: The changing level of confidence of farmers by the aspects

Aspects	Before training			After training			P-Value
	$\bar{\chi}$	S.D.	Confidence levels	$\bar{\chi}$	S.D.	Confidence levels	
Overall change occurring to the farmers	**3.04**	**0.97**	**Moderate**	**3.88**	**0.85**	**High**	*
The change of oneself	**3.33**	**1.05**	**Moderate**	**4.16**	**0.85**	**High**	*
1. Being proud of working in agriculture	3.66	1.17	High	4.10	0.94	High	*
2. Being enthusiastic about the agriculture activities	3.39	1.14	Moderate	4.15	0.88	High	*
3. Being initiative to new ideas that could induce other activities	3.13	1.16	Moderate	4.12	0.87	High	*
4. Feeling improvement in skills, knowledge, and expertise in agricultural activities	3.23	1.03	Moderate	4.35	0.94	Very High	*
5. Being high quality and efficiency of agricultural activities/products	3.23	1.07	Moderate	4.08	0.88	High	*

Aspects	Before training			After training			P-Value
	$\bar{\chi}$	S.D.	Confidence levels	$\bar{\chi}$	S.D.	Confidence levels	
The change on network group	**2.50**	**1.00**	**Low**	**3.72**	**0.87**	**High**	*
1. Enabling to see the peers in their profession	2.44	1.09	Low	3.80	0.95	High	*
2. Enabling to see the market opportunity	2.57	1.02	Low	3.59	0.99	High	*
3. Enabling to exchange the knowledge and sharing their opinions among the network group	2.49	1.04	Low	3.78	0.91	High	*
The change on official relationship	**2.98**	**1.11**	**Moderate**	**3.76**	**1.04**	**High**	*
1. Feeling good attitude towards the officials	3.30	1.15	High	4.00	0.99	High	*
2. Feeling more secured and understood one another like a brotherhood	2.93	1.12	Moderate	3.68	1.08	High	*
3. Feeling better to get attention from officials for a site visit and a receiving advice	2.84	1.21	Moderate	3.59	1.23	High	*
4. Feeling comfortable for a quick access of information	2.84	1.28	Moderate	3.76	1.11	High	*

Remark: * The mean deviation at statistically significant level of 0.05.

The achievement assessment for the students who attended the training were from 155 females (82.89 %) and 32 males (17.11 %). For these students, the knowledge assessment conducted before and after the training found that the students had increased their knowledge and understanding after the training. In overall comparison, the level of confidence of students before the training were at a low level ($\bar{\chi}$ = 2.58, S.D. =0.94). After the training, the level was high ($\bar{\chi}$=3.77, S.D.=0.85). According to the specific aspects after the training, the changes in oneself was at a high level ($\bar{\chi}$= 4.05, S.D. = 0.98). Also, the change in the network aspect was at a high level ($\bar{\chi}$ = 3.54, S.D. = 0.87) as shown in Table 2.

According to oneself changing, the results of the achievement assessment of the students before and after the learning were at the statistically significant level of 0.05 (p-value < 0.05) in every aspect. It was found that the students had the level of confidence after-the-training higher than that for before-the-training as shown in Table 1. After training, the students were GAP knowledge at a high level ($\bar{\chi}$ = 4.03, S.D. =0.99). GAP regulation at a high level ($\bar{\chi}$= 3.97, S.D. = 0.85). Also, they were safe pesticides and agricultural chemical usage at a high level ($\bar{\chi}$ = 4.16, S.D. = 0.90) as shown in Table 2.

According to the change among the network group, the students had the level of confidence after-the-training higher than that of before-the-training. Before the training, the average level of confidence was at a low level ($\bar{\chi}$ = 2.04, S.D. =0.88). After the training, the students s had the average level of confidence at high ($\bar{\chi}$ = 3.54, S.D. =0.87). After the training, there was a change impact in the network

group which enabled them to see their peers in their profession ($\bar{\chi}$ = 3.63, S.D. =0.96). Next, they were enabled to exchange the knowledge and share their opinions among the network group ($\bar{\chi}$ 3.51, S.D. =0.91). Also, they were enabled to understand the market opportunity ($\bar{\chi}$ = 3.49, S.D. = 0.98).

According to the official relationship, the students also had a higher level of confidence after-the-training than before-the-training. Before training, the average level of confidence was at a moderate level ($\bar{\chi}$ = 2.98, S.D. =1.11) compared to after training, the average level of confidence was at a high level ($\bar{\chi}$ = 3.76, S.D. =1.04). After training, there was a change impact in their perceptions to work with the officials, in which the students had a good attitude towards the officials ($\bar{\chi}$= 4.07, S.D. = 0.99). Next, they felt comfortable with a quick access of information ($\bar{\chi}$= 3.45, S.D. = 0.98). Besides, they felt more secured and understood one another like a brotherhood ($\bar{\chi}$= 3.81, S.D. =1.08). They also felt better about receiving attention from officials for a site visit and for obtaining advice ($\bar{\chi}$= 3.60, S.D. =1.06) as shown in Table 2.

The achievement assessment of participating farmers and students found that their opinions towards the training program were at the high level in all aspects. Those were i.e., the suitability, the possibility, the utilization, and the application of the program.

Table 2: The changing level of confidence of students by the aspects

Aspects	Before training			After training			P-Value
	$\bar{\chi}$	S.D.	Confidence levels	$\bar{\chi}$	S.D.	Confidence levels	
Overall change occurring to the students	**2.58**	**0.94**	**Low**	**3.77**	**0.85**	**High**	*
The change of oneself	**2.88**	**0.95**	**Moderate**	**4.05**	**0.98**	**High**	*
1. Being GAP knowledge	3.38	0.93	Moderate	4.03	0.99	Iligh	*
2. Being GAP regulation	2.14	0.94	Low	3.97	0.85	High	*
3. Being safe pesticides and agricultural chemical usage	3.11	0.84	Moderate	4.16	0.90	Iligh	*
The change on network group	**2.04**	**0.88**	**Low**	**3.54**	**0.87**	**High**	*
1. Enabling to see the peers in their profession	1.94	0.92	Low	3.63	0.96	High	*
2. Enabling to see the market opportunity	2.03	0.87	Low	3.49	0.98	Iligh	*
3. Enabling to exchange the knowledge and sharing their opinions among the network group	2.14	0.85	Low	3.51	0.91	High	*
The change on official relationship	**2.82**	**0.99**	**Moderate**	**3.73**	**1.07**	**High**	*
1. Feeling good attitude towards the officials	2.72	1.03	Moderate	4.07	0.99	Iligh	*

Aspects	Before training			After training			P-Value
	$\bar{\chi}$	S.D.	Confidence levels	$\bar{\chi}$	S.D.	Confidence levels	
2. Feeling more secured and understood one another like a brotherhood	2.91	0.97	Moderate	3.81	1.08	High	*
3. Feeling better to get attention from officials for a site visit and a receiving advice	2.76	0.91	Moderate	3.60	1.06	Iligh	*
4. Feeling comfortable for a quick access of information	2.88	1.11	Moderate	3.45	0.98	Iligh	*

Remark: * The mean deviation at statistically significant level of 0.05.

Conclusion and Discussion

1. The lifelong learning management model to develop a safe farming skill consisted of 4 aspects: 1) Creating a vision of lifelong learning 2) Organizing a relevant learning process 3) Constructing a connectivity to learning resources and 4) Building a connection among farmers, and a connection to the official agencies. For the workshops to the farmers and students, they should focus on the essential skills for a lifelong learning i.e., learning to know, learning to work for a living, learning to live with others, as well as the learning to socialize. In addition, the learning should also cover the big picture such as the changing trends of the world. In addition, universities should be the important resources to drive a lifelong learning model. Suan Dusit University is the appropriate learning resource because it has the agricultural technology center on safety farming and it is easy to assess due to the location within the local community. According to the research by Poungsuk (2017), the agricultural education must rely on the principle of action learning. Learning agriculture requires the actual practice to build up skills and experiences and it helps in applying the knowledge into daily life.

2. The results of lifelong learning management model on safe farming skills based on the intelligence agricultural demonstration farm for farmers and students of Suan Dusit University found positive outcomes in every aspect of the knowledge and the safe farming skills. Both farmers and students had an average level of confidence before the training and after-the-training the level was higher. They were proud of working in agriculture. Besides, they were enthusiastic about the agricultural activities. They could initiate new ideas that could induce other activities. Moreover, their skills, knowledge, and expertise in agricultural activities were improved. They could make high quality and efficiency of agricultural activities and productions. In addition, they were enabled to see the peers in their profession as well as to see the market opportunity. They were enabled to exchange the knowledge and share their opinions among the network group. Besides, they had good attitudes towards the officials. They felt more secured and understood one another like a brotherhood. Moreover, they felt better about receiving attention from officials for a site visit and obtaining advice as well as the ability to obtain quick access of information. The results were in line with the study by Kunpalin et. al (2019), which examined the guidelines for promoting a lifelong learning model among farmers in the organic vegetable farming in order to increase the community economy. It was found that the knowledge, the experience sharing, and the networking were good strategies in a lifelong learning model for farmers and allowed for continuing their learning in the future. For students, they are unable of fully comprehending what they learn without experience. For students, they are unable of fully comprehending what they learn without experience. Farms are valuable learning spaces for illuminating a range of subjects, including farming, social challenges, safe

agriculture, and sustainable development (Krogh & Jolly, 2012). Lifelong learning on safe farming skills based on Intelligence Agricultural Demonstration Farm for students Hence, it is beneficial for future student careers.

Recommendations

The lifelong learning management model on safe farming skills based on the intelligence agricultural demonstration farm should expand its model results to nearby provinces. For students, there should be a network of young, smart farmers who specialize in safe farming in Central Thailand.

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Weathering the Pandemic: The 'What If' Experience in Scenario Planning

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ABSTRACT

The pandemic brought overwhelming uncertainties. Suddenly, it also became an urgent call for the school management leaders to take decisive action and ensure that institutions of higher learning remain resilient. For this institution in review, it did not have a choice but plan through these uncharted waters and ensure that the university continue to serve its instructional mandate. Planning in uncertainties can be confounding; the novelty of the situation that "lacks antecedents make it complicated to look back in time for clues about future" (Knight, 1921, 2009). In this situation, scenario planning makes sense considering it to be that part of strategic planning which relates to the tools and technologies for managing the uncertainties of the future (Chermack, Lynham, & Ruona, 2001). This paper recounts how scenario planning figured significantly in drawing the strategic plan of a university to address the ambiguous challenges COVID-19 brought. The process involved the use of the Scenario Model developed by Heidrick & Struggles as discussed by Barnakova, Snyder, & Skoritowski (2020). Four (4) 'what if' scenarios were generated against the backdrop of economic recovery and social trust and were assigned to each of the four (4) teams to build a playbook that the scenario may likely be in the future. Proposed strategies for their 'what if' worlds were then generated. This paper narrates the entire process of the institution's scenario planning in its bid to weather the pandemic that wrought ambiguities in education sector and practically in all aspects of the society. Goals, strategic priorities, and outcome measures were identified based on the strategies created across the four scenarios and became the backbone of the institution's strategic plan for the next three years.

Keywords: Scenario planning, Strategic foresight, scenario thinking

Introduction

Just when higher education institutions were at the midst of addressing an unclear volatile future ushered mainly by rapid technological pace, increasing economic interdependence and the mounting political volatility, COVID-19 hit. The pandemic caught practically everyone off-guard that created an encompassing uncertainty. The presence of COVID-19 has forced many higher education institutions to remake its instructional mandate and shifted from the traditional mode to online teaching and online services. From the angle of the resource dependence theory, when the external environment changes, universities will selectively respond to needs related to survival or growth (Shin, 2010). As a radical response of the university, shift from the traditional instructional mode, online teaching and learning was implemented with due consideration to the ICT status of both students and teachers, and the school administration. Because of its newness, the learning management system was fraught with challenges -- kinks needed to be ironed out reactively to ensure standards of academic quality and integrity in all aspects of teaching and learning are not compromised. The university's ICT infrastructure and human capability have been instrumental in subsisting the pandemic's blow day after day.

But the institution was also aware that the institution could not continue to subsist/ and or be reactive in living one day at a time in a period fraught with uncertainties. Consequently, an urgent mandate to craft a strategic plan was released by the top management. The need to "to build permanent but flexible bridges between actions in the present and thinking about the future" was urgently indispensable (Scoblic, 2020). With the many sudden uncertain challenges that COVID-19 has brought, planning seemed impossible, because in the past, experiences were essential in establishing future actions. Studies have recognized "that uncertainty is marked by novelty, that lacks antecedents, and it makes little sense to look back in time for clues about the future" (Knight, 1921, 2009). Scenario planning was the only option.

This article narrates a story of the University's experience as it went through the process of scenario planning that became the conduit in the creation of a three-year strategic plan. The value of this report lies primarily on what it can offer in higher education in crafting a strategic plan amid uncertainties. While the background of this project may limit the generalizability of findings, it is recognized that even the uniqueness of this university experience may offer insight on the effectiveness of the scenario planning process in setting directions even in times of ambiguities.

Related Literature

The term 'scenario planning' has been defined in several ways. Cambridge Business English Dictionary defined it as the study of possible future events in society, an industry, the economy, etc., and how they might affect an organization, and the action of planning to prepare for them, while Ringland (2014). Kotler & Keller (2012), on the other hand, defined scenario planning as a process of strategic planning that bank on tools and technologies for managing the uncertainties of the future. For Schoemaker (1995), however, scenario planning "is a disciplined method for imagining possible futures that companies have applied to a great range of issues." Scenarios should describe generically different futures rather than variations on one theme (Shoemaker, 1955). Also, scenario planning is a disciplined way to formulate strategic hypotheses in the context of existing driving forces and their uncertainties (Savkin, 2022). There are a ranged of definitions but there are common threads that run across these definitions such as working within uncertainties pointing out that they are not predictions or forecasts. It points to imagining or perceiving of future and uncertainties with strategic foresight, making simpler several data that used to be considered in a conventional planning, into a limited number of possible states. A useful analogy of Horwarth (2006) likened scenario planning to driving a car: it uses the windshield or future to navigate rather using the rearview mirror or the past.

The development of scenario planning is commonly credited however to Herman Kahn (1967, 2000). This was heightened with his experience at Rand Corporation (a non-profit research and development organization) for the US Government in the 1950s, and his formation at the Hudson Foundation in the 1960s. He shared his ideas to the Royal Dutch Shell in the 1970's, through Pierre Wack, who used

Kahn's concepts in the business world by creating scenarios to help Shell weather the uncertainties brought about when the oil-rich nations in the Middle East began to assert themselves on the global oil market. When the infamous OPEC oil embargo in terms of price shocks happened in 1973, it was said that Shell was able to weather the crisis out much better than its competitors (Scoblic, 2020). Scenario planning became more formalized as a planning approach in the corporate world after the Royal Dutch Shell and the Consulting Firm SRI International successful experiences in 1970s (Scoblic, 2020; Fahey & Randall, 1998).

In planning, this paper finds the thoughts of Fulton & Scearce (2004) on scenario thinking simpler. It used 'What If?' as a tool for motivating people to question the prevailing status quo. Asking 'What if?' in a disciplined way prepares one to practice the possibilities of tomorrow, and then act at present because the plausibility of the propositions and insights are empowering. It can be considered a practice for the future as Aldabbagh & Allawzi (2019) put it, that scenarios are about structuring events or stories about how the future will develop accordingly. Varied methods when doing scenario planning abound in literature, but they all follow and all boil down to the identification of the major forces that drive uncertainties (Savkin, 2022; Ogilvy, 2015).

Uncertainties are manifestations that the behavior of complex systems such as organizations may follow laws and yet their future status remain unpredictable in principle. In Edward Lorenz's Chaos Theory he explained that the behavior of complex systems is exquisitely sensitive to conditions, so that small changes at the start can result in ever larger changes over time as what happened to the recent pandemic. Lorenz hypothesized in his 1963 paper on Chaos Theory, "Does the flap of a butterfly's wings in Brazil cause a tornado in Texas? *Snyder, Skoritowski, Roeder, and Libson (2020)* said "substitute a bat in a Wuhan wet market for the butterfly and the spread of the coronavirus for the weather, and you have the same effect showing how fragile and uncertain our world is." Lorenz from his series of experiments with Mathematical models realized that the imprecision which is innate in human measurement could become magnified into wildly incorrect forecasts. The same condition can also be in the business or social world. In the words of the authors:

> Scenario planning provides a framework for combatting natural human biases and challenging entrenched mindsets of leaders and organizations amid uncertainty and crisis situations. While living in scenarios can be a humbling process, it helps to mitigate risks of overweighting the present, building plans based on a predictable future, and being excessively overconfident in forecasts. Scenarios are more than just engaging stories; they are plausible "what ifs" that challenge prevailing beliefs and instill agility, adaptability, and resilience to plan for a world that is much more uncertain than we tend to acknowledge.
>
> *Snyder, Skoritowski, Roeder, and Libson (2020)*
> *Planning for Post-Covid-19 Workforce: Four Scenarios*

In 2020, Heidrick & Struggles developed the scenario model after a thorough study of potential forces shaping the human capital in a post Covid 19 scenario that involved 40 leaders to identify 70 potential forces. They recognized 30 key trends and uncertainties based on assessments and likelihood and impact for each force. The identified highest impact uncertainties and range of outcomes were combined to formulate the two-by-two scenario mix that was built around economic recovery and social trust. Scenarios present a framework for challenging conventional thinking, identifying market opportunities, and mitigating strategic risks. They went further to develop additional detail for each scenario in terms of key themes and early signals (Barnakova, Snyder, & Skoritowski, 2020). The 2x2 scenario mix developed are a) *digital enclaves*, this is when social trust is low but the economic recovery is high; b)

growing divide, when economic recovery is low and the social trust is also low; c) *tech-powered humanity*, economic rebound is high and social trust is high; and d) *in this together*, the economic recovery is low but the social trust is high.

Popular in business, scenario planning also figures in the higher education landscape. Many higher education institutions have been using this approach extensively. To cite a few, Purdue University, Fort Wayne, Indiana reported a highly collaborative three-week scenario planning process that created broad engagement with more than 13% of the university's full-time employees. It demonstrated the value placed on faculty and staff expertise input and helped to build long-term buy-in and trust. This approach also informed the university's planning processes for the 2021-2022 academic year, which emphasized leveraging their COVID-19 experiences to build a better normal for the said university (Malanson, 2022).

A Melbourne based consulting firm, SJS Strategy, reported a Scenario Planning Case Study at the Royal Melbourne Institute of Technology (RMIT). Among the foremost outcomes included key performance indicators that shaped the future environment, a range of relevant and plausible future scenarios, and alternatives that can address the challenges of the organization. At the end of the scenario planning processes, with the alignment about the future, RMIT decisionmakers have the wider options to congregate crucial assumptions and choices (SJS Strategy, 2019).

Sayers (2010) cited case studies in higher education starting with Universiti Sains Malaysia that used scenario planning for crafting their vision. It was participated by 20 top level leaders, senior administrators, officers, and academics representing the various schools and campuses of the university. The whole process ended with their vision for the next 25 years which they called 'University in the Garden'. Another case of scenario planning was that of the Open University (UK). This time, the process took a longer period since the purpose of the university was culture change "something which does not happen quickly" (Sayers, 2010). In this case, scenario planning was used not just over a single period for planning purposes but became an ongoing practice. It was reported that the preliminary scenario planning process was the most in-depth and was described as a major culture change. It was also considered as a major strategic thinking event. Strategic conversations remained as a continuing practice at the OU, together with various scenario planning exercises. These became subsequently a means to refresh and continue the change in culture and thinking (Sayers, 2010).

In the Philippines, Southern Leyte State University (SLSU) conducted a webinar foresight-scenario planning session to identify robust and realistic strategies as well as to revisit and update the university's strategic plan. In August 2021, the institution conducted a scenario planning focused on strategic challenges in relation to the existing Seven-Year Development Plan. Likewise, the activity also revisited the strategic map of the university's vision, mission, core values, goals, objectives, and accomplishments and gaps to formulate strategic objectives, and measures and targets. "While it cannot predict the future, it however scans and analyzes the environment to identify potential outcomes and how they might impact SLSU especially the long-term effect of COVID-19," according to (Teves, 2021), in emphasizing the importance of conducting the scenario planning activity.

Studies revealed that the major benefit of scenario planning, beside trying to foresee the future, is encouraging managers to explore strategic responses beyond their previous experiences and to make strategic decisions in a rapidly changing environment. Research findings showed that scenario planning has a positive and significant effect on strategic innovation. (Gray et al, 2020 in Malekakhlagh, Safari, Beigi, & Rokhideh (2022). Going beyond previous experiences encourages innovative thinking. An article published by Wharton Executive Education, "Scenario Planning: Where Strategy and Innovation Intersect", recommends scenario planning for organizations that want to switch from constantly being reactive to a more strategically proactive position, this mode when used, opens envisioning and planning for possible future changes that creates opportunities for innovation.

The Scenario Planning

The Preliminaries. When the University decided to use Scenario Planning as its tool for the 2021-2024 Strategic Plan, a team was formed to lay the groundwork for the actual planning workshops. This was composed of top-level leaders, middle level administrators, faculty members with rank and file personnel. Sequential group dynamics were characterized with meaningful sessions of brainstorming and consensus-building as the team discussed the intricacies of scenario planning. Further discussions on Chaos Theory of Edward Lorenz also ensued. After having gone through the educational group processes, it decided to recommend the use of Scenario model of Heidrick and Struggles by Barnakova, Snyder, & Skoritowski (2020) as its guide in the actual workshop. This was further supplemented with other relevant literature and studies and reinforced with *Snyder, Skoritowski, Roeder, and Libson (2020) in their article Planning for the Post-COVID-19 Workforce* published in the business journal by Wharton School, University of Pennsylvania. The team was convinced that the scenario mix/key drivers proposed by Barnakova et al. (2020) was the most appropriate guide to develop the university's strategic plan for the next three years in the new normal. It also decided to use the 'what ifs' context (Fulton & Scearce, 2004). Andrews of KPMG (2020) strongly recommended that for universities to subsist, charting directions that shall use "what if" scenarios, specifically for their own setting, is indispensable. The following outputs in were laid out in preparation for the scenario planning workshop. Please see Figure 1.

Particulars	**Details**
Objective	To draw a three-year University strategic plan 2021-2024
Prevailing Situation/ Key Drivers	Post Covid – 19: The New Normal
Timeline	Two months
Scenario Mix with 2x2 matrix	Economic Recovery and Social Trust Digital enclaves, Growing divide, Tech powered economy, and In this together (Barnakova et. al., 2020)
Activities	Round Table Discussions/Workshops/ Writeshops/
Participant Requirement	Inclusion criteria: At least three years with the University, cross-sectional from across the ranks, highly recommended by their immediate supervisors as individuals known for their foresight thinking. No. of Participants: 25

Figure 1: Summary of the Details for the Scenario Planning Workshop

Since the University's Roadmap 2020 was on its last year, and the prevailing situation of Post Covid-19, the new normal, the team agreed that the workshop shall draw the institutional 2021-2024 Strategic Plan using the scenario planning model of Barnakova et. al. (2020); Heidrick and Struggles (2020). Furthermore, recommendation for the use of scenario mix with the two-by-two matrix using economic recovery and social trust as the determining axes to create the four quadrants (scenarios): *digital enclaves, growing divide, tech powered economy,* and *in this together.* Preliminary informational reading materials were sent to the prospective participants to be studied before coming to the actual planning workshops. Included in the materials is the Vision, Mission, Goal of the university. Participants with 'significantly different organizational roles, points of view, and personal experiences' were chosen having in mind Kees van der Heijden's (2005) advice about participants - three powers necessary for any effective conversation about strategy: the power to perceive, the power to think, and the power to act.

The Workshops. The activities were on a working assumption that these powers are basic in strategic foresight, the tool for scenario planning. Scenario thinking can help organizations better anticipate and

adapt to dramatic changes, increase agility and resilience, and turn uncertainty into advantage (Gailey, 2020). Hence, workshop activities started with group dynamics that aimed to enhance the strategic foresight of the participants. The first workshop was conducted in a span of two days.

Discussions on the intricacies of scenario planning where critical questions were emphasized as points of reflections in the scenario planning framework. Open forums were facilitated to allow participants to clarify/verify some gray areas of the planning processes. The participants were also reminded that the institutional Vision and Mission shall necessarily comprise the guiding star in the activities and reference fall backs when there were stand offs in the consensus building within the team and even in the plenary sessions.

Four (4) teams were organized and within, they further discussed the dynamics of scenario planning through guide questions. Given ample time for the thorough discussion, the four (4) 'what if' scenarios were introduced against the backdrop of *economic recovery* and *social trust*. Each team was assigned a scenario to build the playbook on what the university may likely be in the future for such scenario. In their brainstorming and consensus building, the questions used Snyder's et. al. (2020) guide: "Where are we headed?", "Would our current organizational structure meet the future we painted in our playbooks?", "What talents shall we be needing?", "What cultural values should we be needing to fit into the future?", "Are we ready to go full digitalization?" Figure 2 presents the actual playbook created by each team in each scenario. Their outputs were also presented during plenary sessions; comments and recommendations were also considered.

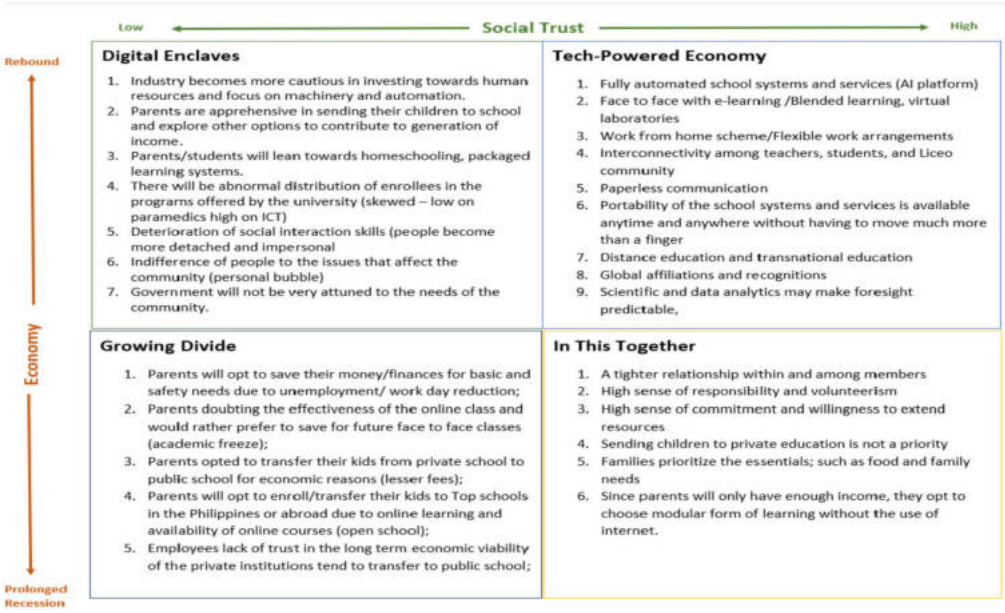

Figure 2: Summary of Playbooks Created by Each Team Given their "What If" Scenario

Figure 2 shows the four (4) "what if" scenarios with their respective playbooks. The teams painted the scenarios with what they conceived as their 'specific futures'. For *digital enclaves*, where social trust is low but with the regained economy, parents were assumed to be wary of sending their children physically to school; deterioration of social interaction as well as indifference to community issues were also foreseen to happen. Preference for homeschooling was considered. This was what was referred to all along when the authors described this scenario that people in *digital enclaves* take on new behaviors, where virtual interactions and small groups are preferred because of accessibility and health concerns (Heidrick et al. (2020). Unemployment was also presumed to occur as industries shift to machines and

automation. On the other hand, *in growing divide*, when both the economy and the social trust are low, being the worst scenario. *Snyder et al (2020) described this as a world in which a protracted economic recession fractures trust between people, communities, and institutions.* Parents are implicitly most affected, and in cases of lack of trust on the long-term economic viability of private institution, decisions of transferring their kids from private school to the public schools would likely happen because of lesser cost in tuition fees. There is a stark 'digital divide' where parents who can still afford may transfer their children to 'top schools' in the country or abroad for online class arrangements. For the scenario of '*In this together*', social trust is high but economic recovery is still low. Tighter relationship within family members was likely to happen, and stretching of resources, volunteerism may also come about. Heidrick et al (2020) described this world as "the prolonged impact of virus brings communities/*families* together." *Snyder et al (2020) also says that "from a long lockdown, but families, communities and NGOs have come together to support one another."* Parents may not send children to private schools is not a priority; food and family needs become more of the major concerns. Parents with just enough income for family needs chose to enroll their children on the modular form of learning without the use of internet. In the '*Tech-powered*' scenario where both the economy and social trust has recovered, a fully automated school system and services that include blended learning and virtual laboratory, with workable 'work from home'/ and or flexible work arrangements can happen. Interconnectivity among teachers, students, and the university community, distance education/transnational education, scientific and data analytics, as well as global affiliations and recognitions were seen as most likely situation in this scenario.

Moving from Scenarios to Decisions. After creating their playbooks in their respective scenarios, the teams were asked to discuss in their respective group and brainstorm on the question: *What should we be doing now that would enable us to operate better in these specific futures?* Given ample time to brainstorm, each team huddled and reviewed the specific futures they have described in their scenarios.

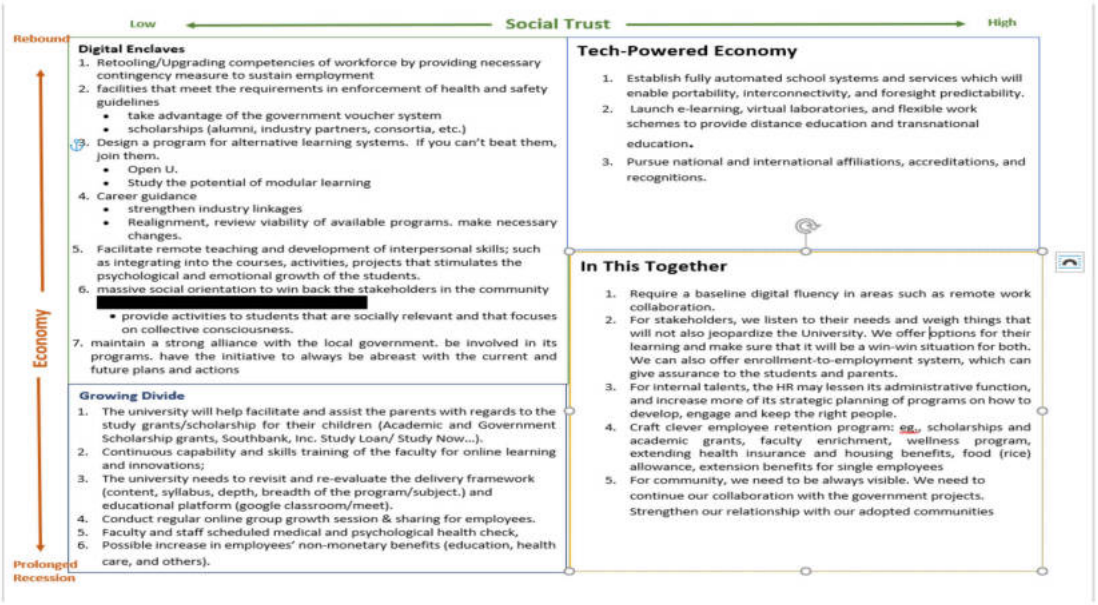

Figure 3: Summary of Original Strategies of Each Team Given their "What If" Scenario

After the sessions of brainstorming and consensus building, they generated proposed strategies to address their 'what if' worlds - - their specific futures. Figure 3 shows the first round of strategies identified by each team. These initial strategies were presented during the Plenary Sessions. Some comments and recommendations were considered. The strategies presented by each group were intended to address the situation stated in their playbooks. These were further studied by each group considering the comments

and suggestions from the panel during the plenary session. Another session was again provided with the opportunities to compare notes and determined some commonalities that run across the four scenarios. Presentation of their strategies, including some details that give flesh to the broad strategy statements. This was followed with a thorough analysis and comparing of notes. After each group have presented, observations were noted from the plenary sessions such as common strategies. There were similar strategies that were expressed by the teams, and these are shown in Figure 4.

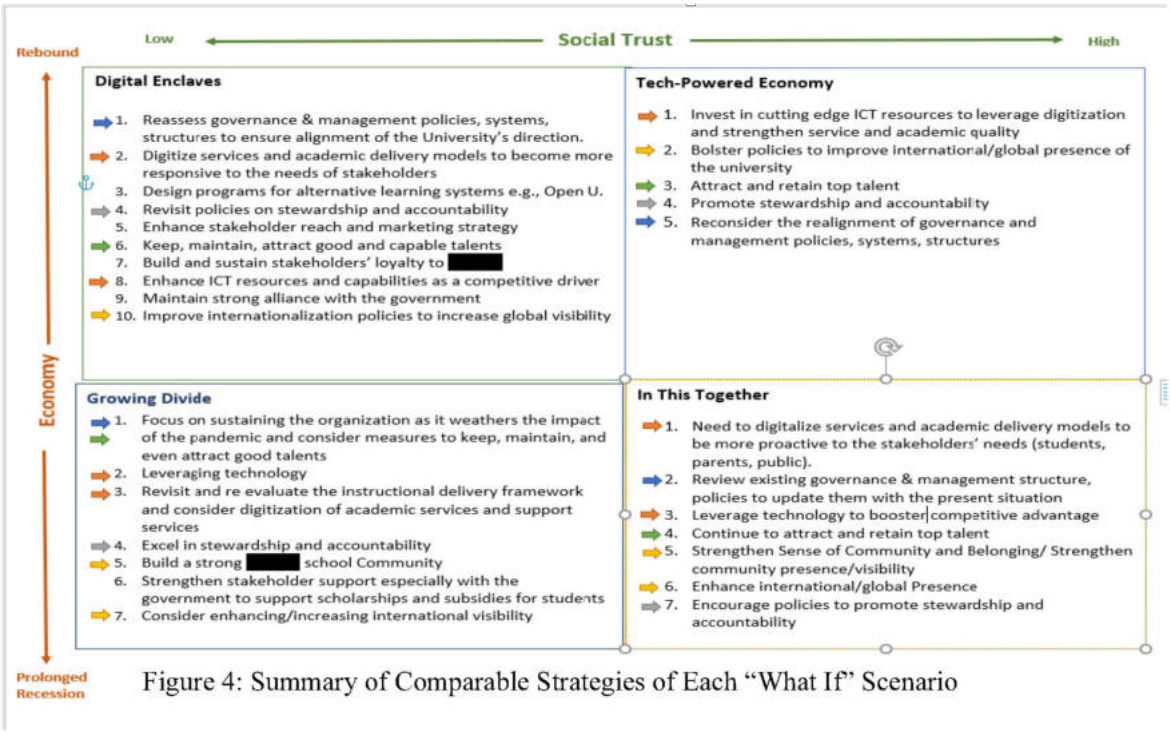

Figure 4: Summary of Comparable Strategies of Each "What If" Scenario

Figure 4 shows the parallel strategies in colored arrows expressed by the teams, although stated differently but directed to identical concerns. Among these were the need for the "university's governance & management to revisit policies, systems, and structures, ….", "digitization of services & academic delivery models….", stewardship and accountability", "leveraging technology", "enhancing global presence", among all others. During the presentation, these major strategies were presented with corresponding detailed approaches. An example is presented in Figure 5.

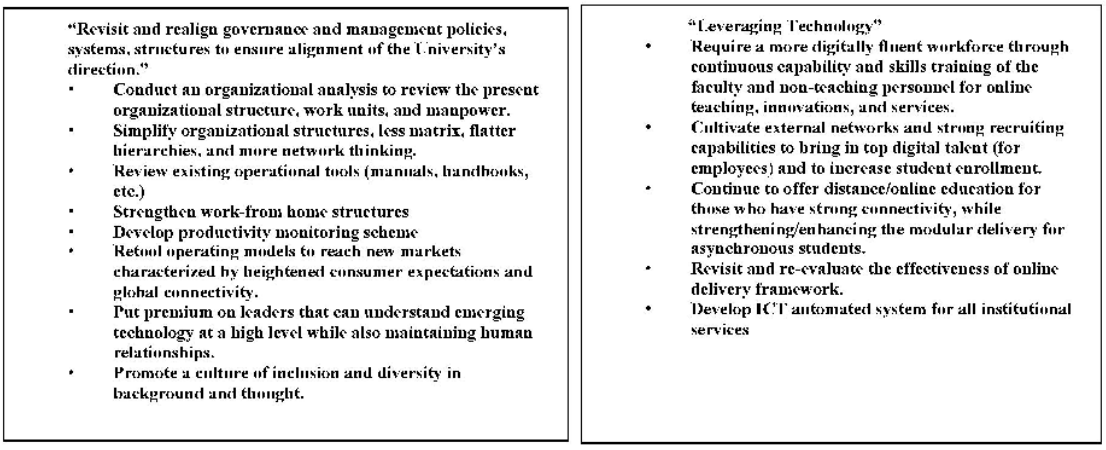

Figure 5: Examples of Strategies with Suggested Details

Seeing the commonalities of the strategies, another team was regrouped, part of the membership came from the four existing groups and joined by some members of the top management. The new team was tasked to study the common themes coming from the details of the generated strategies. Strategies that figured in at least three of the scenarios were considered in the analysis and assessment in terms of viability, not only financially but even socio-culturally. From the analysis of the documents, the broad statements of the Strategic Plan directions in terms of Goals were singularized, Strategic Priorities were further defined, and Outcome Measures were laid out as performance indicators. Figure 6 presents the outline of goals, strategic priorities, and outcome measures of the strategic plan dubbed as *Weathering the Pandemic: Our Strategic Priorities 2021-2024*, a 19-paged document that laid out in details the university's direction for the next three years.

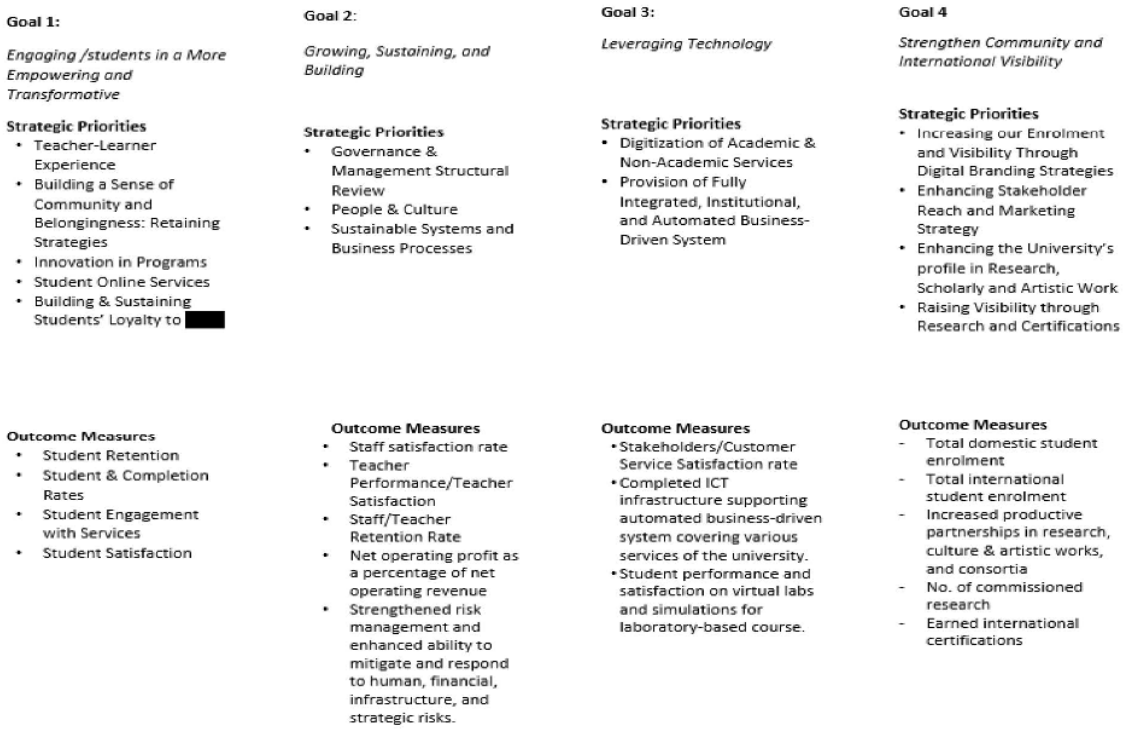

Figure 6: Outline of Goals, Strategic Priorities, and Outcome Measures of The Strategic Plan

Concluding Note

It is possible to plan even in periods of uncertainties armed with strategic foresight and scenario thinking. This paper recounted the processes involved in generating a strategic plan through 'what if' scenarios that challenged the conventional thinking that led participants appropriately to strategic thinking towards innovation. The experience validates to a great extent previous research findings that scenario planning has a positive and significant effect on strategic innovation. The experience was an opportunity for thinking out of the box and breaking molds. There were differing opinions, but dissents were always positively acknowledged. What was also prominently observed was the collegiality among the participants during the workshops and writeshops. These long traditions of collegiality, thorough and reasoned discussion with desire for consensus in universities are unique to academic orientation according to Torraco and Hoover (2005) as cited by Borbon & Cinches (2012). This culture figured in the attainment of the purpose of drafting the strategies for the university's strategic plan.

The uniqueness of this university experience may offer insight into the conditions necessary to achieve positive effects of scenario planning especially in motivating talents in allowing them to participate in decisions used to be lodged only in top and middle management. For a more strategically proactive stance, higher education institution would benefit to adapt a culture of scenario thinking to better anticipate the dramatic shifts ahead and help turn uncertainty into advantage. It encourages envisioning and planning for possible future changes that creates opportunities for innovation.

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Theme IV: Digitization & Educational Technology Innovations

Political Education Design with the Penta Helix Model in the New Normal Era

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ABSTRACT

The COVID-19 pandemic has hit the world for about two years. This is what forces humans to adapt in various sectors, including politics. One of the affected political activities is the decline in activities that require gathering large numbers of people. For example, political debate, socialization of political education and political campaigns. This study examines the political education model in the new normal era by using the Penta helix approach model. This research using a soft system approach methodology (SSM), in which the core process SSM method approach is to compare between the real conditions that exist and the model that should happen, so lead to a better understanding of conditions used as the object of research. The political education model was produced by involving the government, stakeholders, the community, academics, the media that synergize with each other in the context of political education in the new normal era by utilizing virtual media. The outputs of this article are political education design. It as public service advertisement videos, education socialization through webinars, scientific discussions, political debates and even political campaigns using virtual media.

Keywords: Political education design, Penta helix model, Virtual media, New normal era and Beginner voters

Introduction

Pandemic is a threat to every aspect of life. This also has an impact on education. In Indonesia school activities are carried out online because according to Government Regulation No. 9 of 2020 concerning large scale social restrictions (Peraturan Menteri Kesehatan Republik Indonesia No 9 Tahun 2020, 2020). The presence of Covid-19 not only changed the world of education but also all the social life order of the community, from the lower class to the elite class helped change the way of doing activities both for yourself and when interacting with the surrounding environment and many more changes that occur significantly. Even the policies issued by the government especially those related to education also changed to adjust to the needs at the time of this pandemic (ditpsd.kemdikbud.go.id, 2021). The world of education is also affected by the virus, both in terms of service to the realm of praxis which is actually the learning process so far carried out face to face in the class. Physically, but the learning process can still take place, even though there are problems that arise due to shifts from face to face to online (Dj Nurkamiden, 2021).

This also has an impact on democratic activities in Indonesia. Community involvement actively participates in the election process, both as users of the right to vote, providing political education to others, helping to monitor the implementation of elections, this is the control of the community to maintain voting rights and maintain people's sovereignty. However, in its implementation in Indonesia 2020, this is much different due to Covid-19 (Hergianasari, 2020). Political education is one of the efforts to instill democratic thinking and behaviour.

Political education aims to provide the main guidelines for the younger generation of Indonesia to be aware of the importance of national and state life based on Pancasila and the 1945 Constitution as one of the efforts to build Indonesian people (www.kemhan.go.id, 2016). Political education will produce young people who are critical of the socio-political situation that is full of conflict. In addition, political education teaches the younger generation to be able to develop all their talents and abilities which are designed in such a way that they can actualize themselves by actively participating in the political field (Anggara, 2013). So that when there is abuse of power or policy by the government, the younger generation can immediately act and criticize rationally (Ismail, 2017). Benefits of political education: First, the creation of an increasingly advanced democratic process of all individuals and their social structures. Second, real actions that are full of awareness and sensitivity in politics which can be realized in the form of participating which is shown by broad political attitudes and behaviour to jointly achieve political goals. Third, awaken and develop a political conscience, a sense of political ethics and political responsibility so as to create commendable political people. Fourth, the realization of the interests and ideology of the nation that are correlated with the security and welfare of the nation's life (Sumanto & Haryanti, 2021).

There are several challenges in higher education facing the new normal, namely challenges to realize education 4.0 (Wisnujati et al., 2021), expert thinking, communication and collaboration, creativity and innovation, as well as realizing the independent campus program that has been proclaimed by the ministry of higher education. so that innovative learning designs are needed in the new normal era (Alhumami et al., 2021). Democracy in Indonesia has not changed substantially in the midst of the COVID-19 pandemic (Pudjiastuti, 2021). In 2020, Indonesia was ranked 64th in the world in the Democracy Index released by the EIU (Economist Intelligence Unit) with a score of 6.3. In terms of ranking, Indonesia is still the same as the previous year, but the score has decreased from the previous 6.48 (voi.id/en/news, 2021). This is the lowest figure obtained by Indonesia in the last 14 years.

Gaps/aspects of higher education institutions that need to be addressed, namely political education usually appears only before the political year when elections are about to take place, and political education is usually only interpreted as an awareness of the public to participate in elections. even though political education is not just coming to the polls, but also helping to build democracy in

Indonesia, as well as digital literacy so that comments on social media do not contain elements of hate speech in discussing politics.

LITERATURE REVIEW

Political education

Political definition 1. (knowledge) about the state administration or state (such as the system of government, the basis of government); 2. all affairs and actions (policies, tactics, and so on) regarding the government of the country or against other countries; 3. how to act (in dealing with or dealing with a problem) (Budiardjo, 2007). Politics in a basic understanding is concerned with how to act in various situations. At a certain point, the political awareness of the younger generation cannot be separated from the fields of individual interest. From that interest comes awareness, and eventually becomes a valuable contribution. Political education is part of political socialization. Political awareness of citizens is a determining factor for political participation in the community. That is, the size and level of a person is said to be involved in political participation if he has knowledge and awareness of his rights and obligations in the community and political activities (Fields & Feinberg, 2001). Political awareness is a variety of knowledge, orientations, and values that form an individual's political insight, in terms of its relationship to political power. Political awareness as something that an individual has which includes political insight on various issues, institutions, and political leadership both on a regional and international scale. If we look at the various opinions in above then we will know that political awareness includes things following: a. Comprehensive view. b. Critical insight. c. Responsibility. d. The desire to change, in order to realize freedom or face various social problems.(Ahmad et al., 2019)

Political education teaches the public to be more familiar with the political system (Fatwa, 2016). It can be said that political socialization is the process of forming political attitudes and orientations of members of society. Through this process of political socialization, community members gain attitudes and orientations towards political life that takes place in society(Almond, 1990). The goals of political education are:1. Creating people (individuals, groups, clients, students, citizens society), namely: a. able to understand the socio-political situation full of conflict; b. dare to be firm in providing constructive criticism of the steady state of society; c. its activities are directed at the process of democratizing individuals or individuals, and democratizing all social institutions and state institutions; d. able to fight for certain interests and ideologies, especially those that are correlated with the security and welfare of living together (Surbakti, 1992).

Penta helix

In this 21st century world, we are often required to have many skills and abilities in order to be able to carry out various roles at one time to realize great achievements. But sometimes we forget that we humans also have limitations. Of the many demands that exist, from now on we need to realize the ability of ourselves and others so that we can synergize to complement each other in a small to large scope. To make social change, of course, we cannot do it alone. That is why collaboration between parties is important in achieving common goals by maximizing the Penta helix concept which involves multiple roles. Penta helix is a term used to describe the participation and cooperation of the five elements of development, namely government, business, academia, society, and the media. As a concept, the main one (Putri Hergianasari et al., 2022). The Penta helix concept is one way to solve problems and develop programs by involving cross-sectors to share roles. The following is the Penta helix scheme in carrying out cooperation between parties:

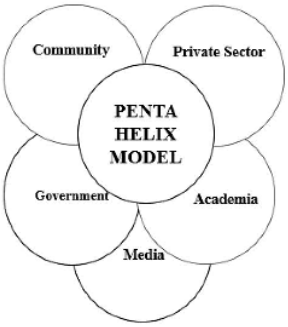

Figure 1: Penta Helix Model

The Role of Each Party:

1. Academics
   In the Penta helix concept, academics act as drafters who conduct research, assist in the management of potential identification, and development opportunities. Academics are also responsible for increasing knowledge and skills capacity because academics are a source of knowledge that includes a collection of the latest concepts, theories, and development models that are relevant to existing conditions.
2. Business
   Business in the form of an entity or business actor acts as an enabler that helps achieve goals in carrying out business processes to generate added value and maintain sustainable growth. In terms of collaboration with the Penta helix concept, businesses can play a role in providing technology infrastructure, capital, and business networks
3. Community
   The community acts as an accelerator, acting as a liaison between stakeholders to assist the community in the whole process of building social change.
4. Government
   The government has three roles at once in the Penta helix concept. First, the government acts as a regulator and controller who has regulations and responsibilities in social change. In carrying out its role, the government must always involve all types of activities, such as planning, implementation, monitoring, control, promotion, financial allocation, licensing and others. The government also acts as a coordinator for stakeholders who contribute to social change.
5. Media
   The media also plays an important role in building the brand image of the social changes that are being built in society, so that access to information is easy to obtain. With the ease of access to information, it will invite and add new collaborators to jointly create social changes that have an impact on society (Raditya, 2021).

The younger generation

The younger generation, in this case, we focus on generation Z, namely those born between 1997 and 2012. There are several versions of the year of birth of Generation Z, as the description of the previous generation, namely the millennial generation, which also has several versions of the year of birth. To be sure, Generation Z has been exposed to internet technology access since childhood. Their preferences for many things are clearly different from those of their predecessors. According to the Central Statistics Agency, the number of Generation Z in Indonesia is currently 74.93 million people. This figure is equal to 27.94%. This amount will make an important contribution if it is optimally empowered through appropriate political education.(BPS, 2022)

As we know, the millennial generation has great potential for political power because of its large number. However, this generation is less interested in participating in conventional politics for various reasons. There needs to be an easier path to access so that the millennial generation is willing to participate in politics. For example, through writing on the internet with a political theme. The millennial generation who are just learning about politics, especially in general elections, usually they learn not far from the space that is considered to give them a sense of comfort. The behaviour of the millennial generation as novice voters in democracy has characteristics that are usually unstable and apathetic. This is due to his lack of political knowledge. They tend to follow the game group because of the unstable and inconsistent spirit that the millennial generation has as a novice voter. The following are researches related to political education and pentahelix collaboration from Indonesian academics

Political Participation of the Sleman Community in the Covid-19 Pandemic Period in the context of citizenship education, the results of this study show that the political participation of the Sleman Regency community is very good in the midst of outbreaks and the functions and roles of citizenship education as political education, tested for its toughness in building political participation in the community in Pandemic period. The indicator is very good shown from the number of voters greater than the number of abstentions, which is 549,044 voters compared to 126 votes abstentions (Nurgiansah, 2021).

The Role of PKS (Partai Keadilan Sejahtera) in Political Education in the 19th Pandemi Covid in Kalidoni Palembang. The role of PKS in political education during the 19th Covid Pandemic in Kalidoni Palembang. The results of this study were found, that the forms of political education during the Covid-19 pandemic period in the Prosperous Justice Party in the DPC PKS Kalidoni District Palembang City were divided into three targets of the public, namely for individual party individuals through the political and top recruitment program (party orientation training) run during the Pandemic period to facilitate party individuals in legal and political insight, then the program aimed at party management including the Khalaqah program and political education through the webinar, finally the political education aimed at the community through the political education program of the driving mothers and the pioneers of goodness that are still carried out At the district level during the Pandemic period by applying Phsycal Distancing and BPJE (Economic Network Empowerment) which is carried out in a webinar and specifically addressed for MSME actors (Yunizar & Rochmiatun, 2021).

An article journal article with the title Implanting Moral and Character Values in the Era of a Pandemic through Education by Implementing Pancasila Values. the results of the study are the need for strengthening and education and the cultivation of Pancasila is very important for us to implement so that the formation of a generation that has moral values and quality character through online learning (Nurohmah & Dewi, 2021).

An article journal with the title Influence of The Covid-19 Pandemi on Community Political Participation in the 2020 Elections in Mande Village, Mande District. The results of this study are the Covid-19 pandemic does not affect the process of public political participation, on the contrary the Covid-19 pandemic is used by related parties in this case the government and political parties to disseminate all political activities with full obedience and awareness in carrying out campaign and election activities by using health protocols and other media so that campaign and election activities can run well, or in other words, increased political participation (Maulandari & Sulaeman, 2021).

An article journal with the title Implementation of Penta helix Collaboration Model in the Development of Government Institution's Potency as General Services Agency. This journal explains about the optimalization of 5 rules, such us: business, government/management, community, researchers and media as facilitator the strategic plan for the Public Service Agency (Wisudayati et al., 2020). The significance of this study with the research above, that this research focuses on political education in the new normal era by using the penta helix as a collaboration concept.

METHODOLOGY

This research using a soft system approach methodology (SSM), in which the core process SSM method approach is to compare between the real conditions that exist and the model that should happen, so lead to a better understanding of conditions used as the object of research. On this research was carried out through 6 stages in which we are able to provide an overview of the gap between real world with the concept should be. CATWOE is one of the techniques in stages of SSM which function as structured disclosure of problem situations. The implication is that some ideas are generated to produce improvements through a number of actions. SSM can be distinguished by several methodologies that develop in the treasures social research, whether directly labelled all-system methodology (system methodology) or not directly labelled systems methodology. Three main features of SSM are 1) understanding and analysing the situation problem; 2) analysis of relations and roles of the parties related; and 3) analysis of political relations and roles as well as social stakeholders (Mingers & Sarah, 1992).

SSM contains an explanation that logical for scientific applications divided into 7 stages as follows: Stage 1: Situation Considered Problematic, the problem that is intended is more appropriate to be called a problem situation, because generally there are more than one problem to be solved so it is necessary to identify one by one; Stage 2: Problem Situation Expressed, collecting data & information by conducting observations, interviews, workshops & discussions followed by the formulation & presentation of the problems, which are then outlined in the form of Rich picture; Stage 3: Root Definitions of Relevant Systems, relating the problem to the existing system, followed by creating root definitions that describe the process / transformation to achieve the goal (To do X, by Y, to achieve Z), to test the root definitions by doing CATWOE analysis Stage 4; Conceptual Models, create a conceptual system model for each system, the model is described with an activity model, followed by determining and measuring the model's performance (efficacy, efficiency & effectiveness); Stage 5; Comparison with Reality, comparing the conceptual model with reality and usually new ideas will arise for change; Stage 6; Debate about Change, together with stakeholders discuss the results of the previous stages, the result is change, and the change must be systematic (means and goals) and feasible to implement. Stage 7; Action to improve the problem situation.

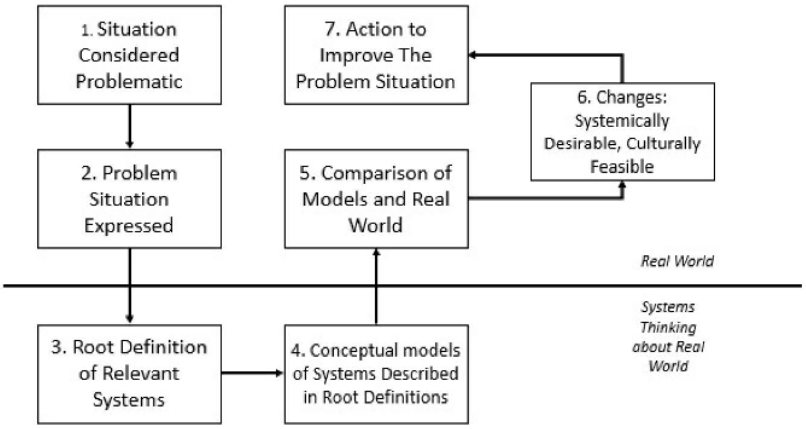

Figure 2: SSM explanation
Source: (Ebrahimi, 2021)

CATWOE emerged as a combination of intuition, real-world experience and also the desire to take into account the wisdom gained at the time in formal systems thinking that every time one of the elements was omitted, the analysis would be disrupted. The hypothesis was established that the six CATWOE elements, would be traceable in a well-formulated root definition and tested by examining various root

definitions and relating them to occurrences to find out if any elements were missing and, if so, whether their absence was significant. The elements are also compared with the 'formal system' model to establish logical connections. C=Customers the victims or beneficiaries of T, A=Actors those who do T, T=Transformation input output, W=Worldview that makes the T meaningful in context, O=Owners those with the power to stop T, E=Environmental elements outside the system which constraints are taken as given, but nevertheless (Bergvall-Kåreborn et al., 2004).

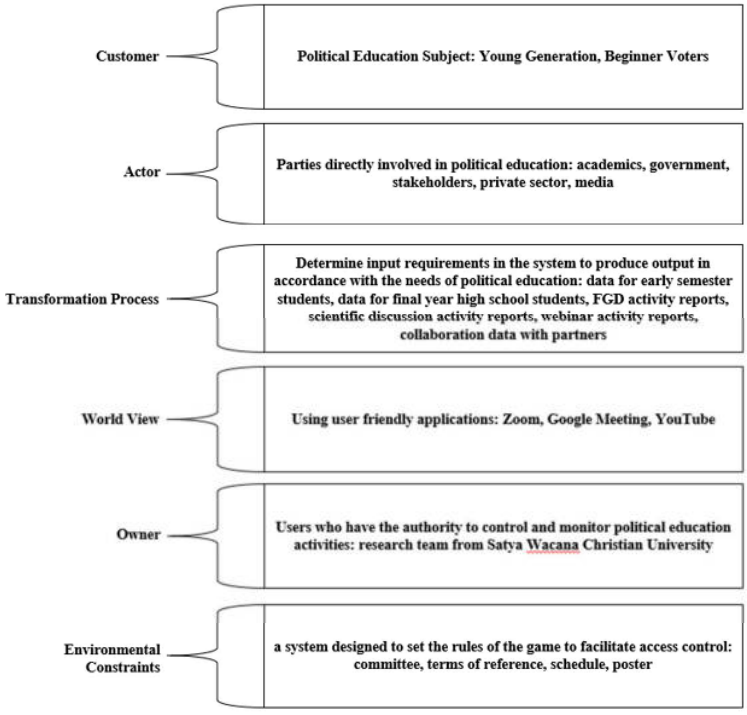

Figure 3: CATWOE Design

Result and Discussion

Humans as zoon politicon and homo education. Education is an important activity implemented as an effort to make changes to humans in improving and developing its potential as an effort to improve their abilities in preparation for facing future changes. Educational politics is a consistent attitude in terms of directing social control, regarding the goals and methods of the education system. Society is always changing. Therefore, the social system is always changing. Because the education system is an element in the social system, the education system is always changing. Therein lies the political task of education. National education functions to develop capabilities and shape the character and civilization of a dignified nation. All activities of educational institutions lead to the achievement of the goal of educating the nation's life, having character, being healthy, knowledgeable, capable, creative, and independent as a democratic and responsible citizen (UU RI No 20 Tahun 2003, 2003). Education is a human right, the key to sustainable development, and domestic peace and stability. Education must also be protected and fulfilled by the state. In a democratic system everyone must participate in political decision-making, but the educational process does not prepare the professional class for such participation activities.

Instilling political values into society on an ongoing basis. With political education, it can provide a broad perspective to the community so that later they can play an active role in the democratization process. With the existence of political education to the community, it is hoped that they will understand about democratic values, about the existing political system so that they will not be easily promised

something (Labolo, 2014). Political education that has been maximized, the results will be directly proportional to the quality of democracy, of course it cannot be separated from the cooperation of election supervisors with stakeholders (Kartisa, 2020). Good and continuous education will later shape the political personality of the community. So that they will act as political subjects, not only political objects whose voices are only expected. Forms of political education: a. Reading materials such as newspapers, magazines, and other forms of mass publication that usually form public opinion. b. Radio and television broadcasts and films (audio visual media) c. Institutions or associations in the community such as mosques or churches where sermons are delivered, as well as formal (school) or informal educational institutions. This is the CATWOE Analysis for Political Education:

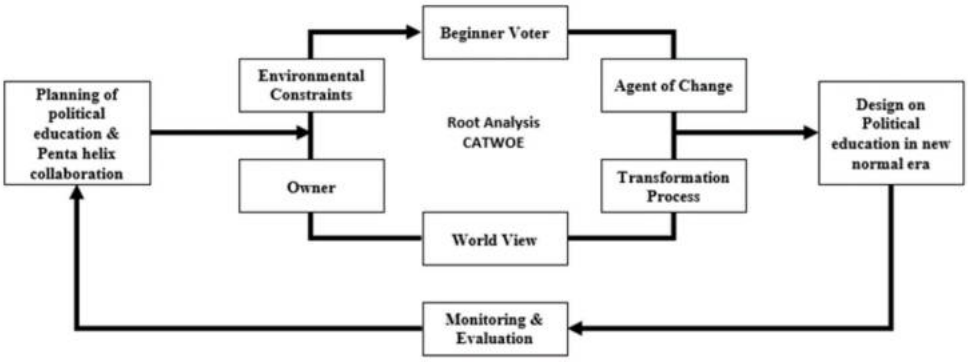

Figure 4: CATWOE Analysis for Political Education

The implementation of political education in the era and post-covid-19 has been carried out by the research team as part of academia by conducting seminars, FGDs, socialization and other forms of activity by utilizing information technology. activities are carried out online by using the media zoom meeting, google meeting. for publication of activities carried out by utilizing YouTube, whats app and poster soft files which are distributed through social media Instagram and Facebook. The activity is in collaboration with government agencies, namely the Semarang Regency General Election Commission, the Salatiga City Election Supervisory Body, and Salatiga Deputy Mayor. collaborations with the media include SWCU Public Relations, Central Java Kompas, SWCU BTSI and Bird Studio. cooperation with educational institutions, namely Nusa Cendana University, Payap University, Hang Tuah University, Pangudi Luhur Senior High School St. Vincentius Giriwoyo, Universities in Thailand. cooperation with stakeholders, namely political parties, Indonesia Corruption Watch as shown in the table.

Table 1: List of Political Education Activities

No	Method	Titles	Collaboration	Link
1	FGD	"Students International Discussion" Youth Perspective on Politics and Democracy (Religion as Political Instrument)	• Payap University • Chiang Mai University • Fathoni University • Nusa Cendana Univerity • Thammasat University • Universidade Dili	https://bit.ly/3NWmYV5
		Dialectic of Student Voices "Omnibuslaw from Student Perspective"	SWCU FISKOM Students, UGM Students	
		Identity Politics in Practical Indonesian Politics	Deputy Chairperson of the Gerindra Party	https://bit.ly/3zmm7cr
2	Socialization	Election and Party System	Election Supervisor, Election Commission	https://bit.ly/3xprrKv

No	Method	Titles	Collaboration	Link
		Corruption and Democracy: Youth Movement Against Corruption	Indonesia Corruption Watch	https://bit.ly/3az9G2j
		Democracy in Millennial Generation	PSI Party	https://bit.ly/3tnG8vd
		Socialization of Voters Education for Pangudi Luhur Senior High School St. Vincentius Giriwoyo	Pangudi Luhur Senior High School St. Vincentius Giriwoyo	https://bit.ly/3Q76wmM
3	Public Lecturer	The Importance of Political Legitimacy in Infrastructure Projects	ITB, California State University	https://bit.ly/3xoVUs2
		Paradigmatic Relations between State, Society and Market	Journalism	https://bit.ly/38ZtITs
		Democracy and Identity in Thailand	Payap University	https://bit.ly/38ZuaRE
		Governance in the Age of Information Disclosure	Deputy Mayor of Salatiga	https://bit.ly/3x9d5MZ
		General Lecture the Development of Political Theory	Hang Tuah University	https://bit.ly/3tlQZG9
		Election and Party System	General Election Commission of Semarang Regency and Pasuruan City	https://bit.ly/3xoXGJI
		Civil Society, State and Power	Nusa Cendana University	https://bit.ly/3GXSPCr
		Strengthening Pancasila and the Spirit of Nationality in the Digital Era	Deputy for BPIP, Media Suarabaru.com, Association of Indonesian Journalists, Religious Leaders	https://bit.ly/3MpTIoC
4	Research and Socialization	Electoral Distancing: Alternative Implementation of 2020 Regional Head Elections Amid Covid-19 in Indonesia	Academics and International Relation Students Community (IRSA) UKSW	

Source: Universitas Kristen Satya Wacana, Report Activity (2020-2021)

Knowledge of politics can be learned through political parties, schools, and families. The family factor greatly influences the perspective on the political intricacies they want. One of the environmental factors is that of peers who are very influential because they can change the dominant mindset in democracy. However, the role of political parties should be prioritized in providing education about politics. Academics play an important role in helping to review data and facts in the field for decision making the role of the community to encourage behaviour change at the individual level through the creation of community-based social norms in addition to media that amplifies education and awareness.

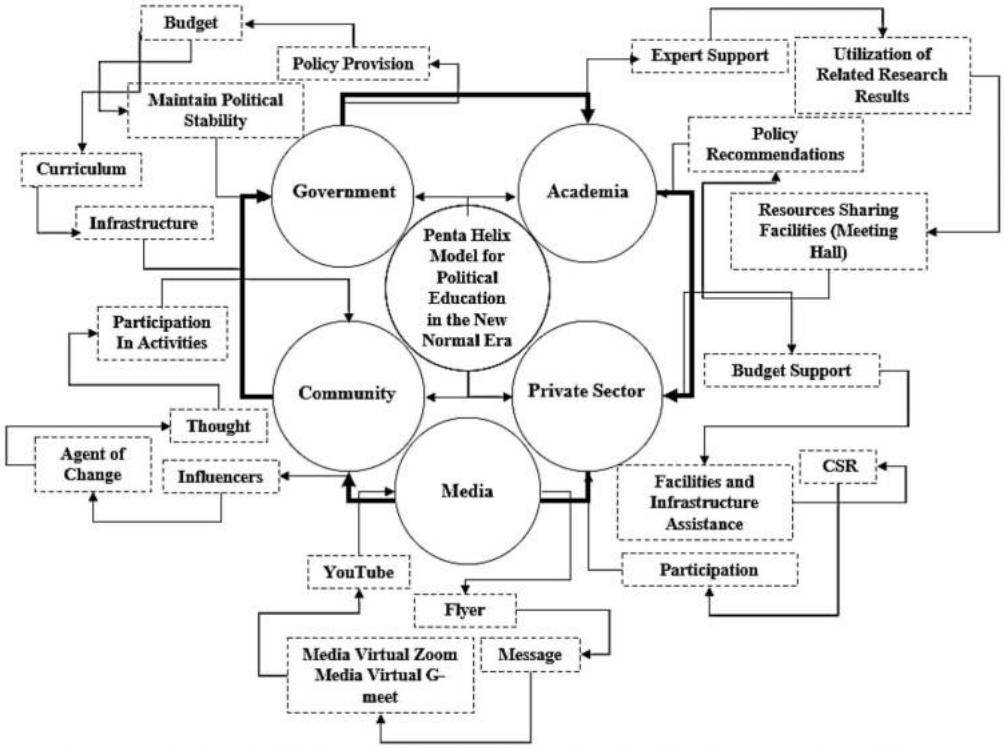

Figure 4: Penta Helix Model for Political Education int the New Normal Era

The political education program mechanism is a procedure or technique for inculcating or forming political values. The mechanism for implementing political education policies is usually standard operating procedures: 1. Facilitation of Political Education for the Young Generation, 2. Socialization of Political Assistance, 3. Website and social media, 4. Election socialization, 5. Inter-Agency Coordination. Not only recommending a policy in the political education curriculum, the important role of educational institutions in political education is as follows

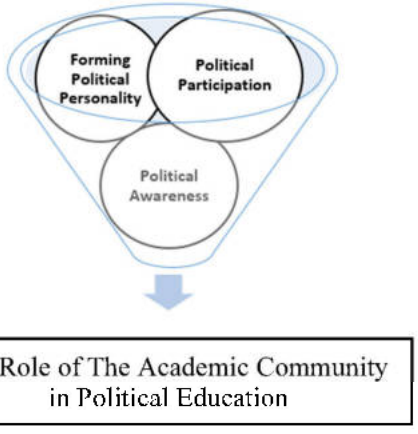

Figure 5. The Role of the Academic Community

CONCLUSION

The millennial generation as one of the people or novice voters acts as control over the course of politics. As a process of political transformation, the meaning of millennial political participation is part of structuring the journey structure and the sustainability of democratic life in the country. Based on this, the role of political education for millennials really needs to be instilled so that the wheels of democracy can be sustainable in producing future leaders of the Indonesian nation. In any condition of the nation, politics continues to run with various strategies. It requires the cooperation of various parties. This cannot be viewed from one direction only, namely from the government to the people. In order for the younger generation to be more politically literate, there are things that are needed other than the socialization of government policies, invitations to participate, and the like. For the sake of more optimal political participation, what is important is awareness. From year to year, invitations to the younger generation to be politically literate are always massive from various circles. For example, from schools and universities, there are various programs that are educating the younger generation. The same goes for activities among themselves, for example through organizations at schools or campuses. More than just self-existence, this activity is also the beginning for a greater contribution. Say, for example, about concern for social problems that occur in society whose solutions require a political approach. Through associations of organizations within educational institutions, the younger generation can find reasons to play a role. This is politics at a fundamental stage. The effect of the results of this study is to strengthen the role and synergy of the penta helix collaboration in the democratization process in Indonesia by conducting political education for the younger generation.

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Transforming Education: Utilization of New Media as a Means of Political Participation of Beginner Voters in Indonesia

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ABSTRACT

The development of Information and Communication Technology has had a major impact on all aspects of life, including political activities. The Internet as one of these developments forms a new model of political participation for society. The involvement of young people in political participation activities is an important milestone in a democratic country. But unfortunately, so far, their interest in their participation is very minimal, and even tends to be apathetic. This research wants to show the various forms of new political participation nowadays, especially for Beginner Voters in utilizing existing information and communication technology. This study uses a qualitative approach to facilitate a more in-depth and detailed study. A descriptive study was conducted specifically to map the forms of use of social media by novice voters and their effects on political participation. There are several types of political participation by utilizing the internet, namely representative, deliberative and activist. While the form of political participation can be in the form of political education socialization, political campaigns and socio-political criticism. Media Literacy by comparing each news content is another good way for Beginner Voters to find information about political activities. Another important factor is the ethics and responsibilities that underlie citizens in carrying out political participation activities, considering that Indonesia is a legal country that has the ITE Law to regulate it.

Keywords: Political participation, New media, Beginner voters, Ethics and responsibility

INTRODUCTION

Technological developments are increasingly rapid in the 21st century, especially in the field of internet-based information technology, so the role of communication media is increasingly important. Media has become one of the main means of communication and information needs for everyone. This is in line with the discovery of media devices that internet-based, so that information becomes something which is easy to find in other parts of the world, with access via the internet regarding information, entertainment, education, politics, economics and so on (Ratnamulyani & Maksudi, 2018). Technology gives rise to new media and at the same time allows media convergence, through one medium, various presentation can be seen that are interesting to watch. Media convergence combines elements of audio, visual, animation, graphics, into a single unit that can also be used to convey messages in the communication process. This new media has the main characteristic of interconnectedness (Suryo & Aji, 2019). Millennials and generation Z as users most of the internet has a tendency to spread influence to fellow social media users in their political participation. Young people as netizens have the most tendency to influence fellow social media users in their political participation. The political participation of today's youth is more open and influenced by the social media they use.

The millennial generation has great potential for political power because of its large number. The composition of the Indonesian population based on the Central Statistics Agency for Generation Z is 27.94%, Millennial Generation is 25.87% (BPS, 2022). This generation is less interested in participating in conventional politics for various reasons. Therefore, they seek and choose more accessible paths to participate such as volunteering and consumer activists through social media. This generation is the next generation who will later become part of the nation's leaders so that their political participation in the state is very much needed. Based on the above background, what is then interesting to study is how the use of new media in the political participation of the millennial generation is. The purpose of this study was to determine the use of new media and the political participation of the millennial generation.

LITERATURE REVIEW

New Media

Social media is an online media that uses internet-based technology that supports social interaction, thus turning communication into a meaningful interactive dialogue reciprocal (Putra, 2020). In its development, social media has become important as an effective means in the political communication process, especially in the context of election campaigns that can mediate politicians with their constituents, namely between communicators and communicants remotely and massive. Therefore, through social media, communicators can carry out political communication with their supporters or constituents, namely to build or form public opinion and at the same time mobilize massive political support (Blossom, 2009).

The internet is one form of new media that can be considered the most frequently used tool as an information centre. The Internet has the ability to encode, store, manipulate and receive messages. Internet use has become more interactive and has become an area for everyone, not just a few. Everyone at this time can directly use the internet anytime and anywhere. Besides the internet is a medium that can generate an instant national or international social connection, there are several ways in which individuals get valuable interactions to make real global connections. The fact that users can now work with broadcast media material as a way of developing ideas in the public sphere (Westerman et al., 2014).

One part of the new media is the "Network Society". "Network society" is a social formation with infrastructure of groups, organizations and mass communities that confirms the initial form of the organization from all aspects (individuals, groups, organizations, and social groups). In other words, the fundamental aspect of the formation of this theory is all that has a broad relationship collectively (Dijk, 2006). The dimensions of interactivity used to clarify the media, namely:

1. Dimensional complexity of the available options. The point is how many choices the audience has in terms of information content and the time that can be used to access it.
2. Dimensions of the amount of effort that must be issued by the audience to be able to receive messages from the media concerned. The point is how to compare the activities carried out by the audience with the activities made by the media.
3. Dimension level of media response to its audience. The point is how actively a media can respond to feedback given by its audience. Media with a high level of interactivity respond to feedback given by their audiences quickly.
4. Dimensional ability to monitor users of information by the audience. Media with a high level of interactivity can unify the behavior of the audience in receiving messages, then adjust the system based on the feedback generated from the analysis.
5. Dimension of convenience in adding new information. The point is how easily the audience can participate in providing and spreading the message to other audiences. Based on the criteria, broadcast television has low interactivity, while online media has a very high level of interactivity.
6. Dimensional ability to facilitate internet communication. The point is how easily interactions that occur between audiences can occur.

In under certain conditions, media with a high level of interactivity can interact with their audiences as if they were having a direct conversation (Hendricks, 2010).

The differences between old media and new media are: First, the old media in producing content or information tends to be centralized. That is, before an information is spread, it is necessary to go through the process of gathering information by a journalist, then the news is submitted to superiors, then filtered again by the editor-in-chief who acts as the person in charge of a media. In the new media, journalists can directly write and broadcast the news that has been made. Everyone can now produce information and disseminate it through microblogging or social media. Other types of content will also go through a process that is not much different. New media provide opportunities for everyone to share information through various available platforms. Second, there is a tendency in the old media, the production and dissemination of messages as a communication process can be controlled by the state or by capitalist forces. There are many ways that can be used to control the old media both by the state and by the owners of capital. This control can be effective because the amount controlled is still limited. In the new media, the state will find it difficult to control the media and the production of information because so many people can create and disseminate information through various existing platforms. Of course, there are a number of countries that can still exercise control over new media, but the impact is that these countries may be isolated and their citizens do not have access to various information, unless that country can develop media technology that is not inferior to media technology in other countries (Fenton, 2010).

Digital media is expected to be able to provide educative information related to politics so that it is hoped that the political participation of the public or readers can increase. (Zubaidi et al., 2020). This includes the use of social media. The use of social media has also improved political communication networks, political relations and political participation people in elections. It is often we will meet during the campaign period

the politics of regional head candidates who are advancing in the competition Regional Head Election (Pilkada), as well as general candidates in presidential election.

Political Participation

In the implementation of democracy, it is not only carried out by elite political actors, such as the legislature, executive and judiciary, but also by other political actors, namely the people or citizens. Where they have a big role in it. A democratic government requires the participation of all its people to exercise control, criticism and supervision. The third generation in the development of communication media opens a new open space for citizens to take an active role as a political communicator. Not only as a recipient of information or political messages, but also as the maker of these political messages. Activities like this show the involvement of citizens in political activities or political participation. (R. A. Yanuartha & Alfirdaus, 2020)

In Heywood explained there are 3 models of participation, namely deliberative, representative and activist. The first is deliberative, which is direct participation by providing political input/suggestions. For example, doing Direct Messages directly through Social Media belonging to politicians and or government officials. Second, representative, is participation by strengthening existing democratic mechanisms. Examples include e-voting, e-petition and e-campaign. The three activists are participation in the form of community empowerment to strengthen social and/or political movements. Examples include the emergence of virtual communities and virtually initiated protest movements. (Heywood, 2013)

Beginner voters

Beginner voters consist of people who have met the requirements to vote, who are exercising their right to vote for the first time. They are usually students aged 17-21 years, but there are also other young people who will be using their right to vote in the election for the first time, namely students in the first semester and other youth groups who in the previous election period were not yet 17 years old (jdih.kemenkeu.go.id, 2003). The requirements that must be possessed by a person to be able to become a voter are: 1. Indonesian citizen who is 17 years old or older or has been married. 2. Not currently having mental/memory disturbances 3. Registered as a voter 4. Not a member of the army/police 5. Not currently being deprived of his/her voting rights 6. Registered in the Permanent Voters List 7. Especially for the Regional Head General Election of candidates Voters must be domiciled for at least 6 months in the area concerned.

METHODOLOGY

This study uses a qualitative approach to facilitate a more in-depth and detailed study. A descriptive study was conducted specifically to map the forms of use of social media by novice voters and their effects on political participation.

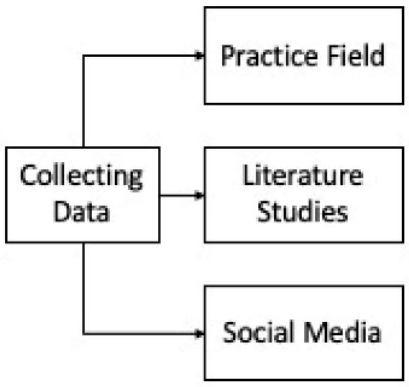

Figure 1: Collection and Data Validity

Data collection techniques using practice field, literature studies and social media. The unit of observation for this research is the use of new media as a means of political participation and the unit of research analysis is new media. The analysis technique describes the models of citizen participation in cyber-democracy. This research is aimed at novice voters who will exercise their right to vote for the first time in the 2024 General Election, which underlies their awareness of their political rights.

In this study, data were obtained from 3 sources, namely literature studies, social media and the results of student practice field. This field practice course is conducted by students from the Faculty of Social Sciences and Communication Studies at Universitas Kristen Satya Wacana for one semester at the Election Supervisory of Salatiga City, Central Java, Indonesia. Both authors are field supervisors. The results of the field lecture are educational socialization videos using social media.

RESULT AND DISCUSSION

The role of social media in the world the first politics is as a media campaign. Usual social media only used as a medium for socialize and communicate with close friends and relatives, now starting penetrated into the communication between individuals with institutions. Social media is seen as a tool for effective interaction by political parties and its candidates, including for promote their product or campaign. In fact, before the election Legislature, Political Parties are getting excited create accounts to do campaign against parties and candidates.

The examples of the use of New Media (Internet Platform) in Political Communication and Political Participation are as follows:

Socialization (Education) Model

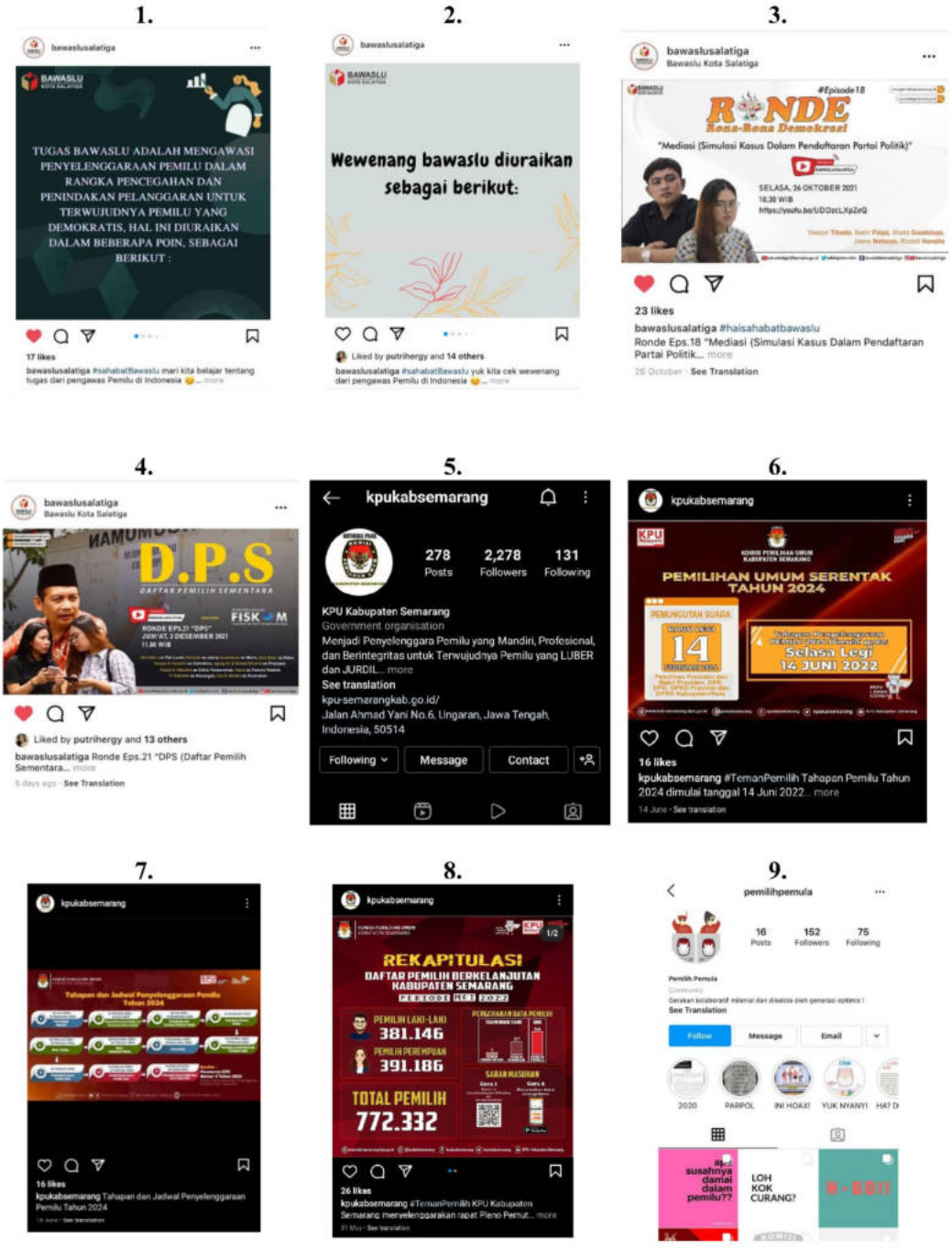

Figure 2: Utilization of Instagram Social Media by Bawaslu (Picture 1-4), KPU (Picture 5-8) and Beginner Voters (Picture 9)

Political socialization or education is a form of political participation that provides any information related to the implementation of political activities. Based on the picture above, figure 2. The use of Instagram social media by the Salatiga Election Supervisory Body (Bawaslu) which educates netizens about several things, such as the duties and authorities of Bawaslu, Mediation and Simulation of Political Party Registration and the Temporary Voter List. The use of social media by the KPU (General Election Commission) of Semarang Regency which provides information in the form of General Election timings around 2024, stages and schedule for holding the 2024 Election and Recapitulation of the Semarang Regency sustainable voter list. Utilization of Instagram social media by Beginner Voters. This Instagram provides information about political parties, hoax news and also contains narratives that lead novice voters as their communicants to understand political activities and not be apathetic towards politics, especially general elections.

The use of social media by Bawaslu and the KPU as official state-owned institutions in charge of supervising general elections and organizing elections as well as non-government actors is very important. Socialization and education using social media, apart from being a familiar medium with novice voters, can also reduce the socio-cultural impact it has. The impact is disinformation and depoliticization. In fact, social media is often used by certain parties to spread fake news for their political interests. The focus is how to use social media as a positive educational medium. So that it can dispel hoax narratives or fake news that surf freely in cyberspace. In addition, netizens must also need media literacy, namely cross-checking information, to reduce information that deviates from the truth. Another benefit is to reduce the occurrence of depoliticization or a condition that makes people indifferent to political activities, politically illiterate and unaware of their rights and obligations in political life. In Indonesia, every citizen has rights and obligations regulated in the 1945 Constitution.

Campaign Model

One of the advantages of campaigning using social media is a cost cheaper campaign. Media social is also superior because it gives opportunities for voters to have a two-way dialogue with the candidate politicians, unlike campaign models traditional direction that tends to be unidirectional. Nature political communication between candidates and prospective voters can be multi-directional, such as from candidate to voter, voter to candidates, or between voters. Existence social media can play an important role in significantly boosted sound even form opinions. The emergence of opinion, managed to form a power each candidate. Existence campaigns can appear quickly things related to movement political parties. The number of statements can participate in influencing prospective voters in determine who to choose.

Figure 3: Website Utilization by Teman Ahok in 2016 in the 2017 DKI Jakarta Regional General Election

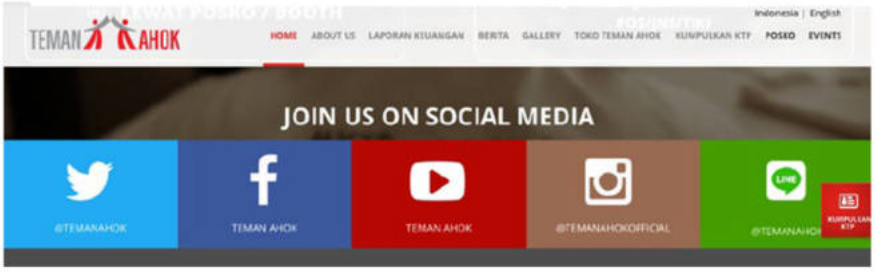

Figure 4: The Use of Several Social Media by Friends of Ahok in 2016 in the 2017 DKI Jakarta Regional General Election

For example, Teman Ahok's use of new media is shown in figures 3 and 4 above. Friends of Ahok are volunteers formed to support the political campaign process of political actor Basuki Tjahaja Purnama. This political actor is not a political party that carries it. However, Teman Ahok provides every information about the political actor Basuki Tjahaja Purnama through new media, such as websites and social media such as Twitter, Facebook, Youtube, Instagram and Line. The form above is an example of the realization of a representative participation model.

The main key in the political communication strategy in the form of a campaign is how each political figure or cadre can take advantage of the existing media, whether it is conventional media or new media in this 5.0 era of society. Each existing media has its own strengths and weaknesses. Communication strategies and making the right political messages are the determinants of achieving the right political communication as well. (R. A., Yanuartha et al., 2022)

Socio-Political Criticism Model

Socio-political criticism refers to communication that occurs in society with the intention of controlling the running of the social and political system as part of the social system itself. The media of art and literature have long been used to criticize or as a resistance to domination by the ruling elite. (Sugiwardana, 2014) The socio-political criticism model becomes a method for activists to participate in the democratization process of a country. Especially in the new media era there is the term cyberdemocracy, namely the participation of citizens in cyberspace. (Heywood, 2013)

An example of a form of socio-political criticism in cyberspace is as follows:

Figure 5: Political Messages in the Form of Memes on Facebook Accounts Political Humor, 2017

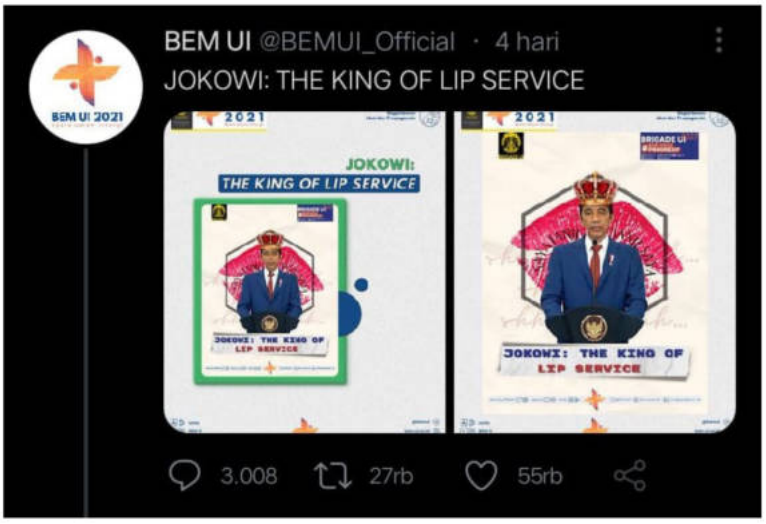

Figure 6: Instagram and Twitter BEM UI, July 2021

The picture above is a "meme" created as a form of criticism of the socio-political reality that is happening in Indonesia. Social media is a space that represents a virtual place for political activity in the digital era, by carrying out the principles or values of freedom and transparency. Memes containing messages in the style of parody, satire and criticism, can even cause anger, are one of the products of cyber-democracy. (R. A. Yanuartha & Alfirdaus, 2020) Figure 5 is political messages created by the Political Humor Facebook account, while Figure 5 is political messages created by the Instagram and Twitter accounts of BEM UI (University of Indonesia Student Executive Board).

As a democratic country, Indonesia gives freedom to every citizen to be creative and express their opinion. In addition to conventionally through representation by the House of Representatives, both Central and Regional, another form is through the products of citizens' political participation in cyberspace. In this case the participation of the activist model. In Indonesia, freedom of expression is regulated in the 1945 Constitution concerning rights and obligations, especially Article 28E paragraph

3 which stipulates that the rights of citizens and residents to associate and assemble, express thoughts orally and in writing, and so on, the conditions will be regulated in law (Undang-Undang RI No 19 Tahun 2016, 2016) . This article reflects that the Indonesian state upholds democracy, where every citizen is given freedom of opinion, including through social media.

This was then re-regulated by the State in the Electronic Transaction Information (ITE) Law (Undang-Undang RI No 19 Tahun 2016, 2016) This law stipulates that every citizen is free to create and express opinions but within the corridor the messages disseminated do not contain elements of hate speech. In addition, it is not based on objectives or can have an impact on acts of discrimination, violence, loss of life, and/or social conflict. The form of information that includes hate speech contains ethnicity, religion, race and intergroup (SARA) in the form of discrimination, humiliation, defamation, blasphemy, unpleasant acts, provocations, inciting and spreading false news. This means that there is an open space for sharing information, but it is forbidden to make information that contains hate speech.

CONCLUSION

The results of the research conducted can be concluded as follows, (1) social media has been widely used by the younger generation because on social media they can interact and communicate comfortably without having to show their personality attributes openly. They also have no problem accessing the internet, so they can connect in a very high intensity network; (2) Social media is also a source of reference for news and political information for them. If needed, or feel they need additional information, they will seek information through other media. The information obtained will then be discussed with family or friends before they make a political decision; (3) Their political participation is very low because the participants do not understand deeply that the definition of politics actually involves many things in life. The participants only associate politics with political parties and political actors, therefore they have not taken an active role in politics, both online and offline. Thus, through the political socialization (education) model, utilizing social media can add more knowledge to novice voters regarding political activities in a more comprehensive manner. This is expected to reduce the socio-cultural impact caused by disinformation and depoliticization. (4) In the process of participating, in addition to being able to utilize existing new media, to be creative in making information in this case political messages and media literacy, ethics and responsibility are also needed. Ethics and responsibilities are the basis for citizens in carrying out political participation activities. In the end, the final control is on each individual himself as a political actor. Every citizen has the right to participate in political participation. Beginner voters as citizens need to use their rights wisely and ethically and responsibly. Because the fate of our country is not entirely in the hands of state officials at this time but entirely in the hands of the novice voters as the successors of this nation.

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The development of the STIs & HIV and contraception virtual classroom (SHCVC) program on early childhood pre-service teachers

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ABSTRACT

Early childhood teachers have a close relationship between parents and children in kindergarten. When the parents have a problem such as Sexual Transmitted Infections (STIs) & Human Immunodeficiency Virus (HIV) / Acquired Immune deficiency syndrome (AIDS) and contraceptive information, they want to consult a teacher. So, the early childhood pre-service teachers' curriculum has maternal and child health programs. However, STIs, HIV/AIDS, and Contraceptive use are sensitive issues in Thailand. Contraceptives can't use and teach in some religions. Moreover, COVID-19 has caused rapid changes in social structure, including society, economy, education, and health. For education, COVID-19 made many new teaching methods specifically when we stay distanced and learn online only. For the above reason, the researcher developed the STIs & HIV and contraception virtual classroom (SHCVC) program for the COVID-19 era. This study aimed to develop and improve knowledge of the STIs & HIV and contraception virtual classroom (SHCVC) program on early childhood pre-service teachers, as well as to find an attitude toward SHCVC. This research used a quasi-experimental one-group pretest-posttest design. Participations received 6 hours (2 hours/week) of the SHCVC program. 68 early childhood pre-service teachers completed questionnaires and computer-based tests before and after the SHCVC program. The result showed that there were significant differences between the pre-test mean score and the post-test mean score in SHC knowledge, $t = 30.07$, $p < .05$. There were significant differences between the pre-test mean score and the post-test mean score in attitude toward STIs, HIV/AIDS and Contraceptive use for applying.

Keywords: STIs, HIV/AIDs, contraception, virtual classroom program, early childhood pre-service teachers

Introduction

In 2020, there were 2.7 million children aged 0-9 living with HIV, and 300,000 children were new HIV infections, aged 0-9 years old (UNICEF, 2022). In Thailand, 2.4 thousand were children living with HIV (Statista, 2022). There are many factors to increase the number of children infected with HIV. Mother to children has been identified as one of the leading factors. Moreover, some husbands gave their wife HIV&STIs and their children (Kendall and Danel, 2014) because they lack to access the information. In addition, a lot of families are convenient to talk with teachers of children more than seeking a piece of advice from physicians.

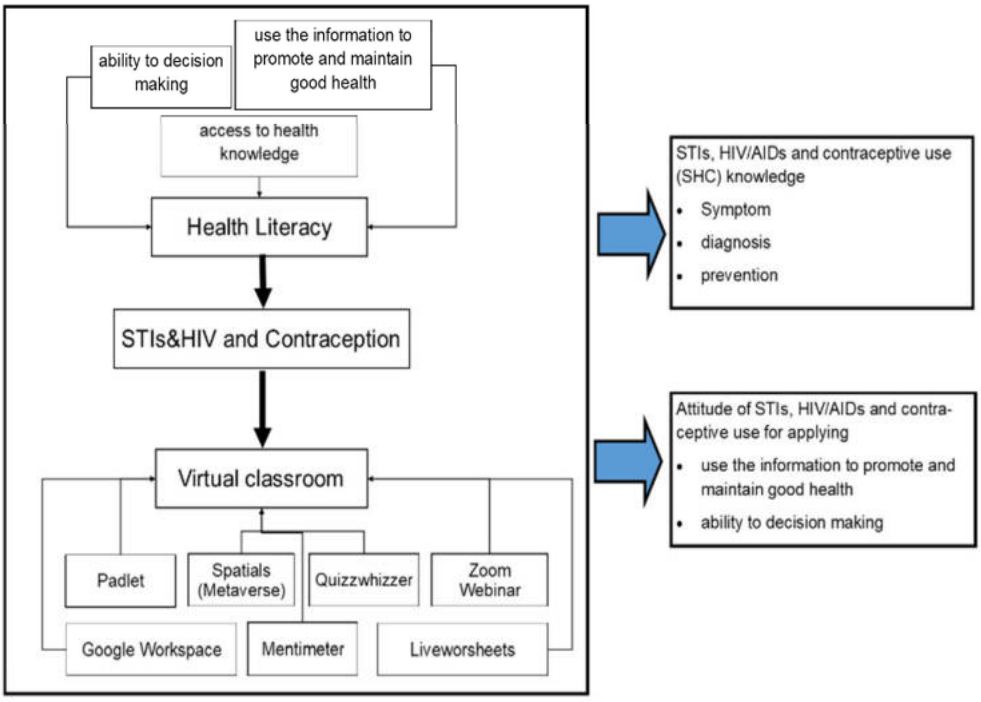
Maternal and child health programs were arranged in the curriculum of early childhood pre-service teachers which an alternative choice for families to advise or talk about their problems. STIs, HIV/AIDS, and Contraceptive use are the most important topic on this subject and sensitive issues in Thailand which is a multicultural society. Some religion believes in no contraceptive use. For that reason, researchers selected the billing ovulation method topic and add to contraceptive use for more contraceptive choices. Billing Ovulation Method was adopted by roman catholic and trained for catholic people in church (Diocese of Lafayette, 2022). So, STIs, HIV/AIDS, and Contraceptive use arrange in early childhood pre-service teachers' curricula. Pre-service teachers studied this program in the classroom.

However, in 2020-2021, Globalization and COVID-19 have caused rapid changes in social structure, including society, economy, education, and health. For education, there were many new teaching methods created to prevent the pandemic since people must keep distancing and participating in learning online. For the above reason, researchers developed the STIs & HIV and contraception virtual classroom (SHCVC) program for the COVID-19 era.

Research objective

1. To develop the STIs & HIV and contraception virtual classroom (SHCVC) program on early childhood pre-service teachers.
2. To improve knowledge of STIs, HIV/AIDS, and Contraception use among early childhood pre-service teachers.
3. To find an attitude toward STIs, HIV/AIDS, and Contraceptive use.

Research framework



STIs & HIV and contraception virtual classroom (SHCVC) program has 2 main ideas (1) Health literacy (Nutbeam, 2008) consisted of accessing and using the information to promote and maintain good health including the ability to decisions making. (2) A virtual classroom has many platforms such as Google Workspace, Zoom Webinar, Padlet, Spatials, Quizzwhizzer, Mentimeter, Liveworsheets.

Methodology

Population and samples

The population of the study was 128 students who enrolled in the Nutrition and Hygiene for Mother and Early Childhood Children Course (NHMCC) at Ramkhamhaeng University during the 2nd semester of 2021 (Academic Services and Evaluation Office RU, 2021).

The sample was 68 students recruited through the method of purposive sampling, followed by the inclusion criteria of (1) they were majoring in early childhood education, (2) they were full-time students and able to attend the STIs & HIV and contraception virtual classroom (SHCVC) program greater than 80% and (3) they were volunteer to participate in the study. The sample size was considered through G*Power, the adequate sample size should be at least 54. However, the participants who were able to attend the course as identified in the inclusion criteria were 68 students. Therefore, all those students were recruited in this study, representing 53.13% of the total population.

Instruments

This research used a quasi-experimental one-group pre-test post-test design. 68 early childhood pre-service teachers were participants. The instruments included (1) the STIs & HIV and contraception virtual classroom (SHCVC) program (2) the pretest-posttest examination for knowledge of the STIs,

HIV//AIDS, and Contraception use, and (3) the pretest-posttest examination for attitude toward STIs, HIV/AIDS, and Contraceptive use.

1. The STIs & HIV and contraception virtual classroom (SHCVC) program

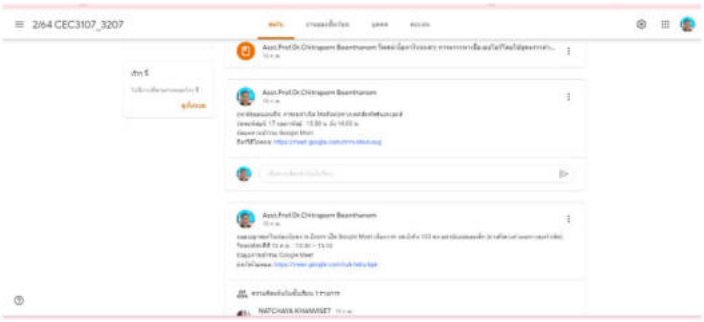
The SHCVC program consisted of an Introduction for 1 hour, HIV and AIDS education for 3 hours, and Contraceptive using skills for 1 hour. The overview of program modules is described in Table1.

Table 1: SHCVC program

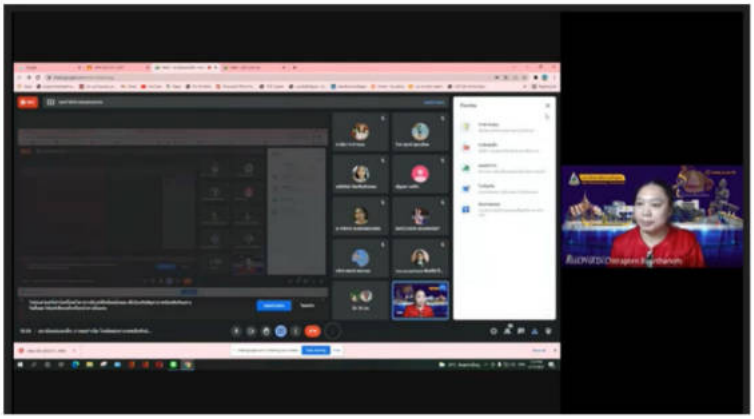
Topic	Contents	Virtual Activities	Time
Pre-test		- Google form	30 Min.
Introduction	Overview of SHCVC program and application using to learning online	- Padlet - Google workspace - Zoom webinar	1 hr.
STIs	- Epidemic - Symptom and Diagnosis - Prevention	- Live worksheet - Spatials (Metaverse)	1 hr. 30 Min.
HIV/AIDs	- Epidemic - Symptom and Diagnosis - Prevention	- Quizzwhizzer	1 hr. 30 Min.
Contraceptive use	- Family planning - Natural Contraception using the Billings ovulation method - Contraceptive Pills - IUD - Implant - Emergency Contraceptive Pills	- Google form - Padlet - Mentimeter	1 hr.
Post-test		- Google form	30 Min.

The SHCVC program was adapted using health literacy and the virtual classroom approach. Health literacy included; the ability to decisions making, access to health knowledge, and of use the information to promote and maintain good health. (Shah, Jindal & Malavika, 2022). The virtual classroom is a digital technology and digital instrument to support teaching online during COVID-pandemic. A digital interaction whiteboard, testing, and teaching online were used (Nathan, et.al. 2021). The alignment of the contents, program module, worksheets, and tests were developed by researchers and was assessed by three peer-reviewed who are a team of sexuality educators.

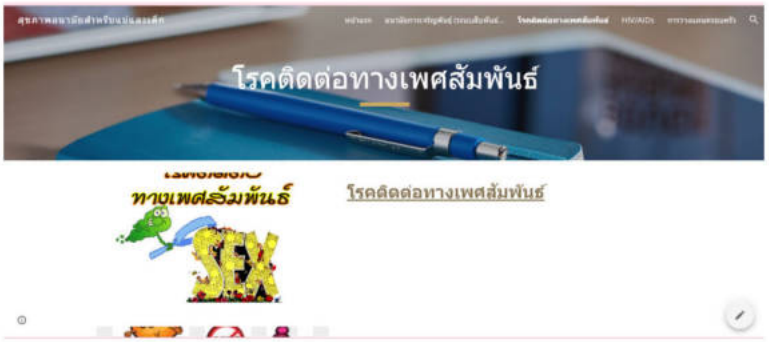
Google Workspace (Google classroom for contact students)



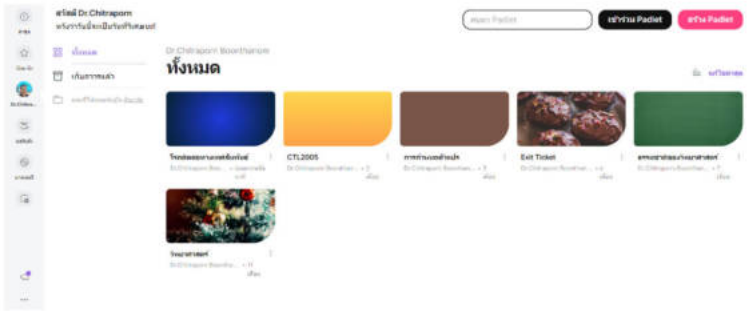
Google Workspace (Google meet for instruction)



Google Workspace (Google site for information download)



Padlet



2. The pretest-posttest examination for knowledge of STIs, HIV//AIDS, and Contraception use

The pre-test and post-test had 2 main sections. The first section included STIs, HIV//AIDS, and contraception knowledge questions developed by researchers. These questions focus on diagnosis symptoms and prevention. All items in the STIs, HIV//AIDS, and contraception knowledge questions were multiple choices tests which have 4 choices for each question.

STIs, HIV/AIDS and Contraception use online test

3. The pretest-posttest examination for attitude toward STIs, HIV/AIDS, and Contraceptive use.

The second section was the questionnaires to find an attitude toward STIs, HIV/AIDS, and Contraceptive use. Likert Scale was used in the attitude toward STIs, HIV/AIDS, and Contraceptive use questionnaires. The items were scored from 1 (disagree) to 5 (very agree). The internal consistency of the tests in this study was 78.

Procedure

The selection criteria of the intervention group included: the group was informed about the study's purpose and procedure, duration of participation and provide informed consent before the intervention, and completed questionnaires and computer-based tests before and after the SHCVC program. The group was assured of its confidentiality and was able to withdraw from the study as needed.

Data analysis

The data were analyzed by using packaged statistical program and Microsoft excel. Demographics of the participant, knowledge, and attitude were analyzed by using descriptive statistics (*mean, S.D.* and percentage). *t*-Test dependent (Pair-sample *t*-test) was used to compare Pre-test and Post-test knowledge and attitude scores.

Results

Demographic information

In this study, 68 participants (2 males and 66 females) enrolled in the Nutrition and Hygiene for Mother and Early Childhood Children Course (NHMCC) at Ramkhamhaeng University during the 2nd semester of 2021. Most of the students were 21 – 22 years old (43.3%). Their religions were 62.7% Buddhism, 29.9% Muslim, 4.5% Catholic, and 3% irreligion as presented in **Table 2.**

Table 2: Demographic information of the students

Demographic information	N (%)
Gender	
Males	2 (2.9%)
Females	66 (97.1%)
Older	
18 – 20 years old	15 (22.4%)
21 – 22 years old	29 (43.3%)
23 – 24 years old	4 (6.0%)
25 – 26 years old	4 (6.0%)
more than 26 years	15 (22.4%)
Religions	
Buddhism	43 (62.7%)
Muslim	20 (29.9%)
Catholic	3 (4.5%)
Irreligion	2 (3.0%)

STIs, HIV/AIDS, and Contraceptive use (SHC) knowledge

Knowledge of STIs and HIV/AIDS is transmission (bacteria, virus, parasites, etc.), symptoms, diagnosis, treatment, and prevention. Knowledge of contraceptive use is family planning natural contraception use, the Billings ovulation method, contraceptive pills, IUD, implant, and emergency contraceptive pills. **Table 3** shows the mean and standard deviations of participants' SHC knowledge. The SHC pre-test mean score was 3.18 and the SHC post-test mean score was 11.06 (Total score of 17). There were significant differences between the pre-test mean score and the post-test mean score in SHC knowledge, $t = 30.07$, $p < .05$.

Table 3: STIs, HIV/AIDS, and contraceptive use (SHC) knowledge

	Mean	S.D.	t	df	p-value
Pre-test	3.18	1.51	30.07	67	.00*
Post-test	11.06	2.65			

*p-value <.05

Attitude toward STIs, HIV/AIDS, and Contraceptive use

Attitude toward STIs, HIV/AIDS, and Contraceptive use is an opinion of family planning knowledge to apply in life, importance of family planning knowledge and skills, STIs and HIV knowledge to apply in life, STIs and HIV prevention to apply in life, and giving information in STI, HIV, and contraceptive for kindergarten parents. **Table 4** shows the mean and standard deviations of participants' attitudes toward STIs, HIV/AIDS, and contraceptive use for applying. The results indicated that the post-test mean scores showed higher scores than pre-test mean scores ($p < .05$) such as the attitude in using the information to promote and maintain good health consisted of families planning knowledge to apply in life pre-test mean scores was 3.32 and the post-test mean scores were 4.82, Importance of family planning knowledge and skills pre-test mean scores were 3.32 and post-test mean scores were 4.54, Family planning for quality of family pre-test mean scores were 3.25 and post-test mean scores were 4.16, STIs and HIV knowledge to apply in life pre-test mean scores were 3.25 and post-test mean scores were 3.96, STIs and HIV prevention to apply in life pre-test mean scores were 3.18 and post-test mean

scores were 3.96, Giving information in STIs, HIV/AIDs and contraceptive use for kindergarten parents pre-test mean scores were 2.44 and post-test mean scores were 3.43.

Table 4: Using the information to promote and maintain good health

Items	Pre-test Mean (S.D.)	Post-test Mean (S.D.)	t	p-value
Family planning knowledge to apply in life	3.32 (.58)	4.82 (.49)	16.63	.00*
Importance of family planning knowledge and skills	3.32 (.63)	4.54 (.74)	11.55	.00*
Family planning for quality of family	3.25 (.68)	4.16 (.77)	7.85	.00*
STIs and HIV knowledge to apply in life	3.25 (.68)	3.96 (.68)	6.45	.00*
STIs and HIV prevention to apply in life	3.18 (.71)	3.96 (.70)	6.21	.00*
Giving information on STI, HIV, and contraceptives for kindergarten parents	2.44 (.56)	3.43 (.68)	9.14	.00*

*p-value <.05

There were significant differences between the pre-test mean score and the post-test mean score in Using the information to promote and maintain good health.

The attitude in the ability to decision making is a planning stage to decide on contraceptive use and choose family planning or contraception method. The ability to choose contraceptives for life's pre-test mean scores were 3.24 and the post-test mean scores were 3.96. There were significant differences between the pre-test mean score and the post-test mean score in the attitude of ability to decision making; $t = 5.74$, $p < .05$ as in **Table 5**.

Table 5: Ability to decision making

Items	Pre-test Mean (S.D.)	Post-test Mean (S.D.)	t	p-value
ability to choose contraceptives for life	3.24 (.69)	3.96 (.70)	5.74	.00*

*p-value <.05

Conclusion and Recommendations

The STIs & HIV and contraception virtual classroom (SHCVC) program that developed during the COVID-19 pandemic can improve STIs, HIV//AIDS knowledge in diagnosis symptoms and prevention for early childhood pre-service teachers. The program effectively changes the knowledge and attitude toward using contraceptives. In addition, the program helps to decide to choose a contraceptive. Moreover, the SHCVC program can increase the information used to promote and maintain good health.

In any learning situation like COVID-19 situations, teachers can create a virtual classroom program for students to learn anywhere and anytime.

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Use of Technology-Enabled Teaching-Learning among Library and Information Science (LIS) Faculty in a Private University

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ABSTRACT

This descriptive research study determined the technology-enabled teaching-Learning among LIS faculty at the University of San Agustin, Iloilo City, Philippines, who were categorized as to sex, age, the status of employment, and number of years in the University. This study ascertained their level of competence in using a technology-enabled learning environment in terms of access to and use of information and communication technologies, Internet access, use of ICTs, and use of online courses and resources provided by the University. The researchers used the Commonwealth of Learning (2016) questionnaire administered through Google form and applied appropriate statistical tools to analyze and interpret data. Results showed that the number of male and female LIS faculty is the same. The majority were between 36 to 40 years old, regular and full-time, and had been in the University for more than ten years. Regarding technology-enabled learning competencies, LIS faculty have computer desktops, personal laptops, and smartphones and have access to computers in the University for teaching and learning purposes. They have Internet access at home. They access their laptops and smartphones at home and school. Regarding Internet usage, the majority spent an average of five hours daily. Regarding the use of a technology-based learning environment, the majority agreed that TEL helps them deliver their lessons efficiently and effectively, students understand the subject matter better, helps them explore many unfamiliar topics, create multimedia as part of their teaching, and downloads their lecture audio-visual recordings.

Keywords: Technology-enabled learning, library and information science faculty, information and communication technologies

Introduction

Technology has significantly impacted the field of education in the last decades. More and more universities spend a portion of their budgets on computer purchases in classrooms. Now, technology has enhanced in-depth learning based on some studies. Technological discoveries have improved education as well as other help achieve other university goals like professional development among the faculty and staff, among others.

Motamedi (2009), in "The Impact of Technology on Education: Issues and Concerns," underscores that in today's classrooms, the use of technology seems to be a growing trend. This use of technology is a trend that presents several challenges to both administrators and teachers. Technology is an increasingly popular activity in American classrooms. Students can learn from technology, and they can learn with technology. Technology was introduced in schools because it is believed to positively affect teaching and learning (Reeves, 2006).

Now that technology has become more sophisticated, its cost per unit has decreased, and its accessibility increased as an instructional tool in classrooms. Undeniably, Motamedi asserts that conventional wisdom indicates that children will grow up to inherit a world that is linked with technology. Hence, they must be familiar with it. Thus, this has become a challenge for schools to procure the latest hardware and software for classroom use. Training teachers in the use of technology is practical. The goal must be to improve education with the use of technology.

A review of the recent research literature relating to the impact of digital technologies on teaching and learning has been done. While the relevant studies cited in this review give insight into how technology integration influences teaching and learning, a complete picture of its efficacy cannot be drawn without a substantial inter-connected body of rigorous research.

In another study, Al-Bataineh, Anderson, Toledo, & Wellinski (2008), in "A study of technology integration in the classroom," describe a lot of pros and cons of integrating technology into the classroom. The team conducted a study on implementation and integration into the classroom. They found that email and electronic grade books were the highest use of technology and the lowest used technology as an instructional devices.

In like manner, Alansari (2006), in "Implementation of cooperative learning in the center for community service and continuing education at Kuwait University," discusses the benefits and achievements obtained by students in cooperative learning groups as opposed to those who were not. The article is based on adult learners, but they are students in a school setting.

Alexander (2004), in "Going nomadic: Mobile learning in higher education," reviews how several campuses handle the new opportunities and challenges that mobile technology has brought to the inside and outside of the classroom. It recognizes the difficulty this technology has on the pedagogical practices in academics. The article looks at several examples and concludes that pedagogies are changing regarding mobile technology, much like other technologies. It also states that, to some extent, this technology will drive social practices and, thus, breakthroughs and changes in education. The paper provided accurate world information that can easily relate to many situations.

Technology-enabled learning (TEL, in some parts of this study) describes the use of technology, systems, platforms, and digital content to extend and enhance student-centered learning. TEL can also refer to applying digital technology to teaching or learning in an educational context. It is unnecessary to argue whether the learning context can be considered formal, non-formal, or informal. Following the development of the Internet in the 1980s and the inception of the World Wide Web in 1995, there has been considerable growth in the adoption of technology within educational institutions, for both

distance and on-campus teaching and learning. The adoption of technologies has now spread to almost all parts of the world (Kirkwood & Price, 2016).

Some of the potential benefits in adopting TEL, it increases flexibility for teachers in terms of where and when they undertake their teaching and assessment activities and also Providing opportunities for students to access books, journal articles and other resources (texts, sound recordings, still and moving pictures) in digital format from a variety of sources and locations.

COVID-19 has dramatically affected the global educational system, not only in the Philippines. According to UNESCO, the pandemic affected more than 1.5 billion students, and the youth with the most vulnerable learners were hit hardest. As not to affect the delivery of instructions, the University of San Agustin adopted the use of TEL by implementing the NEO learning management system in the University.

The National Competency: Based Standards for Filipino Librarians (2015) suggested that librarians need to gain a core technical competency to contribute to the effectiveness of the operations of the organization. Therefore, librarians teaching in LIS are expected to be technology competent not only in the library operation but also in teaching and learning applications especially that they are dealing with millennials students who are known as tech savvy and computer natives.

Thus, this research was conducted to determine the LIS faculty's competence in using a technology-enabled learning environment in terms of access to and use of information and communication technologies, Internet access, use of ICTs, and use of online courses and resources provided by the University.

Statement of the Problem

This study determined the LIS faculty's competence in using technology-enabled learning. Specifically, this study sought to address the following questions:

1. What are the faculty's characteristics in terms of gender, age, the status of employment, and the number of years in the University?
2. What is the technology-enabled learning environment regarding Access to and Use of Information and Communication Technologies, Internet Access, and Perceptions of LIS Faculty in the Use of a Technology-Based Learning Environment?

Technology-Enabled Learning Theories

A wide array of theories can serve as a grounding for technology-based teaching and learning. Dr. Joan Hughes developed the RAT Model. This allows teachers to self-assess their integration of technology in the classroom. According to the RAT Model, digital technology can replace, amplify, or transform the classroom.

Replacement refers to using technology that in no way changes instructional practices. Technology is simply a different means to the same instructional end.

Amplification is when the task remains fundamentally the same, but technology increases efficiency, effectiveness, and productivity.

Transformation occurs when technology "reinvents aspects of instruction, learning, or curriculum in new and inventive ways."

While all these categories may be used, amplification and transformation are more effective than replacement. Teachers are often encouraged to use the RAT Model to reflect on and assess their use of technology in the classroom.

Another relevant theory is online collaborative learning (OCL). This illustrates that students engage in collaborative processes in the online delivery of the lesson and facilitated by the instructor. Students then can explore the different learning strategies like brainstorming, comparing, and analyzing their ideas to manage the teaching-learning engagement. The teacher only serves as the facilitator and assists students' needs during the class.

Another relevant and essential theoretical grounding is the TPaCK Theory. This theory is otherwise termed Technological Pedagogical Content Knowledge. This theory is a technology integration framework and identifies three types of knowledge such as technological, pedagogical, and content knowledge. This framework is for students to be prepared to face the technology-driven world. This theory can facilitate the integration of technology, content, and pedagogy. A blending of all these components is the key to success. Santos & Castro (2021) utilized Technological Pedagogical Content Knowledge (TPACK) to determine the effectiveness of the lesson delivery with technology integration. They assert that it is an ideal application in all aspects of learning, which are essential in teaching and learning. Technology in the 21st century plays a significant role as a tool in helping the teachers in the delivery of lessons and students in learning which completes the model of PCK, and this is Technology, Pedagogy Content Knowledge (TPACK). Context is also important in educational research and the technological pedagogical content knowledge (TPACK) framework.

This theory explains a set of knowledge that teachers need to teach their students, teach them effectively, and use technology. It also attempts to identify the knowledge required by teachers for technology integration in their teaching while addressing the complex, multifaceted and situated nature of teacher knowledge. This framework extends Shulman's idea in 1986 of Pedagogical Content Knowledge in the study of Koehler & Mishra (2006 as cited by Valtonen et al., 2020).

Figure 1: *The TPaCK Framework*

(Source: TPack.Org @ https://www.powerschool.com/blog/the-tpack-framework-explained-with-classroom-examples/)

Significance of the Study

The results may be beneficial to the following:

Administrators. This study may provide initial data to administrators to provide Technology-enabled learning facilities and services to the university in general and BLIS program in particular.

BLIS Faculty. The findings will form the basis from which teachers can further improve their delivery of instruction through full implementation of TEL. This will also help them realize the importance of having competence in the use of technology in teaching and being able to use it appropriately.

BLIS Students. The findings will serve as baseline to LIS students of the importance of TEL in their academic endeavor.

Future Researchers. This study will be of help to those who would like to undertake similar research.

Research Methodology

This descriptive research study determined the technology-enabled learning among LIS faculty at the University of San Agustin, Iloilo City, Philippines. The researchers used but modified the Commonwealth of Learning (2016) questionnaire. The primary aim of this questionnaire is to assess the Technology-enabled Learning environment as well as the enabling policies that include access to media and technology. This instrument also includes the nature of use and preferences for the adoption of technology for learning in an educational institution.

The Questionnaire on Use of Technology is originally for learners but in this study, it was administered to all the LIS faculty in the University through Google form and followed up with a one-on-one interview to substantiate the data derived from the Google forms. Descriptive statistics were utilized. No inferential statistics were further used in this study as the LIS faculty are few in number.

The research instrument three parts. Part A includes the background information of the participants who are the LIS teachers with 10 items. Part B is Access to the Use of Information and Communication Technologies (ICTs) with 7 main questions but broken down into several sub-questions. Part C includes Perceptions of Use of Technology-Enabled Learning with 3 main questions but with 37 sub-questions.

Research Participants

The research participants included the LIS faculty in the University of San Agustin. Their gender, age, status of employment, and number of years employed were also taken into consideration.

Results and Discussions

Respondents Personal Characteristics in terms of Gender, Age, Status of Employment, and Number of years

Results showed that there are several males and female LIS faculty. The majority were between 36 to 40 years old, regular and full-time, and had been in the University for more than ten years.

In an academic institution, employees should not be viewed as an expense but as the company's assets. Librarians are much more invested in their jobs and the workplace if they feel valued by their employers, like paying them higher salaries. This is a way to show librarians that they are valued in exchange for a higher quality of work and higher levels of productivity.

Technology-Enabled Learning Environment in terms of Information And Communication Technologies, Internet Access, Perceptions of LIS Faculty in the Use of Technology-Based Learning Environment

a. Access to and Use of Information and Communication Technologies (ICTs)

Results revealed that in terms of technology-enabled learning competencies, LIS faculty have access to computer desktops, personal laptops, and smartphones and have access to computers in the University for teaching and learning purposes. ICT provides the help and complementary support for both the teachers and students. Such involves effective learning with the help of the computers to serve the purpose of learning aids (Jorge et al., 2003).

Results further revealed that 100% of the LIS faculty has complete access to the use of information and communication technologies. Also, peer mentoring in the use of TEL to improve teaching was also feasible in the LIS program. Aside from that, whenever there is a problem with any of the technology devices that are being used in the University, the Communication and Information Support System (CISS) of the University is ready 24/7 to address and troubleshoot wherever and whenever its services are needed.

Aside from that, access and use of ICT tools in the University are made available to all LIS faculty. Whenever they opt to use the University's facilities, these are available too at any time.

b. Internet Access

LIS faculty members have their Internet access at home. They access their laptops and smartphones both at home and at school. In terms of Internet usage, most of them spend an average of five hours daily.

Because teaching is done online, it is observed that a LIS faculty spends more than 5 hours of internet time daily. The majority conducts classes, checks students' assessments such as assignments, library research, quizzes, projects, reporting, etc. Also, conducts correspondence, provides feedbacks and students performance, answer queries, answer students emails, research and communicates with the community.

The Internet provides technology-based teaching and learning in various exciting ways, which include stimulation, storage of data, educational videos, the usage of databases, mind-mapping, guided discovery, brainstorming, music, and the World Wide Web (www). These will make the learning process more fulfilling and meaningful (Finger & Trinidad, 2002).

c. Perceptions of LIS Faculty in the Use of Technology-Based Learning Environment

Results showed that most agreed that TEL helps them deliver their lessons efficiently and effectively. Students understand the subject matter better, which helps them explore many unfamiliar topics, create multimedia as part of their teaching, and download their lecture audio-visual recordings.

It is a reality that in educational institutions, TEL has shifted from traditional teaching and learning practices. From what has been gathered from the LIS teachers' responses, it is clear that with TEL, they could deliver their lessons more efficiently. Studies point to the fact that technology is only successful in the teaching-learning process if it is interactive, employs a real-time feedbacking scheme, and allows

students to use their creativity in doing their tasks and assessments online and millennials understand their lesson better with the use of TEL.

The LIS teachers also highlighted that they were able to explore many unfamiliar topics and explore various applications to enhance their teaching-learning encounters. In this modality, one teacher said that she is not just teaching, creating tests, and correcting papers, but as a teacher, she goes beyond the usual things that she did before the pandemic. She now makes sure she goes the extra mile to support student learning through various learning tasks to deepen student learning. Most of all, she always makes sure she gives honest time feedback.

One LIS teacher shared that even though she was not techy before, she taught herself, conducted self-learning, and downloaded materials from online sources to enhance her technology skills. Her concern, she said, is how to tailor her content to technology requirements.

Another LIS teacher shared that her exploration of technology tools led her to presentation software like the Canva. In this platform, presentations were channeled to another level. Slides, diagrams, videos, photos, and a lot more were presented and manipulated in many ways that she had not imagined before.

Online collaboration through the different Google applications, document sharing, Google meet, Google classroom, Jam board, and slides, among others, have been maximized and have aided the teaching-learning process.

It is a reality, however, that TEL-based learning can pose many challenges. LIS teachers observed that power interruptions, slow connectivity, internet availability, and many student-related factors could also hinder a successful TEL delivery.

Implications for Theory and Practice

There is a saying that a day will come when technology will replace teachers in the future. This statement is not valid. In an analysis conducted by McKinsey & Company (2016), it was reported that teaching is one of the least likely professions to be automated. In this context, technology is used effectively to enhance learning. It also has the power to transform the interactions between students and teachers, and enhance the learning (and educating) experience. The use of technology and VLE data generated will empower teachers all over the world. This they can do by making better teaching decisions for themselves and their students' learning outcomes.

Technology may significantly influence online course management, sophisticated AIs to analyze student performance and behavior, and create paradigms to help teachers generate data (big data contribution) to facilitate assessment, improved lesson delivery, and solutions to gaps in learning.

Conclusion

The LIS Faculty of the University of San Agustin can access and use TEL at their home and at the University with the use of their laptop and smartphone. They find TEL very useful to their teaching and learning process because they can deliver their lessons efficiently and effectively. Also, with the use of TEL, students understand the subject matter better, improving their academic performance. Thus, TEL is beneficial both for the students and faculty,

Recommendations

1. The University should continue to upgrade the TEL facilities to enhance and sustain the teaching and learning processes.
2. The Administrators should have provision of providing facilities and equipment for TEL to improve the delivery of instructions
3. The teachers should maximize the use of TEL to increase productivity in learning.
4. The teacher should use TEL to support students for lifelong learning.
5. Provision of ICTs both for teachers and students must have to be included in the budget, specifically those facilities that are available in the university.

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Digital Inclusion among educators: An examination of salience in Public and Private Schools within Metro Manila

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ABSTRACT

This research explores the online and offline characteristics of educational workers and ascertains whether digital inequality is evident in their skills, use, and the outcome in online activities. This study extends the Internet skills framework of Van Deursen et al. (2017) by examining the same parameters in the local educational settings and by incorporating the use of devices and its ramifications to the digital inclusion and exclusion literature. Online skills of educators (n=212) in both private and public institutions of learning within Metro Manila are elicited during the tail end of the pandemic wherein their online presence is essential. The respondents are selected through convenience sampling. The research locale is strategic since access to the internet is assured to represent the "have access" group. The model's association and impact are validated using partial least square regression to the data obtained. The test revealed that Internet skills affect educational usage in varying degrees with the latter affecting the offline outcome positively. The results provide evidence that online skills have educational consequences contributing to digital inclusion and/or exclusion.

Keywords: Digital Inequality, Digital Inclusion, Educational Technology Innovation,

Introduction

The information age is centered on the unprecedented growth of mobile technology and Internet access. During the late period of the 20th century, only a few percent of the world's population were Internet users (Internet World Stats, 2019) or owners of cellular phones (Roser et al., 2015). The advent of 3G networks in the 1990s gave rise to smartphones which can navigate the Internet seamlessly and these fusions revolutionize information production and usage which sets the stage of what the 21st century will be (Jackson, 2010, International Telecommunication Union, 2021).

The exponential growth of digital information is the backbone of modern economies and what emerging economies are aspiring for (Silver, 2019). This phenomenon is also a petri dish in which the digital equivalent of societal issues such as addiction (Parasuraman et al., 2017, Wallace, 2016) and inequality can be observed. Research on digital inequality revolves around how various social groupings access technologies and how its use contributes to a positive or negative impact in their life (Chen, 2013). The Internet is founded on the design principles of openness, access, and end-to-end which are the cornerstone for its pervasiveness and ubiquity (Krasner, 1983). The World Wide Web (or the Web) is a subset of the Internet that retrieves a vast array of interconnected hypermedia and documents. The sources and providers of these mediums, as well as the Internet infrastructure it operates on, are designed to "bring people together and make knowledge freely available" (Contractfortheweb, 2019). Even with a common digital agenda, differences in the culture, practice, restriction, geography (among the many variables) will provide different outcomes for different people. These outcomes (or results) are necessary to understand how the access to the web and the use of the internet contributes to improving one's life in terms of economic, cultural, social, and personal measures from which the evidence of digital inequalities or inclusion are present.

Digital inclusivity or inclusion pertains to the activities and abilities of individuals and groups to have access to and use of information and communication technologies (OCLC, 2011) as opposed to digital inequality or digital divide defined by Organisation for Economic Co-operation and Development (OECD) as the chasm between "individuals, households, businesses and geographic areas of different socio-economic levels with regard to both their opportunities to access information and communication technologies and to their use of the Internet for a wide variety of activities" (OECD, 2001).

Theoretical Background and Review of the Literature

There are three (3) levels of digital divide with the first centering on the individuals' access to Internet infrastructure, the second level pertaining to the skills and usage patterns, and the third focusing on the tangible outcomes achieved from the use of the Internet (Van Deursen et al., 2017). Extant literature on the first-level digital divide focuses on the access and the use of the internet and its impact on the economy, education, and the society at large (e.g., OCLC, 2011, Lee et al., 2015, Steele, 2019, Van Deursen & Van Dijk, 2019).

As presented by Van Deursen et al. (2015), there are two theoretical underpinnings in studies about digital inequality's enduring outcomes. First is the *normalization* hypothesis which posits that resources drops down from people with high status to those with low status; and the *stratification* hypothesis which suggest that the existing social inequalities are replicated in the use of the Internet because the medium itself replicate the offline structure; and that the human capital offline (in the actual) are carried over to the online world.

There are two important mechanisms in the stratification hypothesis. First is the amplification law which suggests that the Internet magnifies the existing social stratification or categorization. In short, when inequality in society is up, the Internet reinforces this situation. The second mechanism in the

stratification hypothesis is the power law which is a statistical law that suggests groupings between the increasing use of high-quality devices in increasing varied purposes and the increasing use of low-quality devices which will be slow for the same purposes because of the device's performance. Concisely, the Internet delivers more when one's capacity is greater which leads to the widening gap between the have and the have nots (Helsper, 2012).

Common digital inequalities are observed in gender studies, social settings, and universal access (ITU, 2019). Often, digital inequalities are attributed to education, income levels, geographical restrictions, digital literacy, and motivation and general interest in computers and the Internet as its main causes (Hilbert, 2010, Wilson, 2004). Digital inequality impacts the economy (Guillen & Suárez, 2005), education (Hilbert, 2011), society in general (Steele, 2019) and varies among different nations (Fox, n.d.).

From its original economic, cultural, and social domain, the theory of capital based on Pierre Bourdieu's seminal work in 1986 that is influential in the sociology of education (Kingston, 2001) are adjusted to include personal characteristics as its fourth domain of exclusion in the digital world (Helsper, 2012). According to Van Deursen et al. (2015), economic capital is the resources that provide the opportunity to acquire income, jobs, and wealth. Indicators such as income, employment, financial assets, and education are related to capital and wealth which when measured, will provide evidence to its contribution to the presence or absence of digital divide.

Operationalizing personal resources such as interest, aptitude, IQ, well-being (psychological and physical) constitutes the personal capital that is theorized in structuration theory of Anthony Giddens who argues that an "individual's autonomy is influenced by structure" and that "structures are maintained and adapted through the exercise of agency" (Gibbs, 2017). According to Helsper (2012), these four domains are conceptually and empirically separate but in practice interrelate because of the power structures that concentrate an advantage or disadvantage in a certain individual or group of individuals. In the world of work for example, those who have rich social capital (contacts) are more likely to have a rewarding job (which are translated into a higher economic capital) than individuals who have limited social capital.

The examination of the multi-faceted factors that involves motivation (the attitude and motives for (not) using the internet, access (the quality, quantity, and ubiquity of digital media), skills (referring to the medium itself and content-related elements of the medium), and use (the engagement with and the creation of digital content) are the second-level digital divide that is reported by some of the landmark researches (e.g., DiMaggio et al., 2004, Hargittai & Hinnant, 2008, Lee et al., 2015, Robinson et al., 2015, Van Deursen & Van Dijk, 2015).

One of the areas that is generating limited information is the study of the third-level digital divide which highlights the benefits that one gets resulting from the use of the internet and how the user benefits in accordance with a wide-ranging real-life, offline, or actual outcome (Van Deursen & Helsper, 2015). The Philippines, with almost 58 million internet users is one of the nations with the highest mobile phone subscriptions in 2019 (Roser et al., 2019). It is touted as the current social media capital of the world with 78.5 million users in 2020 and is projected to have 91 million users in the year 2026 (Statista, 2021). Despite this distinction, the Philippines is still grappling with a very significant digital divide as reported by the National Economic Development Authority and the World Bank (World Bank, 2020, Conoza, 2021). This study will extend the Internet skills framework of Van Deursen et al. (2017) by examining the same in the local perspective and by incorporating and identifying the use of devices and its contribution to the digital inequality literature among the educational workers.

Conceptual Framework

This study's encompassing goal is to examine the widening chasm between the digital have and the digital have-nots that are exacerbated during the pandemic that impacts most institutions and enterprises severely (ADB, 2020). It examines how Internet skills affect Internet usage, and the tangible outcomes of individuals by posing the central question of "How does Internet skill affect the use and creation of educational content and its resulting online or real-life outcomes?" summarized in Figure 1.

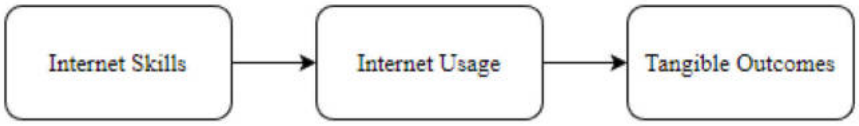

Figure 1: Internet skills framework

This vital orienting question takes up the challenge of identifying potential associations between the different levels of digital divide and whether this relationship is an instance of compound or sequential digital deprivation. Compound digital exclusion is manifested when a person deficient in a certain digital resource is also deficient in other digital resources of the same type while sequential digital deprivation happens when a person's exclusion of one type causes exclusion of a different type (van Deursen et al., 2017). The lack of internet connection leading to the absence of internet use is an example of compound digital deprivation that operates in the first and second levels while a lack of skills in finding the price online which results in buying marked up products is an example of sequential deprivation in the second and third levels.

Internet skills form a key part of digital inclusion by mediating digital activities and engagements. The relationship of operational (OPNSKL), information-navigation (INFONAV), social (SOCSKL), and creative (CREASKL) skills which is the antecedent to the examination of internet usage for educational purposes (EDUCUSE) and its outcomes for property (PROPOUT), finance (FINOUT), employment (EMPOUT), and education (EDUCOUT) are scrutinized. The following hypotheses are presented and summarized in Figure 2:

H_1: Operational skills directly affects Information-navigation skills
H_2: Operational skills directly affects social skills
H_3: Operational skills directly affects creative skills
H_4: Information-navigation skills directly affects social skills
H_5: Information-navigation skills directly affects creative skills
H_6: Social skills directly affects creative skills
H_7: Creative skills directly affects Use education
H_8: Use education directly affects Outcome property
H_9: Use education directly affects Outcome finance
H_{10}: Use education directly affects Outcome employment
H_{11}: Use education directly affects Outcome education
H_{12}: Creative skills directly affects Use education

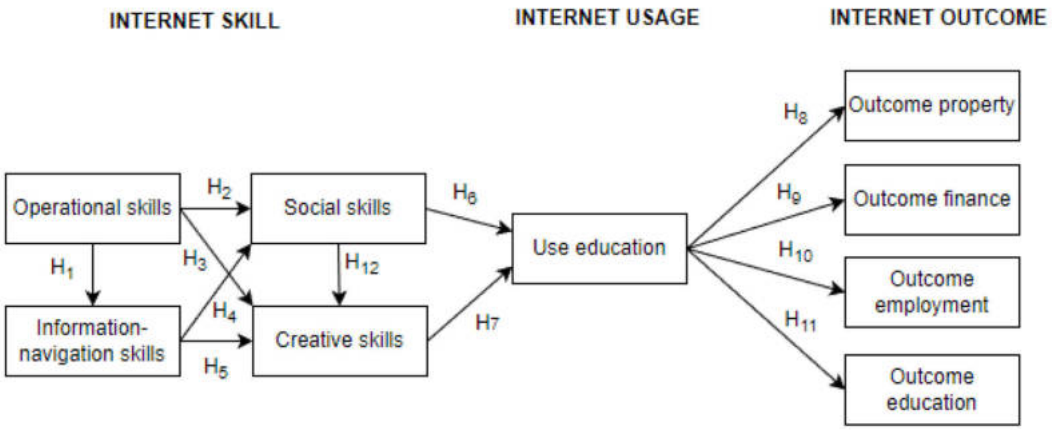

Figure 2: Model for Internet Skills, Internet Use, and Economic Outcome

Research Method

Sample and Measure. An online survey was conducted over a period of 2 months (April and May) in 2022 using Google Forms. The respondents are all educational workers involved in public and private education sectors and recruited using convenience sampling, due to the pandemic.

They were given the link where their skills, use, and the outcome of their online activities are measured using a 20-item Internet skill instrument developed by Van Deursen et al. (2016) using a 5-point agreement scale (1 = strongly disagree, 5 = strongly agree). Its psychometric properties are reliable and valid for operational (α = .84), information-navigation (α = .88), social (α = .87), and creative skill (α = .89) which also exhibits high internal consistency.

The 3-items measure for the Internet Usage by Van Deursen et al. (2017) is mapped for the tangible outcomes and activities for education (α = .93) using a 5-point scale (1 = never, 5 = daily) ordinal-level measure. Outcomes in the four domains are the focus of the Internet outcome scale which is designed as the only direct result of a particular type of online use (e.g., use of Internet for education). While the Use of the Internet clearly always precedes a tangible outcome, the possibility that there are unintended benefits for the use of the Internet for the education domain to other unrelated domain might occur so the crisscrossing lines between Use and Outcomes are examined using a7-items using a 6-point agreement scale (1 = strongly disagree, 5 = strongly agree) as an ordinal-level measure with 0 corresponding to outcome variables which the respondent has never engaged with (Van Deursen et al., 2017). The demographic characteristics of the sample are presented in Table 1 where it can be learned that the majority of the respondents are from privately owned institutions of learning (n=126, 59.4%) and are within the 31-45 years old age range (n=106, 50%). Respondents are mostly female education workers (n=146, 69%) reporting that they spend less than 3 hours/day (n=51, 24%), 4-8 hours/day (n=93, 44%), and more than 8 hours/day (n=68, 32%) online. Academic credentials are heavy with those with master's degree (n=99, 47%) and bachelor's degree (n=97, 46%).

Table 1: Demographic profile of the respondents (n=212)

	Sample		Female		Male	
	n	%	n	%	n	%
# hours online						
<4 hours/day	51	24.1	48	22.6	3	1.4
4-8 hours/day	93	43.9	63	29.7	30	14.2
> 8 hours/day	68	32.1	35	16.5	33	15.6
Age (years)						
20-30 years old	43	20.3	28	13.2	15	7.1
31-45 years old	106	50.0	67	31.6	39	18.4
46-60 years old	60	28.3	49	23.1	11	5.2
60 years old and above	3	1.4	2	0.9	1	0.5
School Type						
Private Owned	126	59.4	74	34.9	52	24.5
Public/Government	86	40.6	72	34.0	14	6.6
Education						
Associate degree	1	0.5	1	0.5	0	0.0
Bachelor's degree	97	45.8	74	34.9	23	10.8
Master's degree	99	46.7	62	29.2	37	17.5
Professional degree	4	1.9	3	1.4	1	0.5
Doctorate degree	11	5.2	6.0	2.8	5.0	2.4

Table 2 summarizes the utilization of the different gadgets with majority of the respondents reporting that they own the smartphone they use to go online (n=201, 95%), tablet (n=94, 44%), laptop (n=170, 80%), personal computers (n=77, 36%), and smart TV (n=103, 49%). Majority of the respondents reported that they do not utilize gaming consoles for Internet connection (n=130, 61%). As reported by the respondents, institutions that provide gadgets to the educational workers are very minimal: smartphone (n=2, 1%), tablet (n=11, 5%), laptop (n=24, 11%), personal computers (n=49, 23%), smart TV (n=9, 4%), and gaming console (n=3, 1%).

Table 2: Gadgets utilization profile

	Smartphone				Tablet				Laptop				PC				Smart TV				Game Console			
	O	B	P	N	O	B	P	N	O	B	P	N	O	B	P	N	O	B	P	N	O	B	P	N
Gender																								
Female	140	1	1	4	66	15	9	56	116	6	20	4	58	18	28	42	71	11	8	56	36	23	3	84
Male	61	0	1	4	28	2	2	34	54	3	4	5	19	3	21	23	32	1	1	32	14	6	0	46
School Type																								
Private Owned	116	0	2	8	53	2	6	65	103	5	9	9	40	3	40	43	50	0	5	71	23	4	1	98
Public/Government	85	1	0	0	41	15	5	25	67	4	15	0	37	18	9	22	53	12	4	17	27	25	2	32
Age (years)																								
20-30 years old	42	0	0	1	16	4	4	19	33	0	7	3	12	5	11	15	19	4	5	15	12	8	2	21
31-45 years old	102	0	1	3	47	5	6	48	86	7	12	1	42	8	19	37	53	3	2	48	26	10	1	69
46-60 years old	56	0	1	3	29	8	1	22	48	2	5	5	21	8	19	12	30	5	2	23	11	11	0	38
60 years old and above	1	1	0	1	2	0	0	1	3	0	0	0	2	0	0	1	1	0	0	2	1	0	0	2
Education																								
Associate degree	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	1
Bachelor's degree	94	0	0	3	43	6	5	43	72	3	16	6	35	12	19	31	54	5	4	34	29	12	3	53
Master's degree	93	0	2	4	40	11	6	42	85	4	7	3	33	9	29	28	42	7	5	45	16	17	0	66
Professional degree	4	0	0	0	3	0	0	1	4	0	0	0	3	0	0	1	2	0	0	2	2	0	0	2
Doctorate degree	9	1	0	1	7	0	0	4	9	1	1	0	6	0	1	4	5	0	0	6	3	0	0	8

Legends: **O** - Owned **B**- Borrowed **P** - Provided by the school/institution **N** - N/A

Statistical Analysis. SEM-PLS was used to determine the association between the Internet skills, uses, and outcome variables for the hypothesized relationships. SMART PLS 3.3.7 (Ringle, Wende, & Becker, 2015) is used to test the model for t-tests, correlation, path analysis, and to evaluate the equation model.

Results

Reliability and Validity Analysis. Table 3 shows that the constructs exhibit internal consistency and reliability because the values are all higher than the set target of > 0.70 (Hair et al., 2021, Ketchen, 2013). The relationship between the item and the construct should be equal to or greater than 0.50 (Kock, 2015) emphasizing that the parameters for confirmatory factor analysis have been validated for this study.

Table 3: Construct Reliability, Validity, and Loadings

	CREASKL	EDUCOUT	EDUCUSE	EMPOUT	FINOUT	INFONAV	OPNSKL	PROPOUT	SOCSKL	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
CreaSkl1	0.907									0.854	0.889	0.9	0.693
CreaSkl2	0.853												
CreaSkl4	0.745												
CreaSkl5	0.817												
EcoOutEduc1		1.000								1.000	1.000	1.000	1.000
EconUseEduc1			0.927							0.892	0.892	0.933	0.822
EconUseEduc2			0.911										
EconUseEduc3			0.882										
EcoOutEmp2				1.000						1.000	1.000	1.000	1.000
EcoOutFin1					1.000					1.000	1.000	1.000	1.000
InfNavSkl1						0.884				0.899	0.911	0.93	0.768
InfNavSkl2						0.908							
InfNavSkl3						0.848							
InfNavSkl4						0.863							
OpSkill4							0.966			0.935	0.94	0.968	0.939
OpSkill5							0.972						
EcoOutProp2								1.000		1.000	1.000	1.000	1.000
SocSkl3									0.946	0.887	0.888	0.947	0.899
SocSkl5									0.950				

In Table 4, heterotrait-monotrait ratio of correlations (HTMT) is used to test for discriminant validity between two reflective constructs. According to Henseler, Ringle, & Sarstedt (2015), a value below 0.90 implies that the measure's discriminant validity has been established.

Table 4: Discriminant Validity Using Heterotrait-Monotrait Ratio of Correlations (HTMT)

	CREASKL	EDUCOUT	EDUCUSE	EMPOUT	FINOUT	INFONAV	OPNSKL	PROPOUT
EDUCOUT	0.18							
EDUCUSE	0.25	0.28						
EMPOUT	0.14	0.26	0.35					
FINOUT	0.33	0.21	0.38	0.33				
INFONAV	-0.26	-0.09	-0.05	-0.03	-0.16			
OPNSKL	0.32	-0.05	0.16	0.01	0.19	0.03		
PROPOUT	0.04	0.24	0.21	0.38	0.28	0.05	0.01	
SOCSKL	0.54	0.04	0.14	-0.09	0.24	-0.16	0.45	-0.10

Structural Model and Hypothesis Result. A subsample of 5000 is set in the bootstrapping process to validate the inner model in testing the hypotheses (Hair et al., 2011). The significance of each path coefficient is accepted if the t-value is greater than 1.95.

Before testing the structural model, fit adjustment with standardized root mean square residual (SRMR) value was evaluated. The result (SRMR=0.053, Chi-Square = 522.223) indicates a good fit adjustment since a value less than 0.10 or of 0.08 for SRMR are considered a good fit (Hu and Bentler, 1999, Henseler et al., 2014). Table 5 shows the path coefficients and the t-value for each path in accordance with the hypothesized relation.

Table 5: Path Coefficients and Hypotheses results

Hypothesis	Path	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Result
H1	OPNSKL→INFONAV	0.029	0.025	0.067	0.436	0.66	Not Supported
H2	OPNSKL→SOCSKL	0.452	0.447	0.079	5.696	0.00	Supported
H3	OPNSKL→CREASKL	0.115	0.116	0.056	2.065	0.04	Supported
H4	INFONAV→SOCSKL	-0.177	-0.180	0.072	2.447	0.01	Supported
H5	INFONAV→CREASKL	-0.189	-0.194	0.065	2.879	0.00	Supported
H6	SOCSKL→EDUCUSE	-0.003	0.000	0.071	0.042	0.97	Not Supported
H7	CREASKL→EDUCUSE	0.255	0.257	0.085	2.992	0.00	Supported
H8	EDUCUSE→PROPOUT	0.210	0.210	0.069	3.070	0.00	Supported
H9	EDUCUSE→FINOUT	0.384	0.385	0.063	6.135	0.00	Supported
H10	EDUCUSE→EMPOUT	0.349	0.350	0.065	5.393	0.00	Supported
H11	EDUCUSE→EDUCOUT	0.282	0.281	0.070	4.032	0.00	Supported
H12	SOCSKL→CREASKL	0.461	0.455	0.068	6.823	0.00	Supported

Discussion. In the examination of the associations within the different Internet skills. The result summarized in Figure 3 shows that Operational skills' positive direct effect on Social skill is significant at (OPNSKL→SOCSKL=0.452, t-value = 5.696). The Operational skills' positive direct effect on Creative skill is significant at (OPNSKL→CREASKL=0.115, t-value = 2.065). Information-Navigation skills' negative direct effect on Social skill is significant at (OPNSKL→SOCSKL=-0.177, t-value = 2.447). Information-Navigation skills' negative direct effect on Creative skill is significant at

(OPNSKL→CREASKL=-0.189, t-value = 2.879). Social skills' positive direct effect on Creative skill is significant at (SOCSKL→CREASKL=0.461, t-value = 6.823).

In the second-level examination of the effect of Internet skill to Internet Usage for Education, only the Creative skills' positive direct effect on Educational use is significant at (SOCSKL→EDUCUSE=0.255, t-value = 2.992), social skill has no significant effect.

In the third-level examination of the effect of Internet Usage for Education on the Outcome received from the Internet, educational usage's positive direct effect on Property outcome is significant at (EDUCUSE → PROPOUT=0.21, t-value = 3.07). Educational usage's positive direct effect on Financial outcome is significant at (EDUCUSE → FINOUT=0.384, t-value = 6.135). Educational usage's positive direct effect on Employment outcome is significant at (EDUCUSE → EMPOUT=0.349, t-value = 5.393). Educational usage's positive direct effect on Educational outcome is significant at (EDUCUSE → EDUCOUT=0.282, t-value = 4.032).

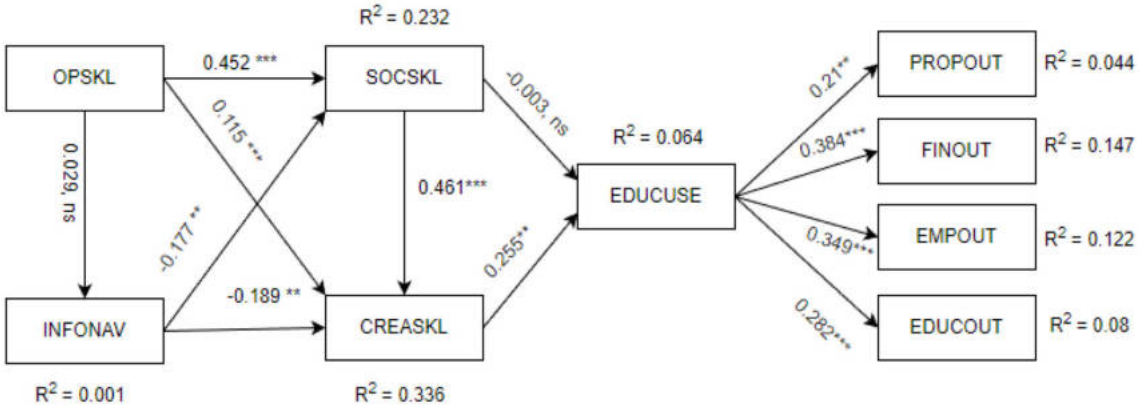

Figure 3: Result of a structural model

To answer the question of how the different Internet skill affects the use and creation of educational content and its resulting online or real-life outcomes, the result summarized in Table 6 shows the significant interaction between these variables. For the first and second-level examinations, the Operational skill has a positive indirect effect on Creative Skill via Social Skill (OPNSKL→SOCSKL→CREASKL=0.208, t-value=3.981). Information-navigation skill has a negative indirect effect on Creative skill via Social skill (INFONAV→SOCSKL→CREASKL=-0.082, t-value=2.339). Information-navigation skill has a negative indirect effect on Internet use for Education via Creative skill (INFONAV→CREASKL→EDUCUSE=-0.048, t-value=1.972). Operational skill has a positive indirect effect on Internet use for Education via Social skill and Creative skill (OPNSKL→SOCSKL→CREASKL→EDUCUSE=0.053, t-value=2.284). Social skill has a positive indirect effect on Internet use for Education via Creative skill (SOCSKL→CREASKL→EDUCUSE=0.118, t-value=2.688).

The complete examination of the three levels shows that the Creative skills have a positive indirect effect on Employment outcome via Internet use for Education (CREASKL→EDUCUSE→EMPOUT= 0.089, t-value= 2.424). Social skills have a positive indirect effect on Educational outcome via Creative skill and Internet use for Education (SOCSKL→CREASKL→EDUCUSE→EDUCOUT=0.033, t-value= 2.019). Creative skills have a positive indirect effect on Financial outcome via Internet use for Education (CREASKL→EDUCUSE→FINOUT=0.098, t-value=2.387). Information-navigation skill has a negative indirect effect on Property outcome via Social skill, Creative skill, and Internet use for Education

(INFONAV→SOCSKL→CREASKL→EDUCUSE→PROPOUT=-0.004, t-value= 1.441). Creative skills have a positive indirect effect on Educational outcome via Internet use for Education (CREASKL→EDUCUSE→EDUCOUT= 0.072, t-value= 2.141). Social skill's positive indirect effect on Employment outcome via Internet use for Education (SOCSKL→CREASKL→EDUCUSE→EMPOUT= 0.041, t-value= 2.264).

Table 6: Specific Indirect Effects

Indirect Effects	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
OPNSKL→ SOCSKL→CREASKL	0.208	0.205	0.052	3.981	0.000
INFONAV→SOCSKL→CREASKL	-0.082	-0.082	0.035	2.339	0.019
INFONAV→CREASKL→EDUCUSE	-0.048	-0.05	0.024	1.972	0.049
OPNSKL→SOCSKL→CREASKL→EDUCUSE	0.053	0.053	0.023	2.284	0.022
SOCSKL→CREASKL→EDUCUSE	0.118	0.117	0.044	2.688	0.007
CREASKL→EDUCUSE→EMPOUT	0.089	0.091	0.037	2.424	0.015
SOCSKL→CREASKL→EDUCUSE→EDUCOUT	0.033	0.034	0.016	2.019	0.044
CREASKL→EDUCUSE→FINOUT	0.098	0.101	0.041	2.387	0.017
INFONAV→SOCSKL→CREASKL→EDUCUSE→PROPOUT	-0.004	-0.004	0.003	1.441	0.150
CREASKL→EDUCUSE→EDUCOUT	0.072	0.074	0.034	2.141	0.032
SOCSKL→CREASKL→EDUCUSE→EMPOUT	0.041	0.041	0.018	2.264	0.024

Path analysis revealed that Information-navigation skills have negative direct and indirect effects on the relationships between Internet skills, use, and intended outcomes. Congruent to the result of Helsper et al. (2015)'s study on the tangible outcomes of the Internet use where it was mentioned that information navigation is related to lower achievement levels in cultural, social, and personal outcomes. Moreover, the study of Khan et al. (2022) where they found that Information-navigation skill was not significantly related to digital literacy, academic achievement and employment among young professionals somewhat strengthens this claim.

Creative skill provides the highest load to Financial outcome followed by Creative skill provides the highest load to Employment outcome. These findings are consistent with the data of Helper et al. (2015) supporting creative skills as an important factor to achieve outcomes from engagement with online activities. Participants with higher education were more satisfied with economic and personal outcomes than those with lower counterparts, but this could be explained through their differences in creative and social skill levels. The achievement of outcomes was mostly explained by creative and information navigation skills.

Conclusion

Internet skills form a key part of digital inclusion and in this study, creative and information navigation skills are found to have the biggest direct and indirect impact on the financial and employment outcome among educators. It is therefore clear that creative and information navigation skills are important in achieving outcomes from engagement with online activities specially during and post pandemic where online transactions became the norm.

As the present study only examined Educational use as the mediator between Internet skills and Economic outcome, other researchers may test the other economic model (employment, finance, and property) as mediators to not only Economic outcome but the other offline outcomes as well (identity, belonging, formal and informal networks, political network, health, self-actualization, and leisure).

The generalizability of this paper is limited to the Metro Manila educators during the pandemic. While this could be a limitation to the paper, others may also consider testing these models using multigroup analysis to test the structural models by age, gender, and educational attainment groups as this research did not consider the required observations for such analysis. Other scholars may also find interest in examining the same model in another locale, those with limited Internet access or target the student as this may yield interesting results.

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A Scientometric Analysis on Chinese Higher Education Informatics

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ABSTRACT

A scientometric and visualization analysis was used in this study to explore the research trend of the Chinese higher education informatics. A total of 524 samples of documents published from Jan 2011 to Dec 2021 on the Chinese higher education informatics were analyzed. The research literature was retrieved from the Chinese Social Science Citation Index (CSSCI). By analyzing the publication trends of the documents, this study identified the development publication topical trends of Chinese higher education informatics. The findings showed that the research of Chinese higher education informatics maintaining a fluctuating steady rise trend from 2011 to 2019. After COVID-19, the research increased significantly with the year 2020 peaking at 85 articles. University/college with the application of MOOC, digital campus, and AI, has experienced the latest research trends. In this study, we also highlighted influential authors, institutions, and journals that contributed significantly to research on higher education informatics in China, which may help to understand the overall development of Chinese higher education informatics and future research directions.

Keywords: Higher education informatics, Scientometric analysis, China, CSSCI

Introduction

In the 1990s, with the introduction of the information superhighway plan, the concept of higher education informatics was also formally put forward (Alberico, 1990). Information technology is now widely used in the field of higher education, providing important information resources for teaching, learning, and scientific research. Information construction has become the development trend of today's education. In order to adapt to the development and changes of the new information era, worldwide HEIs made every effort to put forward the process of educational modernization and the development of education informatics. Developed countries, take the United States and the United Kingdom as examples, the United Sates started the large-scale research on the "informatics Campus Project" early in 1990 (Green, 1991), and the United Kingdom begun education informatics research from multiple fields and perspectives, and has established a foundation for the academic research on informatics (JIRC & EDUCAUSE, 2015). Furthermore, the informatics construction of Korean higher education, such as Brain Korea 21 plus (BK 21+) project, also played an important role in promoting university academic research and scientific practice innovation (Liu & Ko, 2020; Wei & Ko, 2020). Higher Education informatics can not only cultivate innovative talents but also diversify educational teaching and learning models and promote the development of higher educational theories (Zhao, Llorente, & Gómez, 2021).

In the certain context of China, Chinese Ministry of Education [MOE] (1998) first issued the "Educational Promotion Action Plan for the 21st Century", which proposed to vigorously improve the modernization level of educational technology and the level of education informatics. Subsequently, the "Internet + Education" (MOE, 2012), "Thirteenth Five-Year Plan for Education Informatics" (MOE, 2016) and "Education Informatics 2.0 Action Plan" (MOE, 2018) proposed by the state also reflect that higher education informatics is still the focus of the education field. Recently, on March and May 2021, due to the huge demand on digital learning contents and e-learning systems, Chinese government published the newest digital university construction strategy for better support the higher education informatics (MOE, 2021a, 2021b). By obtaining outstanding achievements within 10 years, we considered the Chinese situation in higher education informatics may set an example for other countries.

In the past 10 years, scholars in China have carried out continuous and diverse research on higher education informatics, but there are still few trends in summarizing and specific analysis of these research results. Studies related to elementary and secondary education informatics (Zhang, Wu, Bai, Ji, & Li, 2018) have been steadily conducted in China, but it is difficult to find studies that analyzed the trends of studies conducted on higher education so far (Liu & Ko, 2021). Therefore, a scientometric analysis of last 10 years of article research would help to understand the publication trends, influential scholars, institutions, and journals of the research during this period, and the research results can also be used as basic analysis data for future related research. Thus, research questions were as following:

(1) What are the publication and development trends of higher education informatics in China from 2011 to 2021?
(2) What are the influential scholars, institutions, and journals related to the research of higher education informatics in China from 2011 to 2021?

Literature Review

The construction and research of higher education informatics started early and developed rapidly around the world. Nowadays, research organizations and top academic journals with mature internal structure and extensive international influence have been formed. For example, EDUCAUSE is committed to promoting effective cooperation between IT organizations of various universities, providing important guidance for the formulation of higher education informatics strategies of the country and universities, and building a shared higher education informatics high-tech by academic research alliances (JIRC & EDUCAUSE, 2015). However, there were also some problems in the informatics construction of higher education in major developed countries. Study has found that, taking

the United States and Japan as examples, universities in the two countries have the problem of reducing informatics construction funding and rising informatics construction costs (Daniel, 2015).

In the certain context of China, scholars and HEIs has conducted large amount of research on higher education informatics focusing on various topics, using various research methods and theories for last two decades. For example, regarding the impact on teaching, some scholars mentioned that information technology provides convenient tools for teacher-student exchanges and cooperation, and at the same time provides more diversified learning resources for the teaching process and promotes the formation of students' autonomous and self-adaptive learning (Wu, Xie, Dai, & Li, 2016). However, scholars also emphasized that the wide application of informatics in education will increase the function and role of teachers' teaching work. No matter what kind of information teaching method is, teachers need to combine teaching content, traditional teaching methods and modern information education methods to explore new education courses and methods and processes (Peng, Li, Wang, & Du, 2021).

Furthermore, as we can see from the previous studies, the research objects and documents data were almost collected from the English-based academic index (such as the Web of Science, Scopus, and Google Scholar) (Jing, Ghosh, Sun, & Liu, 2020), while lack sufficient research on local Chinese significant academic literature (such as Chinese Social Science Citation Index). Among these studies on Chinese education informatics, most of which were mainly focused on the basic education informatics (Zhang, Wu, Bai, Ji, & Li, 2018), or the policies and national strategies (Han & Li, 2019; Hu, 2021; Liu & Chen, 2021). Therefore, we hope to give an overall view of the publication trends, influential scholars, institutions, and journals of the Chinese higher education informatics.

Research Method

Research method and tool

This paper employed a scientometric analysis method. Scientometrics was primarily employed to analyze research literature based on the attributes in the research itself, such as the number of publications, authors, or other dynamic indicators such journals information (Sengupta, 1992). The network analysis in scientific literature can be used to explore the correlations between different research studies to reveal the potential research issues and the intellectual structure in a certain research field (Chen et al., 2019). This method has been widely used in systematic literature review studies (Wu et al., 2016) and has proven effective (Chen, 2017; Chen & Wu, 2017; Khassch et al., 2017). In this study, publication trends, contributions of the scholars, institutions, and core journals were analyzed for better understanding Chinese higher education informatics.

Data collection and processing procedure

The data used in this study come from the CSSCI database created by Nanjing University. The CSSCI database is updated each year, so the date range for the literature was set to be Jan 2011 to Dec 2021. This study used academic research papers in the field of higher education informatics in the CSSCI database as the research sample. "higher education informatics", "university/college informatics" were used as the keywords. The exact match search method was conducted. As a result, a total of 596 documents were retrieved, and 72 nonacademic literatures such as reports, meeting records, and repeated literature was manually removed, resulting in 524 literature records, including information on the literature such as the author(s), institution(s), publication date, and related journals. And export the relevant 524 data set for the final analysis. After collecting all the data, the 524 data retrieved from CSSCI were exported according to publication quantity, authors, institutions, and journals were analyzed in detail. The process to identify the samples with inclusion and exclusion criteria is shown in Figure 1.

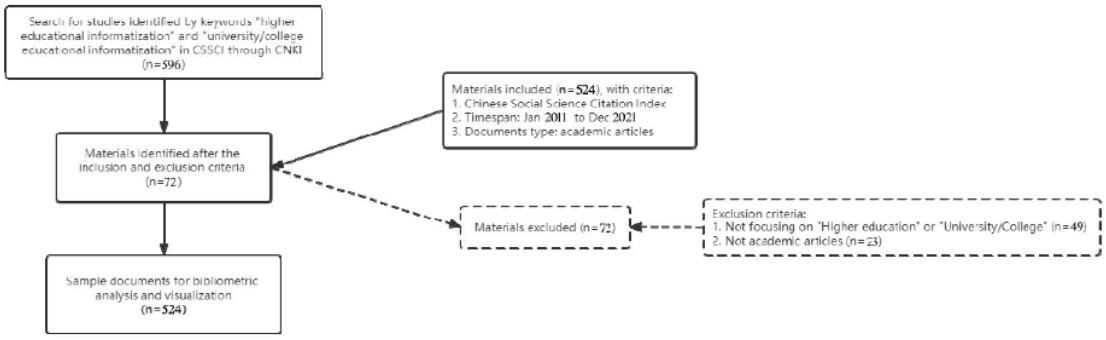

Figure 1: Data collection process with inclusion and exclusion criteria.

Results

Publication trends

To understand the annual research status in the field of higher education informatics, a statistical analysis of the number of articles issued per year is shown in Figure 2. From Figure 2, it can be seen that from 2011 to 2021, the number of articles issued is related to higher education information. There are total of 596 documents related to higher education. In the past ten years, the publication changes in Chinese education informatics research literature has shown a fluctuating and steady increase trend. Since 2011, the number of articles published gradually increased every year, reaching the first peak in 2016, with 61 articles. From 2011 to 2016, the cumulative number of articles published was 308, accounting for 51.7% of the total literature. A large number of research results appeared in this stage. This is because, in 2012 and 2016, the state issued the outline of the education reform and development plan. On the other hand, various national departments are paying more and more attention to informatics construction and promoting the development of education. From 2017 to 2019, it showed a slight downward trend until the number of articles issued in 2019 to the bottom 43, which reflects the gradual fading of the quantitative increase in pursuit of qualitative increase on the research topic of higher education informatics, thus residing in a smoothly sustained in-depth study. Furthermore, after the outbreak of the covid-19 in 2020, Due to the comprehensive promotion of online learning and digital campuses, research results in 2020 have seen a dramatic increase as 85 papers. After the research boom dissipates, the number of publications in 2021 stabilized at 51. During the 10 years, the research content of higher education informatics has been further refined and expanded, and the practical and theoretical research has become more in-depth. New keywords, mainly include smart education, information-based teaching, MOOC, big data, digital campus, information leadership, flipped classroom, cloud computing, education informatics 2.0, appeared and even dominated the topic of the research in this domain.

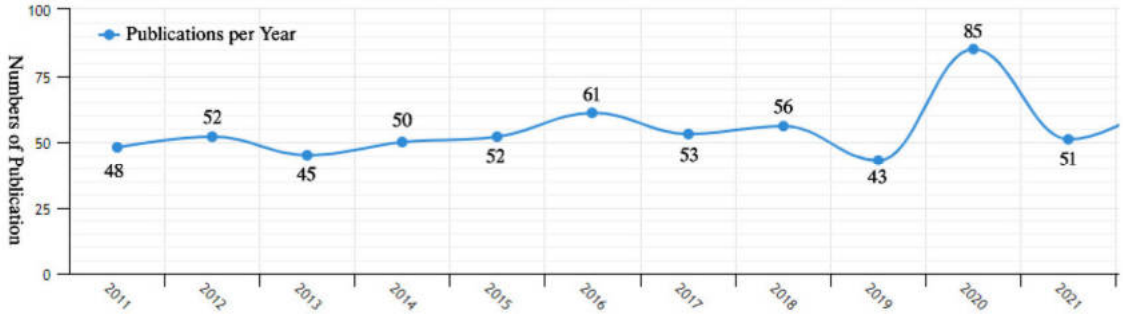

Figure 2: Publication Trends of Chinese Higher Education Informatics.

Influential scholars

To get the most influential scholars, we conducted an analysis on the authors of all 524 documents. Top 9 of the most contributing and influential scholars were listed in Table 1. Findings showed there were 9 scholars whose number of articles published equal to or more than 5. Most of the other authors only have 4 articles or even less, which showed that in the field of Chinese higher education informatics research, there are not many personal research results. According to Table 1, Chen Lin (from Jiangsu Normal University) and Huang Ronghuai (from Beijing Normal University) with the publication of 10 and 8 articles, ranking the top two influential scholars. Followed by Wu Zhi (from Huazhong Normal University) and Liu Yonggui (from Nanjing University of Posts and Telecommunications) both with the publication of 7 articles. Then Ren Youqun (from Huadong Normal University) with the publication of 6 articles. At last were Liang Linmei (from Henan University), Li Fengqing (from Shandong Normal University), Jin Hui (from Shanghai International Studies University), and Wei Xiaorong (from Huazhong Normal University) with all the same 5 articles. Furthermore, scholar Chen Lin mainly studies the development trend and challenges of higher education informatics. Scholar Huangronghuai majors in the definition and research status of higher education from the perspective of informatics. Scholar Wu Zhi pays more attention on the practical application of information technology integrating in higher education field.

Table 1: Summary of Top 9 Influential Scholars

No.	Scholar	Number of Articles	Affiliation
1	Chen Lin	10	Jiangsu Normal University
2	Huang Ronghuai	8	Beijing Normal University
3	Wu Zhi	7	Huazhong Normal University
4	Liu Yonggui	7	Nanjing University of Posts and Telecommunications
5	Ren Youqun	6	Huadong Normal University
6	Liang Linmei	5	Henan University
7	Li Fengqing	5	Shandong Normal University
8	Jin Hui	5	Shanghai International Studies University
9	Wei Xiaorong	5	Huazhong Normal University

For the collaboration among scholars, as showed in Figure 3, each circle represents an author, the size of the circle represents the volume of each author's publications, the larger the node, the more the author's publications, the connection between authors means that there is a cooperative relationship between authors, and the thicker the connection between authors, It shows that the cooperation relationship is closer. It can be seen from Figure 3 that there are few connections between authors, indicating that there is little communication between authors on literature cooperation, so the number of papers published in collaborative research between authors is very small. The representative group is a group represented by scholars Chen Lin, Liu Yonggui, and Jin Hui, who cooperate with Youqun, Liang Linmei and Li Fengqing. Meanwhile, there is also cooperation between Wu Zhi, Wei Xiaorong and Huang Ronghuai.

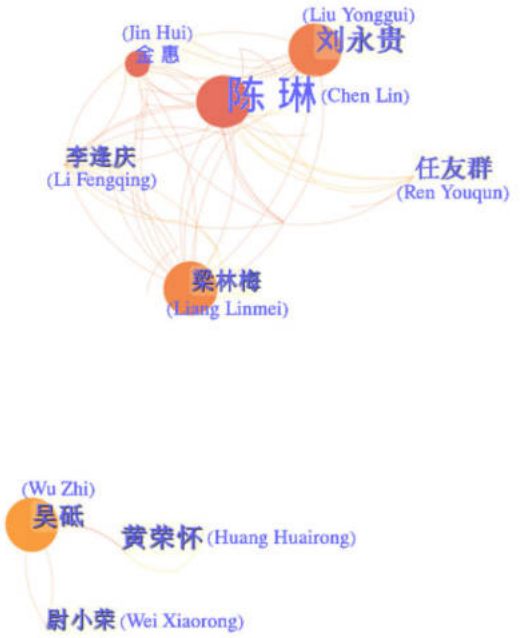

Figure 3: Scholars Collaboration Networks.

Influential institutions

For the most influential institutions, we conducted an analysis on the institutions of all 524 documents. Top 10 of the most contributing and influential institutions were listed in Table 2. Findings showed there were 10 institutions that published equal to or more than 10 articles. Most of the other institutions only have 10 articles or even less, which showed that in the field of Chinese higher education informatics research, there are not many personal research results. The total publications of the 10 influential institutions are 179, among which, Department of Educational Information Technology (from Huadong Normal University) and Department of Education (from Beijing Normal University) both took the lead of 32 articles. Next influential institution that published 20 articles is the Education Research Institute (from Jiangsu Normal University). Then the Modern Education Technology Center (from Nanjing University) as well as the Department of Education (from Nanjing University) with the publication of both 18 articles. The following are the Department of Educational Information Technology (from Huanan Normal University) with 16 articles, the Department of Information Management (from Shanghai International Studies University) with 12 articles, and the College of Education Science (from Peking University) with 11 articles. At last are the National Department of Digital Education (from Nantong University), and the Department of Education (from Henan University) with both 10 articles. Furthermore, the top two influential institutions with more than 30 articles, accounting for nearly half of the total publications, and most of them were published in core journals. The research results in the field are also relatively rich and the content is relatively representative, which has a very important impact on the development of higher education informatics, and has great reference and reference significance for future research in the field of higher education informatics.

Table 2: Summary of Top 10 Influential Institutions

No.	Institutions	Number of Articles
1	Department of Educational Information Technology, Huadong Normal University	32
2	Department of Education, Beijing Normal University	32
3	Education Research Institute, Jiangsu Normal University	20
4	Modern Education Technology Center, Huadong Normal University	18
5	Department of Education, Nanjing University	18
6	Department of Educational Information Technology, Huanan Normal University	16
7	Department of Information Management, Shanghai International Studies University	12
8	College of Education Science, Peking University	11
9	National Department of Digital Education, Nantong University	10
10	Department of Education, Henan University	10

For the collaboration among influential institutions, showed in Figure 4, there is barely cooperation between institutions. It shows that most of the cooperation is limited within one institution or university, and there is very little cooperation between different HEIs. The lack of communication and cooperation among institutions, colleges and universities is not conducive to academic development, and will form information barriers and reduce work efficiency. Therefore, communication and cooperation between different HEIs should be strengthened to promote the rapid development of education informatics research.

Figure 4: Institutions Collaboration Networks.

Influential journals

The choice of the correct journal affects the reach and impact of scientific writing. Henceforth, it is essential to assess journal influence in the research domain. Based on a statistical analysis of the sources of literary journals, 524 data documents are all from 111 CSSCI journals, and the number of publications in different types of journals is also different, but it can still be found that the distribution of documents is relatively concentrated to a certain extent. This paper screens the journals with 15 or more articles and obtains Table 3. From Table 3, we can see that there are a total of 10 types of journals

with 15 or more articles, and the number of documents is 305, and the cumulative proportion of the total number of documents is 58.2%. The most influential journal is 'China Educational Technology', which has 59 articles, accounting for 19.3% of the 10 journals; followed by 'e-Education Research', which has 51 articles, accounting for 16.7% of the 10 journals; the rest are 'Journal of Distance Education' (33, 10.8%), 'Modern Distance Education Research' (33, 10.8%), 'Open Education Research' (30, 9.5%), 'Information Science' (24, 7.9%), 'China Higher Education Research' (24, 7.9%), 'Educational Research' (18, 5.9%), 'Educational Research' (18, 5.9%), and 'Research in Educational Development' (15, 4.9%). The number of core journals is relatively considerable, which to a certain extent reflects that the scholars have conducted in-depth research on higher education informatics. They pay attention to the quantity as well as the quality of the documents.

Table 3: Summary of Top 10 Influential Journals

No.	Journal	Frequency	Percent (%)
1	China Educational Technology	59	19.3
2	e-Education Research	51	16.7
3	Journal of Distance Education	33	10.8
4	Modern Distance Education Research	33	10.8
5	Open Education Research	30	9.8
6	Information Science	24	7.9
7	China Higher Education Research	24	7.9
8	Educational Research	18	5.9
9	Journal of Higher Education	18	5.9
10	Research in Educational Development	15	4.9

Conclusions and limitations

This study conducted a scientometric analysis for the research in the Chinese higher education informatics. This study aimed to address various scientometric features such as publication trends, influential scholars, institutions, and journals analysis. The literature related to higher education informatics was retrieved from CSSCI from January 2011 to December 2021. The growth of publications related to higher education informatics has a fluctuating steady rise from 2011 to 2019, especially after covid-19 pandemic where universities and colleges faced with the turning point from traditional face-to-face class into the fully online learning which emphasize the importance of informatics construction and integration in HEIs. Meanwhile, the most influential scholars are Chen Lin, Huang Huairong, and Wu Zhi. The most influential institutions are the Department of Educational Information Technology (from Huadong Normal University) and Department of Education (from Beijing Normal University). Furthermore, the 'China Educational Technology' and 'e-Education Research' are the most influential journals in this field with high publication and citation.

Through the analysis of the specific content of 524 papers, we found that, though higher education informatics research in China achieved huge improvement both in quantity and quality, there still remain a few issues to be concerned. First is that although the number of policy studies is generally significant, however, most of them were mainly conducted at the macro level, focusing on the overall combing and summary of relevant policy programs. Thus, there lack sufficient research on the interpretation and analysis of specific policy content (Hu, 2021; Liu & Zhou, 2021). Second, regarding the design and development of higher education informatics, the main research theme is the influence and changes of traditional education under the informatics environment. In the integration of education informatics and specific course teaching, the combination of information technology and English class is the main cases of this topic research have obvious deficiencies in the research of other subjects (Gao,

Fang, & Fan, 2015; Zhang & Wang, 2013). Furthermore, in the context of the research related to the information management and operation of higher education, the research is more concentrated in the application of information technology and new media (Guo & Yang, 2019; Wu, Xie, Dai, & Li, 2016).

At last, the importance of this article is to identify the publication trends, influential scholars, institutions, and journals of the higher education informatics in China through scientometric analysis. We also discussed the limitations of the researches based on the findings. This paper may be helpful to researchers and academicians in the field of higher education informatics for future research. Also, there may be some possible limitations in this article. The article used CSSCI as a core database. Therefore, the views represented by the results are limited and the results may be vary with different classification criteria so that the use of methods and the interpretation of results are subjective. Besides, this article mainly focused on the discussion of information technologies, but it still needs to explore higher education informatics from other perspectives. In the future, we hope to conduct more in-depth discussions on informatics and higher education topics from a future perspective, especially after the covid-19 pandemic.

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Ambidextrous Chair: Design Solution for Both Right and Left Handed Persons

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ABSTRACT

School chairs are essential pieces of classroom furniture in academic institutions. An assigned armchair may affect the student's ability to focus, comprehend and interact with the teacher and their peers. This developmental study, therefore, designed, fabricated, and evaluated an ambidextrous chair for both right and left-handers. This study also consisted of designing, developing, and evaluating instructional products that meet internal consistency and effectiveness criteria, such as the product development process analyzed, describing, and evaluating the final product. This study was conducted at Iloilo Science and Technology University, La Paz, Iloilo City, during the school year 2019-2020. The laboratory testing was done at Wooden Living, PHC Block 24 Lot 10, Mandurriao, 5000 Iloilo City. It was observed by the Technical Evaluation team of thirty-five (35) selected students, instructors/professors, and experts in furniture design. The working drawings used AutoCAD application in 2Dimensional (2D). Experts recommended the revision upon observation during the Technical Evaluation. Results showed the Mies Van de Rohe-inspired cantilevered chair made of bent plywood seat and back, comprising a horizontal metal pipe tablet arm support attached under the seat and pivoted and placed in right-hand or left–hand configurations following ergonomics, anthropometry, and universal design. In the context of acceptability of the ambidextrous or neutral chair as to its durability, usability, and stability, it was rated "very high" in all dimensions. Classroom ergonomics like the chairs must meet the standards of education.

Keywords: ambidextrous chair, right and left handed, Mies Van de Rohe

Introduction

Side-biased arm school desks represent an obstacle to learning from pre-school through university (Holder, 2003). A right-biased arm desk does not offer left-handed students the same arm support that right-handed students enjoy. Depending upon the width of the half desk and the way the student holds the pencil, left-handers are susceptible to back, neck, and shoulder pain. A left-hander who writes with an inverted or "hooked" (bent wrist) style at a narrow desk must twist around in a contorted, awkward, and uncomfortable posture. When left-handers are not provided with the right chair, many of these students have to twist their bodies around, facing to the right, to write on a right-biased desk; students may be unfairly accused of cheating.

In the Philippines, the Philippine Handedness Research and Training Institute (PHRTI), in coordination with the Department of Science and Technology (DOST), advanced scientific understanding and knowledge of handedness (left-handed and right-handed) to at least address the social and educational discrimination of left-handers nationwide through research, information, education, and advocacy. During the plenary session on Monday, December 10, 2018, the House of Representatives, in a unanimous vote, passed the third and final reading of the bill mandating educational institutions to provide the appropriate armchairs for left-handed students. Concerning this, 207 lawmakers voted in favor of House Bill No. 8654, or the "Mandatory Provision of Left-Handed Armchairs in Educational Institutions Act." This mandate means that it shall be obligatory for all educational institutions, both public and private, to provide armchairs in the classroom for left-handed students to at least 10 percent of the student population. Philippine President Rodrigo Duterte therefore signed a law that requires schools to provide neutral desks to address the needs of left-handed students in the Republic Act No. 11394 or the Mandatory Provision of Neutral Desks in Educational Institutions Act.

Objectives of the Study

The main objective of this study was to design, fabricate, and evaluate *an Ambidextrous Chair*, a neutral chair for both right and left-handers. Specifically, this study aimed to:

1. design an ambidextrous neutral chair in terms of the principles of anthropometry, ergonomics, and universal design;
2. evaluate the level of acceptability of the ambidextrous chair in terms of usability, durability, and stability; and
3. determine the efficiency of the ambidextrous chair.

Theoretical Framework

This study was anchored on the principle; *Form follows Function.* This is a design credo coined by Louis Sullivan (Wu, 2018). This statement has become a staple principle within design since the rise of modernism. In interior design, the result of a designed space should revolve around its Function. All spaces have presumed functions, but the actual Function of a space is defined by the habits and lifestyle of the users. And that is why interior design should be centered on people. This project also involves ergonomics, anthropometry, and universal design. These were integrated with the design of the neutral chair. Louis Sullivan, a famous architect from America, expressed the Form Follows Function theory in the early 20th century. The words *Form Follows Function* was introduced in 1896 from one of his articles, *The Tall Building Artistically Considered.* In this work, he emphasized that the shape of a building or an object must be adapted to its function or use (Koeper, 2021). Although, as time goes on, the *Form Follows Function* theory is not only for architecture but can also be applied to product design. This principle is why this theory was significant in this study.

Conceptual Framework

This study provides a design of the neutral chair for both right and left-handed students. Also, the study evaluates the level of acceptability of the design in terms of usability, durability, and stability of the neutral chair for both right and left-handers. The neutral chair also integrates ergonomics, anthropometry, and universal design. Figure 1 reflects the schematic presentation of the study illustrating the input, process, and output.

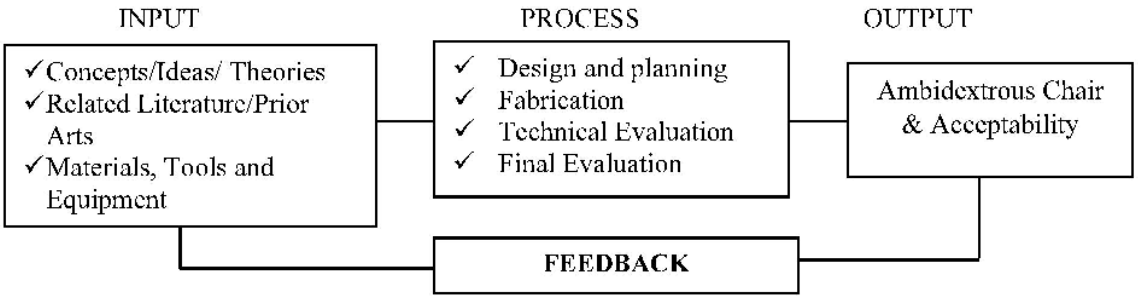

Figure 1: The Conceptual Model of the Study

The paradigm shows the three (3) processes of the Input-Throughput-Output system adopted in the study. The input of the study comprises the ideas, concepts, and theories; related literature and prior arts; and the usage of supplies and materials, tools, and equipment for the fabrication of the neutral chair. The inputs also include the mechanism for the design. This mechanism describes how the neutral chair will work for both right and left-handers. Ergonomics refers to the process of designing products so they fit the people who use them. Anthropometry refers to the study of measurements and proportions of the human body. This neutral chair systematically measures the physical properties of the human body, such as body size and shape. Anthropometry was also considered in the creation of the neutral chair. The researcher also included universal design as it describes the concept of designing all products and the built environment to be aesthetically and usable to everyone in the greatest extent possible, whatever their ages, ability, or status in life are.

The throughput consists of designs of the different components of the neutral chair, specifically the joining and other mechanical mechanisms which are appropriate to maintain the specifications of the design. The designs in fabrication are according to the standard specifications, integrating ergonomics, anthropometry, and universal design. The output shows the neutral chair's development to satisfy this study's significance. The connecting line from the input shows that after the fabrication of the neutral chair, actual testing or the Technical Evaluation was conducted to determine the level of acceptability of the design on usability, durability, and stability; and cost analysis for the future market. After the evaluation process, feedbacking was done.

Research Methodology

Research Design

This study utilized developmental research integrated with the field of instructional technology. In developmental research, there is an involvement in the creation of knowledge with the ultimate aim of

improving processes through instructional design, development, and evaluation. Developmental research, as applied here, has been defined as "the systematic study of designing, developing and evaluating instructional programs, processes, and products that must meet the criteria of internal consistency and effectiveness" (Seels & Richey, 1994).

Design Criteria

The ambidextrous chair was designed to use right and left-handed students in the classroom. This study, therefore, aims to design and evaluate the level of acceptability of the design on durability, usability, and stability of the ambidextrous while used by the students. The researcher used this design for educational purposes. The researcher found this chair more practical instead of creating chairs for both left-handed and right-handed consisting two different chairs for a future market.

In the production of the ambidextrous chair, the following were the design specifications based on the standards: Frame of the Ambidextrous chair. The Department of Education (2019), in its Supply and Delivery of School Furniture for Elementary, Junior, and Senior High Schools under the Basic Educational Facilities Fund (BEFF) C.Y. 2019 School Furniture Program, provides Technical Specifications on Education Facilities such as the student chair. As to the frame, the dimension must be 22mmF B.I. Pipe. The ambidextrous chair has 22mmF stainless pipe.

A. Backrest. This must be 22mmΦ B.I. pipe with support made of plywood 18mm thick marine plywood. The ambidextrous chair used high pressure laminate marine plywood with 18mmΦ thickness.
B. Seat board. This must be 22mmΦ B.I. pipe seat support and with seat chair made of 18mm thick marine plywood. The ambidextrous chair used high pressure laminated marine plywood with 18mm thickness.
C. Writing Pad. The table top has 18mm thickness with writing desk support of 22mmΦ B.I. pipe. The ambidextrous chair also has 18mm thickness with writing desk support of 22mmΦ B.I. pipe.
D. Moving Part. Wood and steel comprising 6mmΦ carriage round head nut and bolt of 25mmx50mmx2mm steel flat bar. In the ambidextrous chair, the same materials were also used as Wood and steel comprising 6mmΦ carriage round head nut and bolt of 25mmx50mmx2mm steel flat bar.

Design Plan Preparation

The design plan preparation of all components and parts of the neutral chair was based on the design criteria. The preparation consisted of the Preparation, Production, and Technical Evaluation phases. The researcher did specific steps in each of the different phases.

Parameters Analyzed

This study focuses on the ambidextrous chair, created for both the left and right-handers, considering the safety of student protection while delivering instruction inside the classroom. The neutral chair was evaluated in the level of acceptability of the design in terms of usability, durability, and stability. Other design considerations utilized in the design and production of the neutral chair were inspired by Mies Van der Rohe, specifically on the cantilever chair. The cantilever chair is the model from which this neutral chair was inspired. The chair uses a small gauge tubular steel frame that retains a specific amount of spring, providing extra comfort to the clean design. It is a marvelous example of Mies' use of a single closed structural line. It is also a chair whose seating and framework are not only supported by the typical arrangement of 4 legs. It is also held erect and aloft by one leg or legs attached to one end of a chair's seat and bent in an L shape. Thus, this structure also serves as the chair's supporting base.

Fabrication Procedure

The fabrication of the neutral chair was based on the model and final working drawings prepared and approved by the researcher. The expected procedures in the fabrication of the neutral chair were enumerated according to the specifications as required.

1. Materials Selection. In this process of creating the neutral chair, the researcher planned and selected the type of materials used such as metal. These were selected based on the standard and the durability even after prolonged use.
2. Purchasing the Materials. The availability of metal and other attachments were realized that the fabrication of the neutral chair observes the given steps to assure the safety of the users and durability of the furniture even after prolonged use.
3. Assembling the parts and other components. The fabrication of the neutral chair observes the given steps to assure safety and durability.
4. Testing and final assembling. This stage includes the attaching the different parts altogether of the neutral chair; testing the mechanism for the transposable left and right mechanism of the neutral chair, attaining its functionality primarily as a furniture for use of both the left and right handers.

Data Gathering Instrument

In order to answer the objectives of this study, this made use of the Design Criteria considered in the development of the ambidextrous chair, and the Assessment of the Technical Evaluation Panel.

Technical Evaluation

The ambidextrous chair was presented to the panel of experts for technical evaluation held last February 12, 2020 at ISAT – U, in which suggestions and recommendations were taken by the researcher for the finalization of the paper. The Technical Evaluation Panel was composed of four (4) experts in the field of architecture, interior design, and furniture production. Revision was considered after based on the recommendations of the Technical Panel.

Tools and Equipment

The tools and equipment as well as the supplies and materials are withheld in response to the requirements of this submission.

Results and Discussion

The ambidextrous chair has a special feature in the operation based on the design criteria for usability, durability and stability as evaluated by selected respondents. The neutral chair was estimated as 410mm in width, 450mm in depth, 450mm seat height, 200mm arm rest from the seat. A total 800mm chair height including the backrest.

Design of an Ambidextrous Neutral Chair in Terms of the Principles of Anthropometry, Ergonomics, and Universal Design

This section discusses the design of the ambidextrous neutral chair in terms of the design principles of anthropometry, ergonomics, and universal design. The brief descriptions of the component parts of the ambidextrous chair were illustrated in order to give clearer view to the users. Referring to the several views of the drawing, shown in the Perspective View in Figure 2, the ambidextrous chair comprises 33mm diameter G. I. (galvanized iron) post cantilever bended pipe frame welded with x frame seat made of 25.4mm angle bar for the seat frame. Framework is not supported by typical 4 legs but instead the legs are attached to one end of the chair's seat and bent in L shape to serve as a supporting base.

Figure 2: Actual Perspective View of the Ambidextrous Chair

The Top View illustration of the ambidextrous chair as shown in Figure 3. This provides the illustrated mechanism that the writing pad can be positioned on the right, front, and left side of the user.

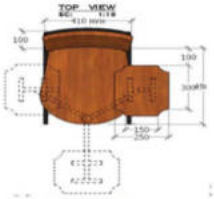

Figure 3: Top View of the Ambidextrous Chair

The Rear View Elevation shown in Figure 4, features the bended pipe support frame made of an endlessly shaped profile. The continuous profile is in a specially shaped detail consisting of a bended pipe support to support the bended plywood seat which measured 19.05mm x 410mm width x 450mm depth chair seat.

Figure 4: Front and Rear View Elevation of the Ambidextrous Chair

The Side Elevation as shown in Figure 5, presents the object achieved by the cantilever chair and solved with the features of Claim 3 Curved design and correct seat height, writing pad height are considered to provide back, arm and knee comfort to the user.

Evaluation of the Level of Acceptability of the Ambidextrous Chair in terms of Usability, Durability and Stability

Table 1 presents the level of acceptability of an ambidextrous chair in terms of Usability.

Table 1: Level of Acceptability of ambidextrous chair in Terms of Usability.

	Students (20)		Teachers (7)		Experts/Practitioners (8)		TOTAL	
	M	Interpretation	M	Interpretation	M	Interpretation	M	Interpretation
1) Is it available at any needed time?	4.63	VHA	5.00	VHA	5.00	VHA	4.88	VHA
2) Is it practicable to use in situation by someone in any period?	4.69	VHA	5.00	VHA	5.00	VHA	4.90	VHA
3) Is it serviceable to any type of person.	4.56	VHA	5.00	VHA	5.00	VHA	4.85	VHA
4) Is convenient to use in all ages?	4.60	VHA	4.85	VHA	4.85	VHA	4.77	VHA
5) Is it safe to anyone?	4.70	VHA	4.70	VHA	4.70	VHA	4.70	VHA
Average Mean	4.64	VHA	4.92	VHA	4.92	VHA	4.83	VHA

Scale: 1.00- 1.50 (Very Low Acceptability); 1.51- 2.50 (Low Acceptability); 2.51- 3.50 (Moderate Acceptability); 3.51- 4.50 (High Acceptability); 4.51- 5.00 (Very High Acceptability)

The result showed that the evaluators had rated the neutral chair with "very high acceptability" in terms of usability of the design of ambidextrous chair (M = 4.83). The results of the study revealed the very high level of acceptability of the Neutral chair as to its usability as evaluated by the students, teachers, and industry practitioner/ furniture experts.

Based on the different groupings, all evaluators rated the neutral chair with "very high level of acceptability" in terms of usability with means ranging from 4.56-5.00.
The respondents evaluated the availability of the furniture at any time. They believe that the proposed chair is made available for them to evaluate. Such chair was also practicable as shown by the result. It is practical as it can be used by both left and right handed. Its serviceability and convenience are suitable to all age group of users. The safety measures of the furniture are also made available and considered in the production of this furniture.

Table 2 presents the level of acceptability of an ambidextrous chair in terms of Durability.

Table 2: Level of acceptability of ambidextrous chair in terms of Durability.

	Students (20)		Teachers (7)		Experts/Practitioners (8)		TOTAL	
	M	Interpretation	M	Interpretation	M	Interpretation	M	Inter.
1) Materials has the ability to last?	4.90	VHA	4.71	VHA	4.88	VHA	4.83	VHA
2) Is it design Strong enough?	4.80	VHA	4.86	VHA	4.88	VHA	4.85	VHA
3) Is it strength								

capable to carry load of all ages?	4.60	VHA	4.86	VHA	4.88	VHA	4.85	VHA
4) Is strong enough to any activity, i.e. playing, standing, sleeping, sitting and others?	4.20	HA	5.00	VHA	4.00	HA	4.40	HA
5) Is capable against wear pressure as to its functions?	4.30	HA	5.00	VHA	4.00	HA	4.43	HA
Average Mean	4.56	VHA	4.87	VHA	4.53	VHA	4.65	VHA

Scale: 1.00- 1.50 (Very Low Acceptability); 1.51- 2.50 (Low Acceptability); 2.51- 3.50 (Moderate Acceptability); 3.51- 4.50 (High Acceptability); 4.51- 5.00 (Very High Acceptability)

As shown on Table 2, the level of acceptability of the ambidextrous chair in terms of durability, was "Very High" with overall mean of 4.65, with no revisions as evaluated by the students, teachers, and furniture experts/industry practitioners, As evaluated by the students and teachers, as well as furniture experts/industry practitioners, it has "Very High acceptability" with the mean of 4.56, 4.87, and 4.53 respectively with no revision and "Highly Acceptability with the mean of 4.65.

As to which durability characteristics the ambidextrous chair is very high in acceptability, the first three questions rated by the evaluators as VHA were Question 2: "Is the design strong enough?" with M=4.85; followed by "Is the material lasting?" with M=4.83; and "Is its strength capable to carry load of all ages?" with M=4.78. In the context of durability, the ambidextrous chair was evaluated high in terms of strength, ability to withstand the test of time, capability to carry any amount of load. This is because the prototype neutral chair was made of a sturdy GI pipe and molded plywood that is why it was rated as such. It implies that the furniture met the minimum expectation of the three groups of expert evaluators as they rated the furniture with "Very High Acceptability" as to the durability. However, it also has to be noted that as to items 4 and 5, "Is strong enough to any activity, i.e. Playing, standing, sleeping, sitting and others" and "Is capable against wear pressure as to its functions."

Furthermore, furniture expert suggested revising the design of the neutral chair, in terms of durability, the size of the user and the materials used must be looked into to assure the durability of the furniture.

As shown on the Table 3, the level of acceptability of the Neutral chair as to stability as evaluated by students, teachers, industry practitioners/furniture experts had an average mean of 4.25, 5.00, and 4.71 respectively. As a whole, the overall mean of stability was 4.65 with an equivalent rating of "Very High Acceptability."

Table 3: Level of acceptability of the ambidextrous chair in terms of Stability.

	Students (20)		Teachers (7)		Experts/Practitioners (8)		TOTAL	
	M	Interpretation	M	Interpretation	M	Interpretation	M	Interpretation
1) Is the quality of materials Strong and thick?	4.50	HA	5.00	VHA	4.75	VHA	4.75	VHA

2) Is the mechanism stable enough for such activities?	4.05	IIA	5.00	VIIA	4.50	IIA	4.52	IIA
3) Is safe to use for All school students?	4.10	HA	5.00	VHA	4.50	HA	4.53	VHA
4) Is its quality Unchangeable?	4.20	HA	5.00	VHA	4.00	HA	4.40	HA
5) Is the design of Bolts tough enough?	4.30	IIA	5.00	VIIA	4.90	IIA	4.73	IIA
Average Mean	4.25	HA	5.00	VHA	4.71	VHA	4.65	VHA

Scale: 1.00- 1.50 (Very Low Acceptability); 1.51- 2.50 (Low Acceptability); 2.51- 3.50 (Moderate Acceptability); 3.51- 4.50 (High Acceptability); 4.51- 5.00 (Very High Acceptability)

In terms of acceptability of the stability of the design of the neutral chair, the respondents agreed to the strength and quality of the materials. They also evaluated the mechanism's stability which indicates safety whenever used by the intended users. Based on the results of the evaluation the respondents also highly regarded the quality of the furniture and the design of the bolts as tough based on those who evaluated the design of the furniture. This neutral chair was also inspired by Mies Van der Rohe specifically his cantilever chair. In this neutral chair, the cantilever chair was the model in which it was inspired from. The chair uses a small gauge tubular steel frame that retained a certain amount spring providing extra added comfort to the clean design like the marvelous Mies' use of a single closed structural line. It is also a chair whose seating and framework are not supported by the typical arrangement of 4 legs, but instead is held erect and aloft by a single leg or legs that are attached to one end of a chair's seat and bent in an L shape, thus also serving as the chair's supporting base. Based on the results of the evaluation, these imply that the ambidextrous chair met most expectation of the students, teachers, and industry practitioners/furniture experts, and suggested to maintain the mechanism in stable condition as well as the functionality of the neutral chair as well as its uses. They have almost the same perception as they rated the neutral chair with "Very High Acceptability" as to the stability except only for the evaluation of the students in items 4 and 5. "Is the mechanism stable enough for classroom activities?" And "Safe to use for all school students" with M= 4.05 and M= 4.10 respectively.

Table 4: Level of General Acceptability of the Design of Ambidextrous Chair

Category	N	Mean	Description
A. Usability			
Students	20	4.70	Very High Acceptability
Teachers	7	4.70	Very High Acceptability
Furniture Experts & Practitioners	8	4.70	Very High Acceptability
B. Durability			
Students	20	4.56	Very High Acceptability
Teachers	7	4.87	Very High Acceptability
Furniture Experts & Practitioners	8	4.53	Very High Acceptability
C. Stability			
Students	20	4.25	High Acceptability

Teachers	7	5.00	Very High Acceptability
Furniture Experts & Practitioners	8	4.71	Very High Acceptability
Overall Mean	35	4.68	Very High Acceptability

Scale: 1.00- 1.50 (Very Low Acceptability); 1.51- 2.50 (Low Acceptability); 2.51- 3.50 (Moderate Acceptability); 3.51- 4.50 (High Acceptability); 4.51- 5.00 (Very High Acceptability)

The result of the study showed that the level of acceptability of the design on usability, durability, and stability of the Neutral chair as evaluated by students, teachers, and furniture experts was "Very High" with an overall mean of 4.65 This means that the design of the ambidextrous chair is very highly appropriate as to the functions or purpose and few recommendations are needed as to the dimensions, materials, and mechanisms.

The design on usability, and durability, and stability as evaluated by students, teachers, and furniture experts/industry practitioners was also "Very High Acceptability" with the mean scores of 4.83, 4.65, and 4.65 respectively. All the rest were "Very High Acceptability" except for stability as evaluated by the students. It was only evaluated as "Highly Acceptable."

It simply means that the ambidextrous chair the neutral chair met the acceptability criteria of the users with few recommendations as to how the furniture can be perfected based on the average user. The recommendations were:

- The design of the chair must consider the weight and size of the users, additional length for the arm full rest, the arm desk should be bigger, the edges must be softened, and may be adjusted to accommodate 8 x 5 by 11 paper.
- There is a need to adjust the arm rest higher too as well as adjust angle at the foot back to lessen the wobble when leaning at the back.
- There are positive comments too with regard to the neutral chair. These are: Very impressive especially for left handers and furniture is stable and sturdy.

Based on the overall evaluation, the design on usability, durability, and stability of the neutral chair was evaluated as "Very High Acceptability."

Conclusions

Based on the findings, the following conclusions were drawn:

1) The design of the ambidextrous chair has the following claims:

a) **Claim 1**.The neutral chair armrest mechanism comprising:

A chair with horizontal back support frame extending upwardly 4" away from the rear seat, a rotational mechanism welded under the seat base defining a longitudinal axis extending between an upper and lower connector, the upper connector attached to the horizontal seat frame and the lower connector serves as a holder to support the rotational arm ring base, such rotational arm ring can be pivoted with respect to the upper connector as a support, and lower connector as a holder of the said rotational arm ring. The neutral chair was designed to protect and accommodate the user. This is because the neutral chair can be ergonomically suitable to the intended user.

b) **Claim 2,** An expandable arm having a radial end connected to rotational ring arm attached to the upper and lower connector; to said mounting support for side- to-side reversible movement said top member is transposable with respect to side-to-side (left-to-right) reversible movement on said support means. As claimed in Claims 1 and 2, each the top member secures the arm rest when its transposed left and right.

c) **Claim 3,** wherein the extended arm mechanism comprises of 2 cylindrical pipes, the inner and outer pipes extending radially outwardly from the rotational arm ring and provides an option for comfortable space seat and arm rest required by the user. Outer extended arm having the axial hole

there through and adjacent the first receiving hole with the distance of 4" from the rotational arm ring. Holes were positioned over the inner pipe and can be extended away from the seat in the desired distance of the user. The movable inner arm allowing a straight movement. Holes are positioned upward with a slot for locking pin.

2) It was evaluated as "Very Highly Acceptable" by the three groups of expert evaluators; therefore, the neutral chair is very highly acceptable for classroom use, specifically for both left and right handers with slight revision for improvement. Experts/end users also supported the importance of the design for the furniture industry. As to the students, teachers, industry practitioners/furniture experts, the furniture is much helpful for the well -being of their students and for their learning productivity and to the future generation of both left-and-right handedness.

3) Efficiency was assured in the design to the ambidextrous chair integrating other design considerations in the design and production of the neutral chair such as ergonomics, anthropometry, and universal design. This is supported by Xie (2016) stating that design and art should always be created based on the needs of the society and solve the issues to provide people a better living environment."

Recommendations

The following recommendations were advanced:

1. The neutral chair is highly recommended for use in both public and private schools to ensure productivity of students who may be left or right handed.
2. The fabrication, improvement, and commercialization of the furniture is highly recommended especially for schools that do not have provisions for the left handers in the classroom.
3. The dissemination and publication of the results is highly suggested.
4. Drafting and filing of patent registration of the furniture is encouraged for posterity purposes.
5. This study should be submitted to Intellectual Property Office (IPO) for protection and for possible patent or utility model.
6. Other researchers are encouraged to conduct further study on furniture creation for improvement, safety, comfort and convenience of the user/s.

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Connectedness Matters: Exploring the Psychological Distance in Online Education

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ABSTRACT

With the growth of online education brought by the CoVID-19 pandemic is the challenge to be connected in the midst of isolation. This descriptive-correlational study examines the level of the psychological connectedness experienced by students in the online learning modality. To investigate this matter, 292 11th grade students from the University of San Agustin were invited to answer the adapted Online Student Connectedness Survey (OSCS). Mean, and t-test, and rank were used in the treatment of the data gathered. It was revealed that despite the challenges of the psychological distance perceived, students still experienced belonging and appreciation from the group which eventually led to meaningful learning experiences. A big part of such connectedness was due to the efforts of the instructors and other stakeholders in facilitating the opportunities for technology-assisted interactions and collaborations. On the other hand, no significant difference was noted on student connectedness in association to sex and area of locality.

Keywords: Online education, Psychological connectedness, Technology-assisted interactions and collaborations

Introduction

Since the CoVID-19 pandemic has changed the world in 2020, the day-to-day learning of students has been greatly affected by shifting to the online learning modality. According to the National Center for Education Statistics (2022), 77 % of the secondary public schools and 73% of the secondary private schools in the United States in the spring of 2020 were reported moving classes to online distance-learning formats due to the restrictions in face-to-face learning brought by the pandemic. In the Philippines, the Department of Education (DepEd) has likewise shifted to the distance learning modalities. In fact, majority of the public school students received instructions via modular print (79.17%) while most students in the private school opted for the modular online (41%). Some public and private school students preferred the other learning modalities such as blended learning, modular digital, radio/TV education, and homeschooling (Llego, 2021).

According to Paulsen (2002), online education is characterized as a two-way communication and distribution of some educational content with the use of a computer network under the influence of an educational organization and with the physical separation of teachers and learners. However, with some of the uncertainties in this educational response, it is also necessary to examine the underlying "psychological distance" in which Bălțătescu (2014) defined as the "cognitive separation between the self and other instances such as persons, events, or times." As used in this study, psychological distance refers to the student's perceived cognitive and affective detachment and isolation from their peers and instructors during synchronous and asynchronous classes. Song et al. (2004) on the other hand, added that students feel that lack of community, technical problems, and difficulties in understanding instructional goals are the major barriers for online learning. As a byproduct, students may have increased anxiety around academic performance, and reduced academic self-efficacy (Alemany-Arrebola et al., 2020). To address these issues, a feeling of comfort, social presence, and belonging were identified as important factors in fostering student connectedness. In fact, some studies have investigated these such as Arslan (2021), Russo & Benson (2005), and Richardson and Swan (2003).

Statement of the Problem

Efforts through studies have been exerted on the gaps in online education but only few have explored psychological distance or in any case, online student connectedness. It should be noted that the students' sense of belonging and engagement with the group is a predictor of academic outcomes (Wilson, 2016). Children who feel more connected to school are more likely to have better attendance and perform better academically (U.S. Department of Health and Human Services, 2009). All these provided the rationale for the study and may greatly benefit the teachers, students, administrators, parents, and future researchers. Hence, this study primary aims to determine the level of the psychological connectedness experienced by students in the online learning modality.

Research Questions

Considering the need to determine the level of student connectedness to address properly the underlying gaps, the following research questions were formulated:

1) To what extent do 11th grade senior high school students feel psychologically connected to their online learning community?
2) Which factor has the biggest influence on students' sense of connectedness?
3) Is there any significant difference on the psychological connectedness experienced by students in their online learning in association to sex and area of locality?

Framework of the Study

Student Connectedness is the feelings of involvement and closeness in a specific group, environment, or organization (Hagerty et al, 1993; Townsend & McWhirter, 2005). When online students feel connected to a learning community, or if they feel a sense of belonging at their institution, their satisfaction and academic performance are affected (Carter, 2019). This study is rooted primarily in social constructivism, but it has also examined other theories.

Social Constructivism

Social constructivism purports that human learning is constructed based on previous knowledge built by social interactions. Basically, Piaget (1969) and Vygotsky (1978) suggested that learning is an active process where students are viewed as peer educators who contribute to the learning experience by sharing their valuable experiences and diverse expertise. The latter believed that the community plays a central role in the process of "making meaning".

Sense of Community Theory

McMillan and Chavis (1986) defined sense of community theory as "a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together". It minimizes the limiting factors related to the electronic communication medium, such as isolation and the inability to meet face to face, and focuses more on the factors such as frequent interactions and group assignments, which lead to building a social connection between participants. Rovai (2002) recognized that the social presence of the instructor, which included frequent interactions and the organization of small group activities, mitigated feelings of isolation among students.

"Nature" and "Nurture" in Socialization

The biological theory looks scientifically into why people behave as a typical gender in the learning community as a result of the genetic make-up. For instance, men find same-sex social interactions less rewarding than women due to the actions of oxytocin, brain mechanisms that determine the rewarding properties of social interactions (Georgia State University, 2019). In contrast with the biological influences on gender is the social identity or "that part of an individual's self-concept which derives from his knowledge of his membership of a social group (or groups) together with the value and emotional significance attached to that membership" (Tajfel, 1981). Research has shown that men's activities tend to relate in technology and action, whereas women are inclined to nurturance and beauty and therefore has less confidence in their ICT abilities (Blakemore and Centers, 2005; Kollmyer et al., 2018). Moreover, newer studies support that computer use for both education and entertainment purposes is more frequent among men (Drabowicz, 2014) while women seem to use computers and the Internet more for communication and social networking (McSporran & Young, 2001).

E-mmediacy Theory

Introduced in 2006, e-mmediacy theory has been used to explain feelings of social connectedness that students and faculty acquire through the technologically enhanced online learning environment. E-mmediacy theory draws from Mehrabian's (1969) theory of immediacy, which examined the verbal and nonverbal cues people use to reduce the perception of physical distance between them in face-to-face communication. These strategies include frequent interactions, the encouragement of participation, and the ability of the instructor to provide support for technology. The inclusion of these strategies is linked to learners' positive feelings about the course, fellow students, and the instructor (Slagter van Tyron & Bishop, 2006).

Bolliger and Inan (2012) explained that connectedness encompasses the perception of students on four factors (comfort, community, facilitation, and interaction and collaboration) which are anchored to some social learning theories. With the possible influence of some demographic variables to the student connectedness, the given framework was designed.

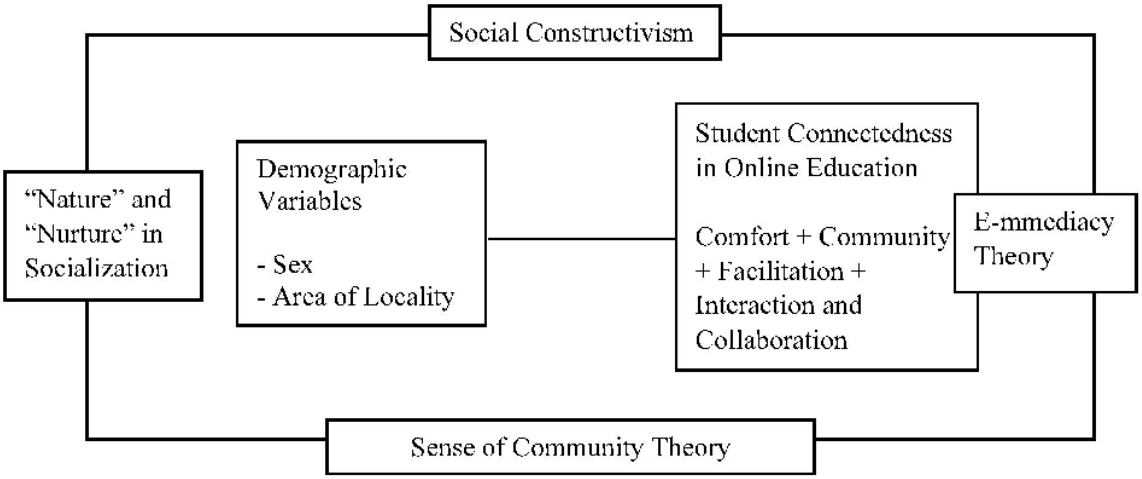

Figure 1: Framework of the Study

Methodology

Participants

The participants of the study are the 292 11th grade students of the University of San Agustin-Senior High School (USA-SHS) who opted for the online learning modality at the time of the administration of the instrument. The selection of participants was done through purposive sampling.

Table 1: Distribution of participants in accordance to sex and area of locality

Sex		Grade Level	Area of Locality	N
F	M	11	Rural Urban	
210	82	292	175 117	292

Instrument and Data Analysis

The research instrument consists two sections. The first part is the demographic profile of students: name (optional), sex, grade level, and area of locality. The second part is the adapted Online Student Connectedness Survey (OSCS) by Bolliger and Inan (2012). Some terms in the original instrument were modified to make the statements aligned to the Philippine context. Respondents were asked to choose the degree on how they perceive each statement under each factor. The measurement levels are strongly agree (5), agree (4), partially agree (3), disagree (2), and strongly disagree (1).

To analyze the data gathered, mean, standard deviation, rank and t-test were used then the result per factor in relation to each demographic variable and the overall findings are discussed.

Results

Table 2: Levels of online student connectedness in terms of factor

Item	Mean	Qualitative Description
Entire group	3.5124	Very connected
Comfort	3.4022	Fairly connected
Community	3.0818	Fairly connected
Facilitation	3.8623	Very connected
Interaction and Collaboration	3.7033	Very connected

Table 2 shows that generally, students felt very connected to their online learning community (M=3.5) and likewise in the factors facilitation (M=3.86) and interaction and collaboration (M=3.70) specifically. However, fair connection was noted on comfort (M=3.40) and community (M=3.08).

Table 3: Levels of online student connectedness in terms of comfort in association to sex and area of locality

Item	Mean	SD	Qualitative Description
Entire group	3.4022	.76662	Fairly connected
Sex			
Female	3.4006	.75897	Fairly connected
Male	3.4062	.79323	Fairly connected
Area of Locality			
Rural	3.3829	.16944	Fairly connected
Urban	3.4315	.16705	Fairly connected

As Table 3 indicates, students experienced fair connection in terms of comfort when engaging on their classes online (M=3.40), and likewise regardless of their sex: female (M=3.40) and male (M=3.41) and their area of locality: rural (M=3.38) and urban (M=3.43).

Table 4: Levels of online student connectedness in terms of community in association to sex and area of locality

Item	Mean	SD	Qualitative Description
Entire group	3.0818	.16833	Fairly connected
Sex			
Female	3.0871	.16561	Fairly connected
Male	3.0682	.17597	Fairly connected
Area of Locality			
Rural	3.0737	.16944	Fairly connected
Urban	3.0940	.16705	Fairly connected

Table 4 shows that students felt fairly connected to their online learning community (M=3.08), and the same is true regardless of their sex: female (M=3.08) and male (M=3.07) and their area of locality: rural (M=3.07) and urban (M=3.09).

Table 5: Levels of online student connectedness in terms of facilitation in association to sex and area of locality

Item	Mean	SD	Qualitative Description
Entire group	3.8623	.83182	Very connected
Sex			
Female	3.8838	.84003	Very connected
Male	3.8077	.81609	Very connected
Area of Locality			
Rural	3.8138	.78003	Very connected
Urban	3.9361	.90550	Very connected

Table 5 indicates that in terms of facilitation, students felt very connected (M=3.86), and likewise when they were grouped according to their sex: female (M=3.88) and male (M=3.80) and their area of locality: rural (M=3.81) and urban (M=3.94).

Table 6: Levels of online student connectedness in terms of interaction and collaboration in association to sex and area of locality

Item	Mean	SD	Qualitative Description
Entire group	3.7033	.85161	Very connected
Sex			
Female	3.7152	.85930	Very connected
Male	3.6731	.83926	Very connected
Area of Locality			
Rural	3.7081	.81074	Very connected
Urban	3.6959	.91598	Very connected

As Table 6 shows, it was identified that students were very connected to their online learning classes in terms of interaction and collaboration (M=3.70), and same is true regardless of their sex: female (M=3.71) and male (M=3.67) and their area of locality: rural (M=3.70) and urban (M=3.70).

Table 7: Significant difference on the student connectedness in association to sex

Item	t	df	Sig.	Interpretation	Decision
Comfort	-.045	182	.778	Not Significant	Do not reject H_o
Community	.687	182	.744	Not significant	Do not reject H_o
Facilitation	.558	182	.787	Not significant	Do not reject H_o
Interaction and Collaboration	-301	182	.935	Not significant	Do not reject H_o

p=0.05

It can be noted from the results shown in Table 7 that there was no significant difference on student connectedness and sex: comfort (t= -.045, p>.05), community (t= .687, p>.05), facilitation (t= .558, p>.05), and interaction and collaboration (t= -301, p>.05).

Table 8: Significant difference on the student connectedness in association to area of locality

Item	t	df	Sig.	Interpretation	Decision
Comfort	-.420	182	.946	Not Significant	Do not reject H_o
Community	-.799	182	.818	Not significant	Do not reject H_o

Facilitation	-.975	182	.388	Not significant	Do not reject H_o
Interaction and Collaboration	.095	182	.402	Not significant	Do not reject H_o

p= 0.05

The results in Table 8 indicate that there was no significant difference on student connectedness and area of locality: comfort (t= -.420, p>.05), community (t= -.799, p>.05), facilitation (t= -.975, p>.05), and interaction and collaboration (t= 095, p>.05).

Discussions

The following discussions were made based on the results and the related studies:

First, the students were identified to be psychologically very connected to their online classes particularly due to facilitation and interaction and collaboration factors. This result, however, contradicts some investigations done in the pre-pandemic years asserting that students who enrolled in online courses were less connected to their learning community, felt a greater sense of social isolation, and dissatisfied in quality of learning and feedback (Bolliger & Inan, 2012; Irani et al, 2014; Rovai, Wighting & Liu, 2005). In another study conducted in various schools, it was also found out that students had a low sense of connectedness to their non-traditional instruction which resulted to a cycle of misbehaviors (Black, 2016; Cagle, 2017; Cameron, 2006). While it is true that a great deal of challenges was faced before as online learning was already adopted by schools but just as a secondary option to the in-person classes, and given the limited web-based materials and device features, it is to be noted also that online learning became the immediate response to the global education crisis and has now become the "new normal." This has forced the stakeholders to develop and improve continuously the online routines of schooling such as online admission and enrollment, video conferencing, assessments in the learning management system (LMS), and online feedback sessions. These eventually has led to a higher demand of subscriptions to online learning softwares, video conferencing applications, computers, mobile devices and Internet subscription plans. These efforts of the stakeholders to continuously ensure quality learning and inclusivity could be a reason why the results in the recent studies had gradually changed. In an exploratory research conducted by Conner (2019), it was identified that students had a moderately-high average of online student connectedness. Collaborative or group work through the facilitation of the instructor was identified to be the most influential aspect in fostering sense of belonging and connectedness. An attempt was also made by Jamison and Bolliger (2019) to further investigate the matter and reported a moderate level of student connectedness with a desire for more interactive instructors who will provide more timely responses to student communications. An ongoing change of results was noted in the succeeding years in the investigations of Banks-Weston (2020) and Khan et al. (2021) in which the findings demonstrate that students perceived a high level of engagement and openness during online classes and that interactive instruction was positively associated with feelings of interest and belonging.

Second, the factor which has the biggest influence in the students' sense of connectedness is facilitation. It is always emphasized that the teacher is the heart of the teaching-learning process and the role as a facilitator is crucial in fostering not only effective instruction but also a quality and healthy learning experience where inclusivity and communication are actualized. "Teacher presence" increased connectedness (Stone & Springer, 2019). It is the teacher who is the key person whose mere presence at the least, encourages students to experience an engaging and supportive virtual learning environment. As a facilitator of learning, the teacher is responsible for carefully designing the online course (topics with contextualized examples and engaging technology-assisted activities), initiating interaction and collaboration (asking questions and creating virtual rooms for group discussions), suggesting opportunities for two-way communication (online chat rooms, audio and video conferencing), and

organizing feedback sessions (virtual teacher-student and teacher-parent conferences). Moreover, students feel valued when teachers recognize their individual abilities and guide them along the way. Vygotsky (1978) explained in his concept of zone of proximal development (ZPD) that students can experience a meaningful learning by accomplishing a specific developmental level and attain the next higher level through problem solving under adult guidance or in collaboration with more capable peer.

Third, no significant difference was identified on the psychological connectedness in association to sex. This coincides to the investigation conducted by Abimbola and Ugbede (2018) and Nolan (2021). However, these results are inconclusive as some researchers like Carney et al., (2020) and Tomul and Savasci (2012) claimed that females have meaningful sense of connectedness which led to increased success and fewer behavior issues than males and that males are more likely to be referred to law enforcement after participating in violence. This can be explained by the biological theory and the social identity theory wherein the former explains one's behavior as a result of his or her genetic make-up and the latter purports that one's self-concept comes from the typical gender role determined by his or her group. On the other hand, no significant difference was also seen on the psychological connectedness when associated to the students' area of locality. This is in contrast to most studies like Macintyre and Macdonald's (2011) which concluded that the limited Internet access from homes in rural areas contribute to the gaps in student engagement and performance in online learning. Intrinsic factors such as the degree of motivation and enthusiasm are typically more influential than extrinsic factors such as family, income, nature of location, community, etc. This is possibly the reason why the area of locality does not affect significantly the students' sense of belonging and engagement to the online learning environment. If students in rural areas are still eager to enroll in online classes given the limited Internet access, some alternatives are given to them like opting for customized schedule of virtual meetings, communications through texts, and offline e-learning materials. Such measures help maintain the connectedness and engagement of students in the class. On the other way around, students in urban areas have good Internet access but some may not be motivated enough to participate or at the least attend online classes because they find it boring or they are distracted by other things seen online. These could explain why area of locality may not have a significant influence to online student connectedness.

Conclusions and Recommendations

During this time of ongoing adjustments to a more flexible mode of learning, it is understandable to have students who feel lonely and psychologically disconnected from the rest in the online class. Most of them have adjusted well enough but some may have a challenging time to be participative in the virtual communications and activities or merely be present in the class and thus affects class attendance and performance.

Such reduced sense of connectedness can be the result of their various experiences in the virtual classrooms, and thus, the role of the teacher as the key person and facilitator of every interaction and collaboration opportunities in the online learning community is very crucial.

The possible influence of the varying demographic characteristics such as sex and area of locality to student connectedness are inconclusive. Some researches support the notion of the relationship but others concluded otherwise.

Psychological distance is a less explored area in education but there is no denial that it greatly affects student performance and academic achievement. A proposed initial step to eliminate this educational gap is for the teacher to know better the students. It is suggested for the teacher, therefore, to check connectedness as a possible factor for student tardiness, absenteeism, and poor class participation and academic performance. Running a test through written questionnaire/oral interview is highly recommended. Once the results have been analyzed (ex. how many of them have poor connectedness, who are those students, etc.), the teacher can do interventions depending on the factors or areas that

contribute to such gap. If the cause/s identified is/are on any of the factors: comfort, community, facilitation, and interaction and collaboration, the teacher, as the key person, is suggested to reflect on his or her ability to create opportunities for student engagement such as selecting or designing online activities which recognize their passions, questions which are contextual, virtual rooms for group discussions, online chat rooms, audio and video conferencing for communication engagements, and virtual feedback sessions. Other opportunities such as praising them verbally with bodily cues, sending messages with emojis, and choosing them to be leaders in the area they shine could help them feel that they are belonged and appreciated. As for online students, they are encouraged to do initiatives to communicate with their teachers and peers. Asking and answering questions, sharing reactions, or simply greeting everyone in the class may help in encouraging themselves to lessen their sense of isolation. After all, communication and interaction are a two-way process. For administrators meanwhile, they can organize trainings and workshops for the teachers on online classroom management, email management, feedback techniques, learning management system (LMS), technology-assisted games and learning materials, etc. Furthermore, parents can help also their child increase and maintain the sense of connectedness to the group by providing the necessary physical means for actualizing productive virtual interactions such as computer or mobile device, Internet access, headset, distraction-free space as a venue for online classes, and other school materials. Parents are also recommended to be responsive to the teacher's communications so that they can also give the necessary praise to their child for having such good performance or advice in case some difficulties were determined. Finally, for future researchers, since limited studies explored the psychological distance in online education, it is best recommended to conduct more investigations and develop scales and questionnaires that would measure online student connectedness considering the other internal factors (ex. self-esteem, language competence, personality, and values) and external factors (kind of equipment used, Internet access, and physical environment). Self-reports are also suggested to be included.

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Promoting Tourism Using Digital Technology at Archaeological Sites for Students with Disabilities

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ABSTRACT

This study was conducted to 1) develop the digital technology to promote tourism at archaeological sites for students with hearing impairments 2) determine the efficiency of digital technology to foster tourism at archaeological sites for students with hearing impairments and 3) examine the satisfaction of using digital technology to promote tourism at archaeological sites for students with hearing impairments. The population and sample group consisted of the 1) population was deaf students in secondary levels from schools for the deaf 2) sample group was 40 deaf students and were selected by purposive sampling from 4 schools. The digital technology in promoting their accessibility to archeological sites was videos with sign language interpretation and captions. The research tools were categorized into three parts: 1) the digital technology to stimulate tourism at archaeological sites for students with hearing impairment, comprised of video footage related to archaeological sites in Thailand, sign language interpreter, and caption 2) a pre-and post-test of the usage of digital technology to promote tourism at archaeological sites for students with hearing impairments and 3) a satisfaction questionnaire for students with hearing impairments on the use of digital technologies for tourism promotion at historical places that asked the students via Thai sign language interpreter. The results found that the average satisfaction in using digital technology was at the highest level, which was = 4.98, SD = 0.05. The study concluded that digital technology for deaf students could be effective to facilitate their access to archaeological sites.

Keywords: Digital technology, Promoting tourism, Students with disabilities

Introduction

Tourism is considered a type of activity that contributes to the development of both physical and mental health, as well as relaxation and enjoyment. The United Nations World Tourism Organization (UNWTO) announced 2016 as the Year of Accessible Tourism, establishing tourism to be equally accessible to all (Accessible Tourism). It is an aspect in terms of expanding the possibility for all groups of people, including the elderly and persons with disabilities, to have access to tourist destinations (Allan, 2013). A plurality of organizations has focused on the rights of people with disabilities, including the freedom to travel because tourism is a fundamental human right that provides individuals with freedom and confidence. Additionally, a vast number of research studies have examined various elements of tourism for individuals with disabilities, including their current needs and travel. This is attributable to the reality that persons with disabilities have similar demands to those without disabilities when it comes to travel and tourist activities should not confine or disallow the participation of people with disabilities, but people with disabilities need tourism as well. Because of the many benefits of tourism and enhancing people's quality of life in plenty of aspects, it is irrefutable that organizing tourism for people with disabilities is significant (Allan, 2013; Michopoulou, et al., 2015). However, people with disabilities are special in each kind of disability. Tourism services must pay attention to and support the differences to provide them with access to tourism.

Currently, technology is increasingly being employed in tourism, to provide tourists with convenient and quick access to information about tourist attractions, particularly tourists with disabilities (Mayordomo-Martínez, et al., 2019). People with hearing impairment, are unable to acquire information through their hearing causing constrained access to information. Hearing loss makes it impossible to communicate with others by speaking. Sign language communication is utilized to convey communication between deaf people. Communicating in sign language with a sign language interpreter will enable the general public to communicate with the deaf. For the deaf, technology can therefore empower those with hearing impairment to learn a language.

Studies show that digital technology can considerably aid the development of skills in people with disabilities. The employment of multimedia technology, in particular, is noteworthy. They are developed to make people easily obtain information (Deb & Bhattacharya, 2018). Multimedia that consists of photographs, animations, and texts can promote learning as well. This is because the hearing impaired uses visual perception, which relies on the visual senses for their perception. The images, therefore, influence perception and is better able to remember the tangibles in concrete forms rather than in abstract. The use of images to convey meaning and explain texts leads to higher comprehension and learning, which encourages the viewer to be creative and continuously stimulates the learner's imagination. Learners can conceptualize these more easily than the use of words. It also builds an atmosphere in language learning for deaf people.

Thailand, on the other hand, does not currently use much technology to increase access to information at tourist attractions for the hearing impaired. The government is interested in accessing the rights and utilization of information and has enhanced services in particular the production of closed captioning on television programs. However, there have been no technology, utilities, or other services in tourist destinations, particularly historic sites, that facilitate access to information for tourists with hearing impairments. As a result, they are unable to gain access to historical or general information.

Because of the issues and scenarios described above, there is still a scarcity of technology that can assist them in gaining access to information. They also miss out on valuable historical tourism knowledge as a result of this. Therefore, this study aims to create digital technology for a group of deaf students to access information related to historic sites. The digital technology developed in this research is anticipated to help tourists, who are deaf students in this study, to better access and understand historical site information.

Definitions of terms

The definitions of terms were created based on specifications in accordance with the research objective, research scope and the sample group.

Digital technology refers to the technology devised in this research to assist students with hearing impairments to access information about archaeological sites in Thailand. It comprises four parts of the facility: a video exhibiting the history of the site, a screen with Thai sign language interpretation, a caption, and a QR Code about the archaeological sites.

Access to information on archaeological sites refers to the extent the hearing-impaired students can search and obtain information about 10 archaeological sites in Thailand: Wat Phra Si Rattana Satsadaram, Wat Phra Chetuphon Wimon Mangkalaram Ratchawaramahaviharn, Wat Arun Ratchawararam Ratchawaramahaviharn, Wihan Phra Mongkhon Bophit, Wat Phra Si Sanphet, Wat Yai Chaimongkol, Wat Phanan Choeng, Wat Chaiwatthanaram, Wat Ratchaburana, and Wat Phra Pathom Chedi Ratchaworamahaviharn.

Archaeological sites refer to 10 tourist attractions with an intriguing history and are renowned tourist attractions in Thailand: Wat Phra Si Rattana Satsadaram, Wat Phra Chetuphon Wimon Mangkalaram Ratchawaramahaviharn, Wat Arun Ratchawararam Ratchawaramahaviharn, Wihan Phra Mongkhon Bophit, Wat Phra Si Sanphet, Wat Yai Chaimongkol, Wat Phanan Choeng, Wat Chaiwatthanaram, Wat Ratchaburana, and Wat Phra Pathom Chedi Ratchaworamahaviharn. These archaeological sites have sign language that will make it easier for deaf people to understand stories about the archaeological sites.

Students with a disability refer to 40 students with hearing disabilities who are attending secondary education in a specialized school for the hearing impaired.

Research Objectives

Based on the defined aim of the study, the objectives of this research were to (1) develop digital technology to promote tourism in archaeological sites for students with hearing impairments. (2) determine the efficiency of digital technology to foster tourism in archaeological sites for students with hearing impairments and (3) examine the satisfaction of using digital technology to promote tourism at archaeological sites for students with hearing impairments.

Methodology

The population consisted of deaf high-school students attending schools for the hearing-impaired in Bangkok and the vicinity. The sample group consisted of deaf students in secondary schools who studied at special schools for hearing impairment. The samples were selected by a simple random sampling; 10 deaf students per school were selected, equalling 40 students in total. In totality, 40 deaf students participated in this current study voluntarily.

Research instruments in the data collection

To accomplish the research study and its findings, the key research instruments included:

1. The digital technology was developed to stimulate tourism in archaeological sites for students with hearing impairment, comprising of video footage related to archaeological sites in Thailand, sign language interpreter and caption.

2. A pre-and post-test of the usage of digital technology to promote tourism in archaeological sites for students with hearing impairments. The test includes 50 items, which relate to stories from 10 archaeological sites.
3. A satisfaction questionnaire for students with hearing impairments on the use of digital technologies for tourism promotion at historical sites. The questionnaire was comprised of 20 questions and was divided into two sections. The questions in the first section were related to the respondent's demographic characteristics. In the second section, the respondents were asked about their satisfaction with using digital technology to promote tourism in archaeological sites for students with hearing impairments that were comprised of 12 questions. The question relates to general characteristics of digital technology, such as the size of the caption and Thai sign language interpreter. Moreover, the question asked about their satisfaction with the content of digital technology, for example, the content is accurate comprehensive with the attractions, easy to understand and time appropriate.

Development and assessment of research tools

In terms of the development and validation of the questionnaire, which are on the state and satisfaction regarding the digital technology in archeological tourist attraction promotion for students with the hearing impairment, key steps were conducted as follows:

1.1 Explore deaf concepts and theories, as well as tourism for the deaf, information access difficulties in tourism for the deaf, historical places, digital technology for information access in tourism, and technology facilitating the deaf.

1.2 Study the opinions of consultants and experts in the preparation of the questionnaire. The experts in digital technology and tools participating in this study consisted of one specialist in hearing impairment, one technologist, one sign language expert, one linguist, and one deaf person; the total number of participating experts were 5. Each of the experts was crucial in developing the digital technology to suit both the hearing-impaired special characteristics, the technology to be used for the hearing impaired, as well as the sign language specialist to establish the communicative content in the developed digital technology for the samples of deaf participants and the deaf people who understand a large number of dimensions of deaf people better than people with normal hearing.

1.3 Draft an initial version of the questionnaire and had experts determine the appropriateness of the content and its validity (Index of Consistency, IOC), which is set at 0.5 or higher.

1.4 Modify the questionnaire according to the experts' feedback and used the modified and validated version of the questionnaire with the sample group of 40 participants.

The development of the digital technology to promote tourism in archaeological sites for students with hearing impairments was conducted according to the following steps:

- **Step 1:** Studying the feedback of consultants and experts on the development of digital technology to promote tourism at archaeological sites for students with hearing impairments. Next, study and explore information at archaeological sites and use the data from the survey to analyze and create a model of digital technology for this study, which consisted of making a video of archeological tourist attractions and preparing sign language. Then, implement the demo to pilot with people with hearing impairment who were not in the sample group and conducted interviews with them to compile recommendations for improvement and development. After that, amend the demo according to the feedback and insert a caption about the historical site video.
- **Step 2:** Organizing a focus group to allow experts and interested people, who were hearing impaired and not hearing impaired, to collectively review, and advise on the developed digital technology.
- **Step 3:** Improving the digital technology developed in this study according to the advice of experts and pilot samples.

- **Step 4:** Preparing the QR Code on digital technology developed in the study, which is a video portraying the stories of 10 archaeological sites with sign language and captions. Then, installing the QR Code in tourist attractions, for example, installation at, Wat Pra Kaew (the Temple of Emerald Buddha Image), etc. The QR Code has also been published on websites and online media so that it can be tested by interested people who are unable to travel to the actual attractions.

Data Collection and Analysis

The data collected in this study consisted of the following whereby the researcher conducted all steps to communicate with the deaf sample group through a sign language interpreter, who was a teacher in each school where the samples were studied, to communicate between the researcher and the sample to understand the research instruments following the study objectives. Data collection began with pre-tests. Then, the researcher piloted the digital technology for ten stories and two times for each story, totaling 20 times. Scores were collected a post-study test when the digital technology was tested at 10 stories. Regarding the final data collection process, the researcher had the sample fill in the satisfaction questionnaire on the use of digital technology. The statistical tools for analyzing the data were mean and standard deviation and Paired Samples T-Test.

This study was approved by the Human Research Ethics Committee to comply with human research ethics which places a great emphasis on the protection of the rights, dignity, and well-being of human participants in the study. This will make the study to be congruent with ethics, establishing academic credibility, and international recognition. People with disabilities are a vulnerable group. In the study, it is well understood that people, especially children, cannot make decisions on their own. Therefore, conducting research requires considerable thought and great awareness. The researcher had been aware of the ethical issues of human research in this study. We explained and informed participants of the objectives, research methods, and keep participants' information confidential. The findings are collectively presented as an overall picture. Participants can withdraw from the study at any time and researchers had participants sign a consent form to participate in the research prior to data collection.

Research Results

According to the results of the assessment of the suitability of digital technology to promote tourism at archaeological sites for students with hearing impairments, it was found that the content validity was congruent with the study objectives among 12 qualified questions. In this regard, it also found that most question items were valid, with IOC 1, out of 11, whilst there was one item having IOC 0.6, which was item 11 (the content modernity). In terms of the consistency of the total content of digital technology to promote tourism at archaeological sites for students with hearing impairment, it was 0.97, which meant that the digital technology used in this study had an excellent content alignment. The study used the test having the content selected from digital technology, which consisted of videos, sign language, and captions that feature 10 archaeological sites, and 10 stories in total. The content was then selected to construct 5 questions out of 10 stories, 50 questions in total. It used E1/E2 = 80/80 Efficacy values for a sample of 40 deaf people.

Table 1: Analysis results of E1/E2 compared with the evaluation criteria

Assessment item	Analysis results of E1/E2 compared with the evaluation criteria		
	Results	Assessment criteria	Assessment results
Efficiency of E1	86.1	80	Pass
Efficiency of E2	90.05	80	Pass

Calculation of the efficiency values of E1/E2 during and after the experiment found that the values on the use after the experiment were higher among all samples. As a result, the efficiency value was higher each time the experiment was given. The efficacy values during and after the experiment met the set criteria. Because the use of digital technology required skills and learning, the efficiency value should therefore be greater than 80%. The results obtained from the efficiency test of the E1/E2 were higher than the specified value, which was equal to E1 = 86.1 and E2 = 90.05. It underscored that the digital technology in this study had been effective and passed the 80/80 set criteria. This shows that the digital technology to promote tourism at archaeological sites for students with hearing impairments is effective according to the set criteria.

Table 2: The results of the analysis indicated differences in mean scores for each of the deaf students before and after the experiment with the digital technology with Paired Samples Test

Paired Samples Test							
		Paired Differences			t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean			
Pair 1	pre - post	-30.075	.350	.055	-543.602	39	.000

The results revealed the difference in the mean scores before and after the experiment of the digital technology to promote tourism at archaeological sites for students with hearing impairments. It was found that the mean difference of each person who tested the use of the digital technology before and after the assessment was statistically different at 0.05 level, t = -543.602, p-value = 0.00.

Table 3: Means and standard deviation of the sample's satisfaction assessment of the use of digital technology to promote tourism at archaeological sites for students with hearing impairments

Items	**Satisfaction level** (N=40)		
	$\bar{X}$	**SD**	**Interpretation**
Physical characteristics of digital technology for the deaf in promoting access to information			
1. The appeal of the developed technology	5	0	Highest
2. The appropriateness of the caption font size	4.8	0.405	Highest
3. The appropriateness in passing on the complete content by using captions	5	0	Highest
4. The appropriate size of the sign language interpreter screen	5	0	Highest
5. The suitability of conveying accurate and complete content by using sign language	5	0	Highest
6. The simple technological design and the easiness to use.	5	0	Highest
Content			
1. The content is relevant to the objectives	5	0	Highest
2. The content is accurate and comprehensive.	5	0	Highest
3. The content sequencing supports a better understanding of the content.	5	0	Highest

Items	Satisfaction level (N=40)		
	$\bar{X}$	SD	Interpretation
4. The content is properly compact.	5	0	Highest
5. The content is up to date.	4.95	0.221	Highest
6. The videos and illustrations help to portray the clear meaning.	5	0	Highest

According to Table 3, the results showed that the average satisfaction of the participants using the digital technology developed in this research was at the highest level. The item with the lowest mean was the physical aspect of digital technology, which asks about the appropriateness of the caption font size ($\bar{X}$ = 4.80, SD = 0.405). For the other items, the mean was at the highest level ($\bar{X}$ = 5.0, SD = .00) as shown in Table 3.

Table 4: The results of the satisfaction assessment of the sample in the use of digital technology for the deaf in promoting access to information at archaeological sites and tourist attractions

Aspects	satisfaction level (N=40)		
	$\bar{X}$	SD	interpretation
1. Physical and digital technologies in promoting access to information	4.97	0.07	Highest
2. Content	4.99	0.04	Highest
Total	4.98	0.05	Highest

As shown in Table 4, the results of the analysis of the whole questionnaire, yielded $\bar{X}$ = 4.98 and SD = 0.05. In terms of each aspect, it was found that means of the subjects' satisfaction with using digital technology was at the highest level. The aspect with a low mean was 1s) Physical and digital technology for the deaf in promoting access to information was at $\bar{X}$ = 4.97, SD = 0.07). As for the second aspect (the content), the mean was at the highest level, which was $\bar{X}$= 4.99, SD = 0.04.

Discussion

Designing digital technology for the deaf to promote access to information in video format, it consists of 6 steps: 1) Choose 10 historical and tourist attractions, 2) Scriptwriting, 3) Shoot video in archaeological sites, 4) Edit videos to comply with gestures of sign language interpreters, 5) Add captions in the video, 6) Bring the videos with sign language and captions to create QR Codes and distribute them on social networks. The researcher selected prominent tourist destinations in Thailand, which were full of captivating stories in numerous aspects to construct the developed digital technology. They could help deaf people have access to tourist information and historically significant knowledge about archaeological sites. Rodsawang (2018) researched the scriptwriting guidelines for full-screen sign language television programs for the hearing impaired, which is consistent with the archaeological sites chosen to build digital technology in this study. Writers of sign language television programs must be aware of the constraints of communication as well as the nature of deaf individuals. The principles of producing a sign language television program must be consistent with that production planning and should be based on the concept of "supporting persons with disabilities to live in a society together with the general public," which incorporates content selection (Research). They should choose content that is relevant to persons with disabilities and includes content that teaches them useful life skills. As shown in this study, the content selection of content produced into digital technology greatly boosted deaf people's access to knowledge in tourist places, which they could then utilize in their daily lives.

In this present study, the developed digital technology was designed to portray the pictures of the archaeological sites and deaf people could relate themselves between those attractions and stories. This was congruent with a study by Hongprayoon (2015), who looked at the development of deaf-friendly Internet TV (IPTV) news programming. It was found that deaf people had mainly chosen to expose to information and entertainment by basing on the visual. Therefore, the digital technology developed in this research aims to meet as many deaf people's access patterns as possible. This is consistent with the study of Rodsawang (2018), conducting a study of guidelines for writing scripts for full-screen sign language television programs for the hearing impaired. She pointed out that writing a storyline (Synopsis) should focus on visual communication. A story sequence in full-screen sign language television programs for the hearing impaired must not be complicated or repeatedly back and forth. Writing scripts for shooting (Shooting Script) Screenwriters should put emphasis on visual communication techniques because deaf people perceive mainly through their seeing. There should be no interring with sign language communication.

Additionally, digital technology developed in this study was to facilitate the deaf to access information, including sign language and captions to enable deaf people to access information on tourist places. In addition to recognizing the promotion of access to information for the deaf, it also recognizes that the fundamental rights of the deaf should be equal to that of the general public. It complies with the policy of the National Broadcasting and Telecommunications Commission (2017) in Thailand. It states that the broadcasting or television business for digital television services since 2016 must have basic services that enable people with disabilities to equal access or perceive and gain some knowledge from television programs as the general public does. Its basic measure stipulates that there must be a sign language interpreter and caption following the format of each program so that deaf people can access information. This was consistent with the study of Siriattakul (2012). He describes the current situation of information accessibility of the hearing impaired in a form of technology self-reliance, in which deaf people can rely on access to information through various channels such as television. Most of deaf people choose to consume news or information from a television station with a sign language interpreter running below. or observing the facial expressions of a person. In this regard, this current study recognizes the necessity of the deaf and the requirement; thus, it purposively included all into the development of digital technology. This study prepared the media by providing sign language and captions to encourage deaf people to access information in archaeological sites.

As a result of experimenting with digital technology to promote tourism at archaeological sites for students with hearing impairments, it was found that pre-post digital test scores showed improvement. Post-test scores were higher than before, which showed that the subjects had access to learning and a better understanding of information about archaeological sites. This was not due to their schemata. The technologies developed in this study may contribute to greater learning and understanding of the information at tourism sites from the technologies constructed in this current study, which mainly integrated with the multimedia technology having animations, and captions, and incorporate all of them with the facilities for the hearing impaired, including sign language and captions. As a result, it is a significant part that makes it feasible to transmit the content of tourist attractions videos to deaf people who are viewers efficaciously (Zajadacz, 2014). Besides, Nguyen Manh Huong, et al. (2021) stated that we also could use the teaching method through visual pictures and images: Watching documentary films in schools or cinemas or theaters can be a good way for developing students' thinking ability and attracting more students' attention. In addition, captions are assistive technology for people with hearing impairment since words are displayed on a television, computer, mobile device, or movie screen that describe the audio or sound portion of a program or video. Captions provide information about who is speaking or about sound effects that may be important to understanding a story on television, computer, or movies (Ebrahimi & Bazaee, 2016). At present, deaf people currently have access to the right and the use of public information as well as other information from the broadcasting and television industries.

The finding resonates with Siripanjana (2014), who studied the effectiveness of perception and understanding of the information of deaf people from television programs through sign language interpreters. The results underscore that sign language interpreter is a vital factor for deaf people allowing exposure to information on television programs. Moreover, deaf people watching TV programs with a sign language interpreter had better cognition efficiency than those watching TV programs without a sign language interpreter. Furthermore, not only the tourism resources that might draw tourists' attention but also the accessibility of tourism information, is a component that contributes to the success of tourism (Bowtell, 2015). For that reason, for tourism to thrive, it is critical to include all tourist target groups, including the deaf. It should also provide them with access to the tourism information they require. The sample groups were also satisfied with the developed technology and offered intriguing suggestions for further development, including the need for technology with a voice to promote access to information at tourist attractions for people with disabilities, as some deaf people have had cochlear implants surgery and can hear the sound. As a result, voice dubbing/acting should be used to help people grasp the information better. They also suggested that digital technology akin to that developed in this current study, which is about history, be produced because it will enable hearing-impaired audiences better absorb historical content. The participants appreciated having a sign language interpreter who helped them grasp the video's content, while captions helped them understand the tourist attraction's information. This also makes it easier for people who do not know sign language to read subtitles and understand the stories (Ebrahimi, & Bazaee, 2016).

Conclusion

Tourism improves the quality of life of people with disabilities through the execution of leisure, recreation, and learning activities. Tourism is also able to open their perspectives; it is also a means to heal the mind so that people with disabilities become less worried about their disability. Traveling enhances people with disabilities to achieve a better understanding, which leads to coexistence in society, contributes to self-esteem, and makes people with disabilities adjust to society.

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Digital Technology for Learning Vocabulary for Students with Disabilities

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ABSTRACT

Digital technology for earning vocabulary for students with disabilities. This study aims to 1) study the use of digital technology for learning vocabulary for students with disabilities, and 2) compare scores before and after using digital technology. The sample group was 45 students with disabilities studying in primary 1 by purposive sampling. The "Easy Read Tale" is digital book consisting of 10 stories using 10 single vowels in Thai language, which are made into a computer program for storytelling. The research instruments included 1) pre-and post-tests, and 2) vocabulary learning exercises. The data were analyzed using $\bar{x}$ and S.D. The means of the scores of pre-and post-tests of the samples were tested by t-Test: Paired Two Sample for Means. It was found that the scores before using the Easy Read Tale were low to moderate but the scores after learning were higher. Post-test scores were also highest among blind and deaf students. The students with intellectual disabilities, speech or language disabilities, behavioral or emotional disabilities, autism, and multiple disabilities earned higher scores. The mean scores before and after learning were significantly different at .05. The Easy Read Tale is appropriate for students with disabilities. It designs by using universal design for learning. So, everyone to access digital knowledge. It was the digital technology for equality of students with disabilities in school.

Keywords: Digital technology "Easy Read Tale", Vocabulary learning, Students with disabilities

Introduction

The evolution of technology is changing rapidly. Technology plays an increasingly important role in the daily life of the world's population. Education also has an impact and makes changes according to the trends of technology. During the COVID-19 outbreak, education has been transformed from a traditional form to technology-based education, in addition, some countries choose to use a blended approach employing onsite and online learning (Petretto et al., 2021). Therefore, it is inevitable for teaching and learning management to focus on the development of digital technology that has become an important tool for learners and teachers. In particular, the development of technology to help students with disabilities should receive adequate education during the COVID-19 outbreak (Mohammed Ali, 2021) to provide opportunities for students with disabilities to access education services provided by the state for children equally (Ministry of Education, 2019). Therefore, the development of digital technology should be promoted to promote the development of students with disabilities to have the same access to learning as non-disabled students (Cranmer, 2020), and to find important tools to help teachers or stakeholders and education personnel to use for children with disabilities.

Technology-based teaching and learning are the methods used to encourage students to develop learning and memory skills. The use of diverse and interesting media to attract the attention of students is to focus on what interests them and that can lead to concentration in learning and self-development effectively which is consistent with the theory of behaviorism that focuses on organizing the learning process so that learners receive appropriate reinforcement (Boonthanom, 2010). Multimedia is the use of computers in combination with forms of presentation of information to create a variety of perceptions, whether it is visual, hearing, or the ability to interact with the media. Therefore, the use of multimedia media is widely used as a teaching and learning medium because it is a medium that can motivate and stimulate learning, as well as understand the content well. Media can interact with learner interactions (Songkhram, 2011). In addition, the use of technology to promote education for students with disabilities will lead to the promotion of inclusion and equality in society (Tony, 2019). Therefore, the development of digital technology in learning vocabulary of students with disabilities will be a learning medium for the development of reading and writing, which are important learning skills for students with disabilities to increase their reading abilities. This will be a guideline for educational management to meet special needs appropriately, with media that must be appropriate, convenient, and can promote children's learning effectively and independently. In addition, Al-Obaydi (2022) states that the facility of e-reading help students select the text by themselves and the e-reading is presented in various styles, such as animation, sound and picture. All these styles are related to supporting the reading of the students who have problems with reading that are not students with disabilities that include all students.

Objectives

1. To study digital technology "Easy Read Tale" for learning vocabulary for students with disabilities.
2. To compare scores before and after learning by using digital technology "Easy Read Tale" of students with disabilities.

Conceptual Framework

To achieve the two research objectives stated above, the research model showing the key independent and dependent variables is shown in Figure 1.

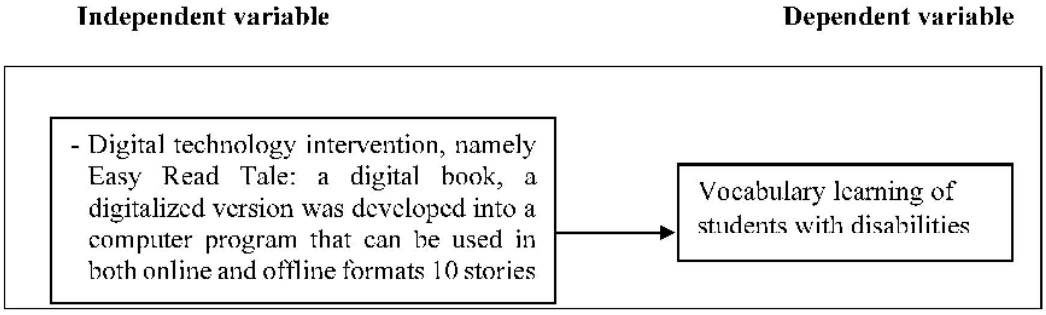


Figure 1: Research Model

Research Methodology

The research methodology is as follows:

1. Population and Sample

The population and sample were comprised of 9 types of students with disabilities studying in primary 1, including students with visual impairment, students with hearing impairment, students with intellectual disabilities, students with physical disabilities, students with speech or language disabilities, students with learning disabilities, students with behavioral or emotional disabilities, autistic students, and students with multiple disabilities. 45 samples were chosen by using purposive sampling of 9 types of disabilities of 5 each.

2. Research Instrument

In this study, the research instrument was the Easy Read Tale: A digital book. It is composed of 10 stories based on Thai language principles which are related to 10 single vowels and 10 single vowel words primary 1. After the 10-story book prototype was created, the Easy Read Tale: A digital book, a digitalized version was developed by using universal design concept and based on the curriculum Thai language in primary 1 after that we have focus group to find the appropriateness of words, sentences and stories which must be in line with the special needs of children with 9 types of disabilities. It has Index of Item – Objective Congruence (IOC) is .80. then we set the "Easy Read Tale" into a computer program that can be used in both online and offline formats. The use of the online format is available on the website: http://edlru.dusit.ac.th/site/digitalbook. Each student with disabilities was assigned to read three stories from the Easy Read Tale: A digital book. The Easy Read Tale: A digital book has Thai single vowel stories, including a, aa, i, ii, u, uu, ue, uee, e, and ee. The titles of the stories include 1) Nana in the Kitchen, 2) Noona's Family, 3) Thida and Friends, 4) Charlie is Happy, 5) The Green Sea Turtle in Talu Island, 6) The Pink Piglet, 7) The Lively Giant Catfish, 8) The Buffalo and the Millipede, 9) Perfect Ne, and 10) Let's Go to the Sea.

3. Data Collection Instrument

The instruments for collecting data are comprised of:

A 50-point pre-test and a 50-point post-test. Assessment criteria for each student (50 points)

Average Score ($\bar{x}$)	Meaning
0.00-1.00	poor
1.10-2.00	quite poor

2.10-3.00	moderate
3.10-4.00	good
4.10-5.00	very good

Score assessment criteria before and after learning of 5 students with disabilities in each type (5 students*50 points which are 250 points/person)

Average Score ($\bar{x}$)	**Meaning**
0.00-5.00	poor
5.10-10.00	quite poor
10.10-15.00	moderate
15.10-20.00	good
20.10-25.00	very good

Vocabulary learning exercise score assessment criteria for each story were 5 words = 5 points *10 stories* read each story 3 times which is 150 words in total.

Average Score ($\bar{x}$)	**Meaning**
0.00-1.00	poor
1.03-2.00	quite poor
2.03-3.00	moderate
3.03-4.00	good
4.03-5.00	very good

Score assessment criteria for students with disabilities: 5 students from each type (5 students*150 points which is 750 points/person)

Average Score ($\bar{x}$)	**Meaning**
0.00-5.00	poor
5.03-10.00	quite poor
10.03-15.00	moderate

15.03-20.00	good
20.03-25.00	very good

This study is quasi-experimental research. It was conducted using the following the steps as follows:

Types of disabilities	Pre-test	Trial of Easy Read Tale: A digital book	Post-test
1. Students with visual impairment	T1	X	T2
2. Students with Hearing impairment			
3. Students with intellectual disabilities			
4. Students with physical disabilities			
5. Students with speech or language disabilities			
6. Students with learning disabilities			
7. Students with behavioral or emotional disabilities			
8. Students with autism			
9. Students with multiple disabilities			

T1 refers to the pre-test.
X refers to an experiment while learning with the Easy Read Tale: A digital book (10 stories* 3 times/story).
T2 refers to post-test.

Hypothesis

H_o: The mean of the population of the two groups is equal ($\mu_1 = \mu_2$).

H_1 : The mean of the population of the two groups is different ($\mu_1 \neq \mu_2$).

Testing the Validity of the Instrument – The validity of the instrument was tested by 5 experts to determine its reliability. It was at a .08 level of confidence.

4. Data Collection

The researchers trained volunteers to collect data by focusing on understanding the use of pre-and post-tests, having students do exercises after experimenting with each story of the Easy Read Tale: A digital book, and making sure that they completed all the exercises in every story. The details of the exercises and tests are shown below.

1. Pre- and post-tests are composed of 50 questions each.

2. Exercise implementation is comprised of the students reading each story from the Easy Read Tale: A digital book, and then doing the exercises. There were exercises on memorization of 5 words per story for a total of 50 words. Students read each story 3 times and recorded scores each time. After that, the scores of the pre- and post-test and the scores obtained from the students' exercises were checked for completeness before analyzing the data.

5. Data Analysis

The data were analyzed with descriptive statistics: $\bar{x}$ and S.D. and means were compared with t-Test: Paired Two Sample for Means.

Results

The study of the use of digital technology to promote learning among 45 students with disabilities was randomly selected among 9 types of students with disabilities, 5 students from each type which is 45 students in total. The results are shown below:

Table 1: Raw scores before, while, and after learning, and the difference in scores before and after learning

Types of disability	Student No.	Before learning (50)	While learning (150)	After learning (50)	Difference (D)
Visual impairment	1	23	149	50	27
	2	23	118	42	19
	3	18	130	45	27
	4	14	133	49	35
	5	18	128	49	31
Total	5	96	658	235	139
Hearing impairment	1	24	149	50	26
	2	23	128	50	27
	3	22	130	45	23
	4	20	133	49	29
	5	21	128	49	28
Total	5	110	668	235	125
Intellectual disabilities	1	12	91	42	30
	2	10	98	36	26
	3	2	76	33	31
	4	2	73	31	29
	5	4	75	33	29
Total	5	30	413	175	145
Physical disabilities	1	18	95	47	29
	2	12	103	43	31
	3	13	101	44	31
	4	11	106	44	33
	5	13	110	44	31
Total	5	67	515	222	155

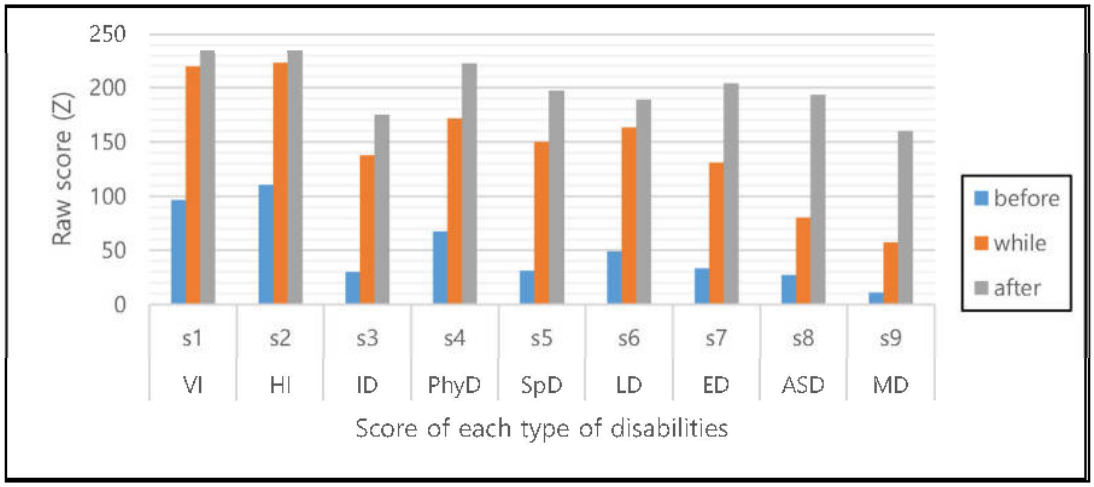
Speech or language disabilities	1	8	91	38	30
	2	6	89	38	32
	3	7	87	38	31
	4	5	88	41	36
	5	5	95	42	37
Total	5	31	450	197	166
Learning disabilities	1	14	125	41	27
	2	6	90	38	32
	3	6	93	35	29
	4	12	88	37	25
	5	11	94	38	27
Total	5	49	490	189	140
Types of disability	**Student No.**	**Before learning (50)**	**While learning (150)**	**After learning (50)**	**Difference (D)**
Behavioral or emotional disabilities	1	12	84	43	31
	2	3	78	40	37
	3	3	78	42	39
	4	6	76	40	34
	5	9	76	39	30
Total	5	33	392	204	171
Autism	1	6	33	36	30
	2	6	56	41	35
	3	5	53	42	37
	4	4	50	41	37
	5	4	49	45	41
Total	5	27	241	193	166
Multiple disabilities	1	5	37	32	27
	2	2	33	31	29
	3	1	37	32	31
	4	1	32	31	30
	5	2	32	34	32
Total	5	11	171	160	149

From Table 1, the scores revealed that before and after learning of students with disabilities were different. The results of using digital technology to learn vocabulary are shown below.

- The scores of students with visual impairment were different. The total pre-test scores of 96 were at a moderate level, and the post-test scores of 235 were at a very good level. There was a difference of 139 points before and after learning.
- The scores of students with hearing impairment were different. The total pre-test scores of 110 were at a moderate level, and the post-test scores of 235 were at a very good level. There was a difference of 125 points before and after learning.
- The scores of students with intellectual disabilities were different. The total pre-test scores of 30 were at a poor level, and the post-test scores of 175 were at a good level. There was a difference of 145 points before and after learning.

- The scores of students with physical disabilities were different. The total pre-test scores of 67 were at a poor level, and the post-test scores of 222 were at a very good level. There was a difference of 155 points before and after learning.
- The scores of students with speech and language disabilities were different. The total pre-test score of 31 was a poor level, and the post-test score of 197 was a good level. There was a difference of 166 points before and after learning.
- The scores of students with learning disabilities were different. The total pre-test score of 49 was a poor level, and the post-test score of 189 points was a good level. There was a difference of 140 points before and after learning.
- The scores of students with behavioral and emotional disabilities were different. The total pre-test score of 33 was a poor level, and the post-test score of 204 was a very good level. There was a difference of 171 points before and after learning.
- The scores of autistic students were different. The total pre-test score of 27 was a poor level, and the post-test score of 193 was a good level. There was a difference of 166 points before and after learning.
- The scores of students with multiple disabilities were different. The total pre-test score of 11 was a poor level, and the post-test score of 160 was a good level. There was a difference of 149 points before and after learning.

The results showed the difference in scores before and after learning with the highest difference of students with behavioral and emotional disabilities (171 points), followed by the students with speech and language disabilities and autistic students (166 points), and the students with hearing impairment (125 points), respectively.



Graph 1: Raw scores of each type of disability

Graph 1 showed that the raw scores of students with disabilities differ from each other. The students with visual, hearing, physical, and behavior or emotional disabilities had average and low pre-test scores but the scores while and after learning were higher. The scores were 235, 222, and 204, respectively, which were all at a very good level. The students with intellectual, speech or language, learning, behavioral or emotional, autism, and multiple disabilities had scores of 30, 31, 49, 33, 27, and 11, respectively, which were all at a low level. However, after learning, it was found that the scores were higher which were 175, 197, 189, 193, and 160, respectively.

Table 2: Raw scores, mean, standard deviation, and interpretation of scores before, while, and after learning

Type of disability	Before learning (250)				While using Easy Read Tale: A digital book (750)				After learning (250)			
	(Z)	($\bar{x}$)	(S.D.)	Interpretation	((Z)	($\bar{x}$)	(S.D.)	Interpretation	((Z)	($\bar{x}$)	(S.D.)	Interpretation
Visual impairment	96	9.60	1.51	quite poor	658	21.93	2.89	very good	235	23.5	1.18	very good
Hearing impairment	110	11	1.05	moderate	668	22.27	2.90	very good	235	23.5	1.18	very good
Intellectual disabilities	30	3.00	2.58	poor	413	13.77	4.07	moderate	175	17.50	1.65	good
Physical disabilities	67	6.70	1.06	Quite poor	515	17.17	5.33	good	222	22.20	1.69	very good
Speech or language disabilities	31	3.10	2.47	poor	450	15.00	5.78	moderate	197	19.70	2.95	good
Type of disability	**Before learning (250)**				**While using Easy Read Tale: A digital book (750)**				**After learning (250)**			
	(Z)	($\bar{x}$)	(S.D.)	Interpretation	((Z)	($\bar{x}$)	(S.D.)	Interpretation	((Z)	($\bar{x}$)	(S.D.)	Interpretation
Learning disabilities	49	4.90	1.91	poor	490	16.33	5.52	good	189	18.90	1.97	good
Behavioral or emotional disabilities	33	3.30	2.45	poor	392	13.07	6.05	moderate	204	20.40	0.84	very good
Autism	27	2.70	2.54	poor	241	8.03	5.68	quite poor	193	19.30	2.16	good
Multiple disabilities	11	1.10	1.60	poor	171	6.03	5.33	quite poor	160	16.00	1.491	good

Table 2 shows that each type of disability had a different average score. Most of the pre-test average scores were relatively low and low, including students with visual impairment, intellectual disabilities, physical disabilities, speech or language disabilities, learning disabilities, behavioral or emotional disabilities, autism, and multiple disabilities ($\bar{x}$=9.60, 3.00, 6.70, 3.10, 4.90, 3.30, 2.70, and 1.10, respectively), except for students with hearing impairment who had moderate score ($\bar{x}$=11). A high post-test mean refers to a very good level which includes students with visual impairment, hearing impairment, physical disabilities, and behavioral or emotional disabilities ($\bar{x}$=23.5, 23.5, 22.20, and 20.40, respectively). The results at a good level included students with intellectual disabilities, speech or language disabilities, learning disabilities, autism, and multiple disabilities ($\bar{x}$=17.50, 19.70, 18.90, 19.30, and 16.00, respectively).

Table 3: t-test values of each type of disabilities

t-Test: Paired Two Samples for Means	
Mean	201.111111	50.444444
Variance	667.861111	1138.0278

Observations	9	9
Pearson Correlation	0.90337767	
Hypothesized Mean Difference	0	
Df	8	
t Stat	29.7555224	
P(T<=t) one-tail	8.822E-10	
t Critical one-tail	1.85954804	
P(T<=t) two-tail	1.9645E-09	
t Critical two-tail	2.30600414	

From Table 3, the hypothesis testing results with the mean t-test showed that the calculated t-value was 29.75 which is greater than the t value (two-tail) of 1.96. It can be concluded that the pre-and post-test scores of the sample of each type of disability are different. The scores of at least one group are statistically different at a .05.

Table 4: Values of t-Test: Paired Two Sample for Means of all students with disabilities

t-Test: Paired Two Samples for Means		
Mean	40.67	10.04
Variance	32.05	49.13
Observations	45.00	45.00
Pearson Correlation	0.79	
Hypothesized Mean Difference	0.00	
Df	44.00	
t Stat	48.10	
P(T<=t) one-tail	0.00	
t Critical one-tail	1.68	
P(T<=t) two-tail	0.00	
t Critical two-tail	2.02	

*** Statistical significance at .05

From Table 4, the results of the hypothesis test with mean t-test showed that the calculated t value of 48.10 was greater than the t value (two-tail) of 2.02. It can be concluded that the pre- and post-test scores of each student were different. The scores of at least one student were statistically different at .05.

Discussion

The research results found that digital technology can be used to learn Thai vocabulary for students with disabilities in primary 1. The digital technology developed in the form of stories and for each story that students with disabilities, based on the findings of the results, showed that it will help them learn vocabulary and understand the meaning of various terms. This result is similar to those found in the research undertaken by Svensson et al. (2021), who study also focused on the Effects of assistive technology on students with reading and writing disabilities. Moreover, the reading ability of students can improve when use technology. This is because the design of the Easy Read Tale has been developed from the needs of students with special needs and education specialists for children with disabilities. The students recommended on the Easy Read Tele, such as visually impaired children required voices to be read and read various sentences, and students with hearing impairment need sign language. In addition, students with learning disabilities want the book to be clear and highlighted in the vocabulary.

Furthermore, using the digital technology developed in the form of stories and created by using multimedia will make it easy for students with disabilities to access knowledge. It can help to promote the development of students' reading of the Thai language effectively. Besides, Al-Obaydi (2022) states that e-reading can change the views of students about reading as easy-to-access e-reading and technology create interesting interactive content for the learning of the students. Moreover, this is consistent with the research of Hong-ngam & Polrachom (2021) that developed a kit to promote the development of children with reading disabilities in the early stages by developing digital technology TERA (TERA) to promote online reading. It was an experiment with 10 students with reading disabilities and the conclusions found that the students had higher scores after learning. This is also consistent with the research of Prachumwan & Thirakot (2014) that studied the development of computer games to promote reading for children with disabilities. It was found that promoting reading for children with disabilities using mixed media computer-generated games can enhance children's reading. Moreover, Saad et al. (2015) stated that multimedia presentations can help students with disabilities to be more active in learning and improve their cognitive skills. In this study, the samples were satisfied with the illustrations in the media provided because of the colorful illustrations that made it fun and enjoyable, and not boring which is unlike learning from a book. This is in line with the study of Srisanit (2015), which found that multimedia is a good option for turning abstracts into concrete and motivating media for students to learn according to their ability. Therefore, it is a tool for transferring learning between teachers and students for maximum efficiency and to raise the level of education for learners to achieve higher educational achievements.

The Easy Read Tale: a digital book is one tool to help students with disabilities to facilitate learning by using technology due to a shortage of special education teachers. Today, there are assistive technology tools available to help students with disabilities learn more effectively. They range from "low" complexity, such as simple graphics-enabled worksheets, to "high" technologies that are growing and being widely adopted. It is a technology that facilitates many aspects (Hebbeler & Spiker, 2016). The Easy Read Tale: A digital book can help teachers or others who want to learn in the classroom and make a difference in learning for students of all skill levels. Additionally, this digital book developed by researchers is highly effective and useful for students with disabilities, teachers, and parents. This finding is congruent with the research carried out by Storer & Branham (2019), who indicates that using reading books and technology for reading of parents with their children has an effective activity for developing skills of their children, for example, literacy skills. Moreover, the Easy Read Tale can be used by children without disabilities as well as to promote the learning of students with disabilities both inside and outside the classroom as a resource for practicing Thai language skills and as a tool that helps children learn continuously. It is a teaching medium that is up to date with current events in the Covid-

19 crisis (Petretto et al., 2021). Since most students currently study online, it allows students to review lessons. As a result, students with disabilities can develop self-esteem and self-confidence to learn by reading independently. This is supported by a study by Lynch, Singal & Francis (2022). which found that technology can support children in the ways of learning, building self-esteem and to flourish at school.

Recommendations for Applying the Research Results

Based on the research findings, some of the key recommendations are

1. Digital reading technology should be applied to students with disabilities to promote the learning of Thai vocabulary and skills of children with disabilities. For example, blind children can be used by listening to the entire story. Deaf children can turn on their own by selecting the sign language menu. children with learning disabilities and children with intellectual disabilities or other defects can choose to read in words or read in sentences as well.
2. The data from the exercises should be used to analyze helping students with disabilities of each type effectively. As this study design the Easy Read Tale based on a universal design concept, therefore, everyone can access the Easy Read Tale in a convenient, easy, and equitable manner.
3. Training teachers involved in teaching to use the Easy Read Tale: A digital book should be a priority.

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