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Editorial

From the submissions to the final acceptance and publication of papers for each issue, all papers undergo the Preliminary Review continuously screened out 60% of all documents submitted, resulting in 10 articles going forward to the Double-Blind Reviews for this September/October 2022 Issue. In the issue, we continue our tradition of celebrating the SEAAIR 22nd Annual Conference Best Part Award and two Outstanding papers, to be enhanced before acceptance in JIRSEA. For the regular papers, the first paper from Vietnam introduces a new model for university transformation in the context of the Fourth Industrial Revolution (4IR) through performance metrics used to evaluate 10 universities in Vietnam. Two papers from Taiwan looked at Strategic Alliances in Institutions of Higher Education to promote Sustainable Development Goals and Exploring the Inner Characteristics and External Competency of Excellent Teachers, respectively, with both using case studies of Taiwanese universities. The fourth paper is focused on Powering HEI Survey System for Data Analytics to move the conventional independently constructed surveys into a PASS (Performance Analytics Surveys System). The fifth paper from Malaysian scholars looked at the Sense of Coherence and Academic Procrastination with Coping Strategies as Mediators of undergraduate students. Our researchers from the Philippines authored the sixth paper looking at Online Learners' Continuance Intention and proposed a Theoretical Model for the students' continuing intentions for online learning. The seventh paper from the sub-continent country of Pakistan looked at Experiences of in-service Ph.D. Scholars for undertaking Jobs and Study concurrently through the case study of a Pakistani higher education institution. We have three papers from Thailand's leading public universities for this issue. These three papers cover more of the humanities teaching and learning. These papers looked at (a) Trends of Corpus Linguistics Used in English for Specific Purposes Research through the use of a Case study of the Asian ESP Journal; (b) The outcome of using the Line app for the English-speaking practice of Thai EFL students; with the final paper looking at (c) Collaborative CLIL Teaching Between ESP Teacher and Public Relation Professionals in English for PR Course.

The key synopses of these six papers are as follows:

- **Article 1 – Nguyen Huu Thanh Chung & Tran Van Hai,** *both from VNU University of Social Sciences and Humanities*, **Luu Quoc Dat** *from VNU University of Economics*, **Nancy W Gleason** *from NYU Abu Dhabi* and **Nguyen Huu Duc** *from Vietnam National University & UPM Institute* introduced a new model for university transformation in the context of the Fourth Industrial Revolution (4IR). The new approach, known as the Innovation-driven University, applies criteria and indicators through the University Performance Metrics (UPM). The UPM has three key characteristics: radical mindset changes, holistic innovation facilitations, and ecological and social norm encouragement. The innovation-driven method redefines universities as ecosystems that innovate for others rather than in isolation and

facilitates the demands of entrepreneurial spirit, innovative approaches, digital transformation needs, personalized education, and ecological and social norm promotion.

- **Article 2 – Ying-Yan Lu and Chien-Hung Lee**, *both from Kaohsiung Medical University*, **Ching-Hui Lin and Bo-Hsien Hu** *both from National Sun Yat-sen University*, and **Szu-Yin Lin** from *Kaohsiung University of Science and Technology, Taiwan,* explored the effects of forming a strategic alliance between two universities in Taiwan on facilitating the academic publication of SDG-related topics and determining the benefits of strategic alliances between the two case universities after their strategic alliance in 2012. Results showed that scholars from the two universities focused more on SDGs 2, 5, 7, and 13 than the other goals.
- **Article 3 – Tao-Ming Cheng, Long-Sheng Chen,** and **Shiao-Pei Yu,** *all from the Chaoyang University of Technology,* **Hsing-Yu Hou** *of National Taichung University of Science and Technology, Taichung, Taiwan, ROC* explored the inner characteristics and external competence, and that predicts a promotion model of excellent teaching. General statistics, correlation analysis, chi-squared test, and C5 decision tree models were carried out in this research. The results showed that the highest frequency of teaching beliefs belonged to enablers, implying that high sensitivity and inclusion are the principal teaching beliefs. Most excellent teachers have also focused on environment-centered teaching values. Creativity and IT were significantly positively correlated, but IT competency was negatively correlated with teaching experience. Furthermore, the field, teaching values, and teaching experience significantly influenced the promotion type of excellent teachers.
- **Article 4 – Mubarak AlKhatnai** *of King Saud University, Riyadh, Saudi Arabia,* and **Teay Shawyun** *of South East Asia Association for Institutional Research* proposes a PASS (Performance Analytics Surveys System) that holistically combine common themes of accreditation surveys & KPIs requirements into the 6 sets of conventional surveys underpinning IQA & accreditation requirements. These are then transformed into robust KPIs that are processed & cascaded from institutional-collegial-programmatic-individual levels to determine & support performance management at all levels in the HEI.
- **Article 5 – Poh Chua SIAH, Leela Murugan, Ling Qian LOO, Man Ting TAN, and Swee Mee TAN,** *all from Universiti Tunku Abdul Rahman, Kampar Campus, Malaysia,* used the personality-coping-outcome theory as a framework, hypothesized that coping strategy is the mediator for the effects of a Sense of Coherence (SOC) on academic procrastination. The results showed that a Sense of Coherence has a direct impact and is partially mediated by a problem-focused coping strategy for academic procrastination. It supports applying the personality-coping-outcome theory as a framework to understand the mechanism associated with a sense of Coherence and academic procrastination among undergraduates.
- **Article 6 – Ma. Florecilla C. Cinches** and **Dominic T. Polancos,** *both from Liceo de Cagayan University, Philippines***, Judith C. Chavez** *of Lourdes College***, Ruth Love V. Russell** *of Xavier University-Ateneo de Cagayan***,** *Philippines,* attempted to understand online learners' continuance intention in an online learning environment through a theoretical model considering student-student interaction, student-instructor interaction, student-content interaction, course satisfaction, service quality, perceived value, and internet self-efficacy predictors. The study revealed that continuance intention is influenced by perceived value and service quality.

- **Article 7 – Muhammad Aslam** and **Aziz Ahmad,** *both from the Institute of Education and Research, University of Punjab*, and **Nisar Abid** *from the University of Management and Technology, Lahore, Pakistan,* explored the experiences of in-service Ph.D. scholars for combining job and study simultaneously who were enrolled at the Institute of Education and Research, University of the Punjab, Lahore. The study revealed that the in-service Ph.D. scholars had no time for participation in their social life activities. They also faced health-related problems. The continuation of research and job simultaneously was the source of considerable stress and anxiety for Ph.D. scholars and significantly affected their academic learning and job performance.
- **Article 8 – Jenjira Jitpaiboon and Atichat Rungswang**, *both from the Faculty of Liberal Arts, King Mongkut's Institute of Technology Ladkrabang,* investigated the trends of corpus linguistics used as a methodology in the English for Specific Purposes (ESP) research based on corpora of research article (RA) abstracts and conclusions published in the Asian ESP journal between 2005 and 2020. This study demonstrated how corpus linguistics could be applied as a research tool in trends investigation and contributes to the area of both corpus linguistics and ESP research.
- **Article 9 – Thanawan Suthiwartnarueput** and **Thanawat Nutayangkul,** *both from the Faculty of Liberal Arts, Mahidol University* study aimed (1) to examine the effects of using LINE App for English speaking practice on the students' English speaking proficiency and (2) to study the critical role of contributory factors triggered by the use of LINE App, such as motivation, levels of anxiety, self-confidence, and convenience in improving the students' speaking proficiency. The comparison between the pre-test and the post-test reveals a marked improvement in the student's English speaking proficiency after four weeks of speaking practice via the LINE App. It found the students to be highly motivated, confident, and less anxious while speaking English after receiving the English-speaking treatment via the LINE App.
- **Article 10 – Jenjira Jitpaiboon** and **Passapong Sripicharn** *from the faculty of Liberal Arts, Thammasat University,* highlighted a CLIL collaboration between an ESP teacher and the domain experts outside the educational setting in an English for PR course at a public university in Thailand. The findings revealed the beneficial effects of the collaboration, such as increased authenticity in the ESP classroom and improved students' academic achievement and motivation. This research significantly contributes to pedagogical PR research and bridges a gap between theory and practice.
- **Article 11 – 22nd SEAAIR Conference "Outstanding Paper" Citation by Jet G. Guerrero, Christine Grace Mapa-Azul, and Jason O. Carmona,** *all hailing from the University of Santo Tomas Legazpi Philippines,* assessed and evaluated the research culture at the University of Santo Tomas-Legazpi, a Dominican university along a) research administration, b) research policies, c) research incentives, d) research publications, e) research awards and recognitions, and f) research linkages utilizing a mixed methodology and employing a survey questionnaire. It found that all these areas are pivotal in advancing research frontiers and cultivating a culture that research is essential in HEIs.

- **Article 12 – 22nd SEAAIR Conference "Best Paper" Award by *Albert A. Villanca*** *from Bukidnon State University, Malaybalay City, Bukidnon, Philippines,* developed a causal model that served as the best fit model for the performance of three hundred fifty-three (353) faculty in state universities and colleges in Northern Mindanao, Philippines, during 2017-2018. Results revealed that the organizational culture of faculty in higher education institutions in terms of involvement, consistency, adaptability, and mission traits was generally high. The faculty strongly agree regarding their psychological attributes. They are neutral about their present school environment. Also, the performance of the faculty is very satisfactory. It also found that the work attitude of the faculty is significantly correlated with performance. The result further revealed that faculty work attitude is the best predictor of performance. Finally, a performance culture consistency motivation (PCCM) model was developed anchored on the consistency of organizational culture and personal motivation of faculty as supported by adaptability, work attitude, affiliation, student support, and participatory decision-making.
- **Article 13 – 22nd SEAAIR Conference "Outstanding Paper" Citation by Imeldha Putrianti** *of Sekolah Dharma Suci Jakarta* and **Ktut Silvanita Mangani** *Universitas Kristen Indonesia* used a qualitative method design of a case study to present as much information as possible about the Risk Management of Implementation Learning from Home during the COVID-19 Pandemic at SMA 'X' in North Jakarta. The results of the study explain the identified causing factors of the decline in the quality of education, namely teachers' readiness and skills, unchanged learning method, and the difficulties in measuring student competency.

JIRSEA Editor: Assoc. Prof. Teay Shawyun, Ph.D.

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Measuring 4IR Responsiveness in Vietnam's Higher Education

Nguyen Huu Thanh Chung[1*], Tran Van Hai[1], Luu Quoc Dat[2], Nancy W Gleason[3] and Nguyen Huu Duc[4,5]

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ABSTRACT

This research introduces a new model for university transformation in the context of the Fourth Industrial Revolution (4IR). This new approach, known as the Innovation-driven University, applies criteria and indicators through the University Performance Metrics (UPM). The UPM has three key characteristics: radical mindset changes, holistic innovation facilitations, and ecological and social norm encouragement. Instead of past transformations' entrepreneurial approach, the innovation-driven method redefines universities as ecosystems that innovate for others rather than in isolation. An innovation-driven model facilitates the demands of entrepreneurial spirit, innovative approaches, digital transformation needs, personalized education, and ecological and social norm promotion. It is a new framework to measure innovation in higher education institutions (HEIs) that integrates criteria that respond to the demands of the 4IR. This article assesses UPM's ability to evaluate the 4IR readiness of 10 HEIs in Vietnam. We provide conclusions on the skills HEIs need to develop to prepare graduates for work and life in the 4IR.

Keywords: 4IR, Innovation-driven University, Ecological University, Digital Transformation, University Rating.

Introduction

The world is changing quickly, and old benchmarking models do not sufficiently account for disruptions associated with the fourth industrial revolution (4IR). Quality, access, and sustainability are key characteristics of reputable higher education institutions (HEIs). These qualities are essential for individual learning and human capital formation. As such, academic standards are established in line with relevant geographical accreditation bodies to communicate the viability of awarded credits and degrees. The university is responsible for the academic quality and standards of all degrees in its name. At the same time, the university must ensure that its academic standards are at least as high as those of comparable institutions. Then, when necessary, they can innovate to meet expectations within their constraints. Benchmarking across universities within a country and across international borders allows HEIs to identify and monitor changing standards and performance to maintain quality and improve outcomes, processes, and policies. Based on this benchmarking, the reputation and funding for a given HEI are closely linked to its reputation for quality. In this context, quality evaluation benchmarks, rankings, and ratings play a central role in shaping global higher education standards. These processes verify a given HEI's standing to all relevant stakeholders and enable them to plan and achieve change more efficiently (Stoller, 1995).

This research focuses on how HEIs assess their ability to produce 4IR-ready graduates and innovate. Innovation is understood as relating to processes for developing, adopting, and delivering policies and practices that generate change, efficient practices, new programs, and technology deployment with organizations and their community members. (Comeaux, 2013). Quality higher education is now associated with employability in a disrupted world, and HEIs curriculum, pedagogy, and research respond to these challenges. Countries and universities have an obligation to their students and funders to consider their 4IR readiness (Gleason, 2018; Wissema, 2009; Barnett, 2018; Chung et al., 2020; Chung et al., 2022; Dewar, 2021; OECD, 2017). To become more effective and relevant institutions in this disrupted 4IR era, universities need a benchmarking tool that fully reflects the characteristics and requirements of the graduate, the labor market, and society. New benchmarking metrics and indicators can provide universities with directions for improvement and act as critical drivers of change to address antiquated policies that do not support evolving students or research. The criteria we use to assess quality must change as the world changes.

To address this problem in Vietnam, colleagues at Vietnam National University developed the University Performance Metrics (UPM) (UPM, 2020). UPM is a sophisticated new benchmarking framework that assesses HEI responsiveness to 4IR educational demands. UPM is a score rating system of HEI's quality based on benchmarking references.

The main objective of this rating system is to promote benchmarking among universities against five newly-relevant and innovative 4IR-relevant education characteristics: Entrepreneurial Spirit, Innovative Approaches, Digital Transformation, Personalized Education, and Ecological and Social Norms. Fifty-five universities from the ASEAN region (including Brunei Darussalam, Myanmar, Indonesia, Philippines, Thailand, and Vietnam) and Taiwan have implemented UPM. The

participants expressed their satisfaction with the ratings they received and praised UPM for building a system that could help fulfill their vision of becoming a competitive university at the international level. These participants expressed appreciation for creating a benchmark their students and potential employers could use as indicators of success relative to their local contexts and disrupted world.

This research provides insight into the skills HEIs need to develop in graduates to prepare them for work and life in the 4IR. In this article, we redefine the characteristics of successful HEIs following the UPM approach of innovation-driven universities and use UPM's core indicators to evaluate the 4IR readiness of technological HEIs of Vietnam.

The Evolution of Higher Education

Three Generations of HEIs

In the context of world changes, Wissema provides a detailed description of three different generations of HEIs (2009) and their evolution in recent times. He argues that they are experiencing significant change again and evolving from more traditional research-based and government-funded universities into international know-how hubs, which he calls third-generation universities, or 3GUs. Wissema's framework helps us understand how benchmarking today's institutions also needs to change. In current benchmarking systems, innovation and entrepreneurship are not correctly weighted for their significance if incorporated.

Borrowing Wissema's terminology, we can assess the first-generation universities (so-called 1GUs) as metaphysical places of learning in service to god. Among 1GUs, the university was brick-and-mortar churches, mosques, monasteries, and temples, and teaching was mostly one-way presentations where learners, typically exclusively male, were passive recipients of knowledge. These universities worked to reinforce universal truths and train future leaders of their society in service to god. But these first-generation schools eventually produced what is known today as a liberal arts education. Grounded in the pedagogies of Confusious, Al Ghazali, Plato, Ibn Khaldoon, and modern-day philosophers such as John Dewey in the United States, these schools combined interdisciplinary curriculum and rote memorization, and dialogical learning to inform the modern Liberal Arts model.

The second-generation universities (2GUs), according to Wissema, are the research-oriented universities that emerged in post-industrial societies (such as the Humboldt University of Berlin, founded in 1810). These universities reduced the universal truths to experimental and logical verification of specific theories and hypotheses with a monodisciplinary approach. In these HEIs, specialization was narrow, deep, and siloed in interdisciplinarity. Although there was engaged interaction between faculty and students, the primary function of a 2GU was the transmission of knowledge and foundational research. Second-generation universities also embed the computer in their operational processes and, eventually, the personal computer. Research in 2GUs has been an

essential source of innovation and economic growth. However, there has been little effort to support the application of research for the betterment of society in 2GUs. The development of 2GUs emerged from the idea that universities would generate basic knowledge while companies and institutes would develop applied know-how that could translate into practical and economic solutions (Wissema, 2009). As the importance of innovation and disruptive technologies has become clear with 4IR technologies, governments are less content with funding research for its own sake. Over the last 25-30 years, governments shifted the purpose of funding HEIs. They have become incubators of new science- or technology-based commercial activities for existing firms or startups (Chung et al., 2022).

A shift toward third-generation universities (3GUs) is characterized by governments encouraging HEIs to take an active role in exploiting their knowledge. They are funding research to support activities in the interest of the economy. Thus, universities have become explicit instruments of economic growth in the knowledge economy, and 3GUs have emerged with new economic goals that first-generation institutions did not prioritize. The 3GU might be best described as the entrepreneurial university, which actively supports the creation of value to society by supporting the development of talent, but also techno-starters, and startups. Exploiting know-how is the 3GU objective, as universities are seen as the cradle of new entrepreneurial activity in addition to traditional research and education tasks. In this case, education is pursued to create scientists, scientifically educated professionals, and entrepreneurs.

Redefining the Modern University

While HEIs have been evolving, so too have local societies and the global economy. The 4IR has been altering how we live, work, and relate to one another. The rapid change we see with digital technologies renders obsolete traditional approaches to HEIs. Information is no longer solely controlled by universities; the skills most needed to relate to using information, not where to get it. These changes require a new model for HEIs to make education worthwhile for the individual, the community, and the economy.

The Malaysian Ministry of Higher Education (MOHE, 2018) has identified nine ways that the 4IR has created uncertainty for higher education; these can be reduced into four main areas. First, HEIs are challenged by changing labor market trends due to automation in specific industries. We are already seeing automation of tasks, shifts in part-time employment through the gig economy, and increased demand for lifelong learning and active learning skills. Second, there is an extraordinary demand for digital literacy as technologies change and new software platforms emerge faster than humans can master, requiring new cognitive load management expertise and learning skills (MOHE, 2018). Third, there is a changing landscape for entrepreneurs who need to know how to leverage global platforms to facilitate startups for economic growth and new livelihoods. Finally, human lifestyles and value systems are changing systemically, which has implications for how we personalize education at scale and what humanistic characteristics people choose to foster – such as emotional intelligence and civic engagement (MOHE, 2018).

Drawing on literature from the 4IR and ministries of education across Southeast Asia, we identified three key areas that HEIs can focus on to foster skills and competencies in graduates and against which they can benchmark themselves: (i) radical mindset changes, (ii) holistic innovation facilitations, and (iii) ecological and social norm encouragement. These new capacities could help universities respond to the trends in 3GU and 4IR and position themselves for success. While funding, security, and access issues complicate innovations in curriculum, staff, and infrastructure, 3GUs should be encouraged to reorient their pedagogical approaches based on these three key areas.

Radical Mindset Changes: As Fang, Kand, and Liu note in *Measuring Mindset Change in the Systemic Transformation of Education*, "mindsets as the basic assumption, beliefs, core values, goals and expectations shared by a group of people who are committed to a specific field, and what they will use as rules to guide their attitudes and practice in the field." (Fang et al., 2004, p. 299), Hagen (2002) has highlighted the importance of mindset shifts in order to foster entrepreneurial innovations in HEIs. Currently, many HEIs operate with the initial industrial revolution mindset, whereby humans need to be developed to support the production of goods. Disruptive innovations, and catastrophes are forcing change. Covid-19, which forced emergency remote instruction around the world in April 2020, highlighted that old ways of functioning are outmoded. HEIs are notorious for being resistant to change. However, entrepreneurialism and innovation are mindsets, and mindset changes are essential to developing future-ready graduates and future-relevant research for innovative HEIs.

Holistic Innovation: Innovation is not just the successful introduction of something new based on an invention (or research), but rather, the ability to innovate, recognize and create opportunities, work in teams, take risks, and respond to challenges (Kirby et al., 2011). The innovation we refer to here involves substantial shifts in organizational character to foster more efficient, productive systems and well-educated employable graduates (Smith & Burton, 1998). We refer to "holistic innovation" to include leadership and governance, organizational innovation ecosystems; people and their incentives; innovative teaching and learning; and innovation-driven research (and/or exploitation of knowledge) (Smith & Burton, 1998).

Embracing digital technology to run systems, deliver teaching, and conduct research is part of HEI's holistic innovations. Some have referred to such HEIs as smart universities. South Korea has developed some of the most well-known national initiatives in smart education (Lim & Kye, 2019). Recently, a conceptual model of smart universities proposed digital transformation-oriented higher educational institutions using digital infrastructure (digital legal, digital human resources, digital data, digital technologies, and digital applications) to provide personalized learning services to learners of all generations in the country and around the world.

For the evaluation of the impact of digital transformation and attempts at holistic innovation in HEIs, the UPM establishes eight indicators. These include information analysis and management, digital scholarly resources, learning resource access, interactive learning, MOOC and digital

lessons, blended learning, application of cyber-physical systems, and information ethics. These are introduced in detail in Table 1 below.

Ecological and Social Norm Promotion: As we are now in the Anthropocene, human activity is environmental. The 21st-century university is embedded and interconnected with multiple aspects of the social, cultural, and material worlds. Universities are well positioned to champion the 17 Sustainable Development Goals (SDGs). Not just through supporting SDG #4 - increased access to quality education, but also by explicitly supporting SDG #17, which relates to global cooperation on all the other goals. HEIs need to be innovative leaders in addressing the world's disruptive challenges. The role of an HEI is to apply an ecological lens to lead, strengthen, and enhance the sustainability of our species. Through the curriculum, actions, funding, and internal practices, HEIs can support the achievement of the SDGs by 2030. Innovative HEIs work to foster knowledge and expertise that help address the grand ecological challenges of our earth. And they can produce graduates that can navigate modern complexities by training teachers and students in relevant interdisciplinary areas.

This work is not just about ecological systems but also sustainable societies that are allowed to be civically engaged. Chankseliani and McCowan (2021) have highlighted that not all universities can address the SDGs due to a lack of funding or other local challenges. However, the SDGs cover many aspects of the human and ecological connection. SDG #16 relates to promoting peaceful, inclusive societies, providing access to justice for all, and building accountable and inclusive institutions. Preparing critical thinkers, problem-solvers, and compassionate citizens will support the structures of peace within society. In a fragile world where civil and international conflict is being waged on several continents, the sustainability of society is intrinsically linked to fostering social norms that value peace over conflict.

Characteristics of The Innovation University: A Model for Assessment

Building on the ideas Wissema (2009) shared, this research establishes the model and the way to become an innovation-driven university. For this case, university classifications and the convergence of teaching intensive- and research-oriented-universities to an innovation-driven university model are presented in Figure 1. Here, Types 1, 2, and 3 are 1GU, 2GU, and 3GU, while Types 4 and 5 are excellent versions of 2GU and 3GU. If a Type 1 university wants to develop itself, it first has to create a thorough research base to become a Type 2. As discussed below, Type 1 universities can reach a Type 3 one thanks to non-R&D based innovation (or open innovation). Type 2 universities, however, can facilitate their R&D-based innovation (or pioneer innovation) and collaborate actively with the industry to become Type 3 universities or innovation-driven universities, which include three key characteristics: radical mindset shift, pursuing holistic innovation, and promoting social and ecological norms.

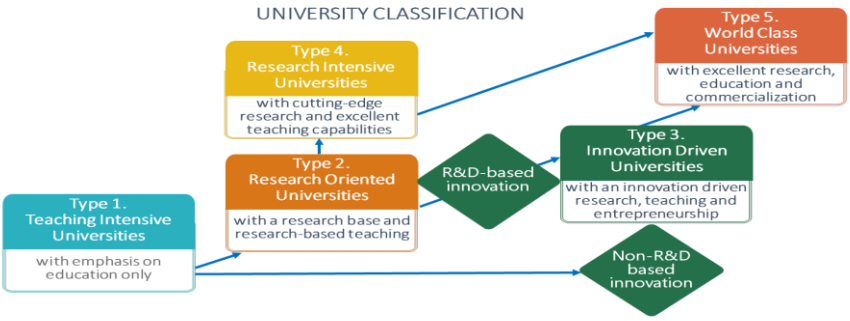

Figure 1: University Classifications and The Convergence of Teaching Intensive and Research Oriented-Universities to An Innovation-Driven University Model.
Source: Developed by Wissema (2009) And Chung et al. (2022).

The model consists of two core clusters, traditional education, and research-based cluster, and a general innovation cluster. There are two optional elements, specific innovation corresponding to the teaching-intensive and research-oriented universities, as depicted in Figure 2. The traditional education and research-based group consist of traditional university components that perform the basic research and education functions, such as faculties, departments, and teaching and learning processes. It is not presented in detail here; below, we focus only on the components and characteristics of the general and specific innovation models applied through the UPM.

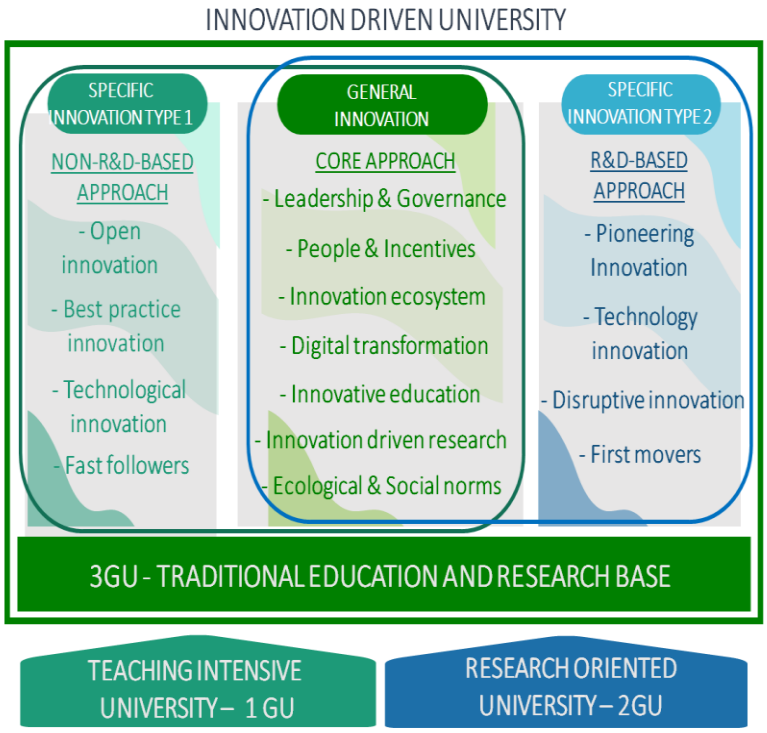

Figure 2. Model of Innovation-Driven University,
Source: Developed by Chung et al. (2022).

General Innovation

The mechanism of innovation development in the university lies in creating the An innovative environment, including all the business development processes of its constituents (research, professionals, infrastructure, and funding), provided well-designed goals are set based on the defined principles (Krasovskiy et al., 2020). The general innovation cluster of a highly-adaptive innovation-driven university includes the following seven components: (1) Leadership and governance, (2) People and incentives, (3) innovation ecosystems, (4) digital transformation, (5) innovative teaching and learning, (6) innovation-driven research, and (7) ecologically focused social norms. These components are discussed in turn below.

Leadership and Governance: Entrepreneurship, innovation, digital transformation, personalized education, and new social norms are the significant elements of this new university strategy. There is a high-level commitment to implementing university innovation strategies and strengthening university culture. In an innovation-driven university, the HEI has an organizational model for coordinating and integrating entrepreneurial activities at all levels (Gibb, 2012; Etzkowitz, 2017). The university has defined its reputational ambitions, articulated in the strategic or corporate plan. The university's corporate plans and core statements specify and make references (through KPIs and goals) to a desired future reputation for the university. A university identity guide is a quality assurance mechanism for visualizing the brand and reputational attributes. All academic and service departments have identified how they can positively contribute to enhancing the university's reputation. Documents, policies, and resource allocation to carry out missions and achieve goals are established and implemented, primarily resource investment for achieving the goals of an innovation-driven university.

People and Incentives: The university invests in the talent development of academic staff and first-year undergraduate students to support its innovation agenda. It raises awareness of the importance of developing innovation abilities among staff and students (Gibb, 20012; the US, 2013). The university actively encourages individuals to become entrepreneurial, provides opportunities to experience entrepreneurship, and supports individuals and groups to move from entrepreneurial ideas to action. Besides creating new mechanisms for breaking down traditional boundaries and fostering new relationships to bring internal stakeholders (staff and students), the university gives status and recognition to collaborators who contribute to the university's innovation agenda.

Innovation Ecosystem: Besides the traditional education and basic research focus, the university innovation ecosystem includes interdisciplinary, project-oriented research centers, which work on transferring knowledge and technology to the business community. In addition, there are creative co-working spaces and startup support systems for faculty, staff, students, and the broader startup community to share ideas, design, construct, and develop new products (Gibb, 2012). A business incubator and/or center for entrepreneurship is a unit that supports individuals and groups

moving from entrepreneurial ideas to action. A center for developing university intellectual property is indispensable for the economic focus.

Although there is no neat patterning concerning the ecological focus of a given HEI, a green and modern campus environment would help the innovation-driven university to be powered ecologically. Indeed, it proposes the atmosphere and ethos of the universities. Critically, the university has strong links with incubators, science parks, and other external initiatives, creating opportunities for dynamic knowledge exchange. The presence of business and industry partners at the university events on campus is a measure.

Digital Transformation: Digital transformation is about more than adopting a learning management system and new student information platforms. It is about expediting time and increasing completion rates of students while bringing in technological changes to lower costs, monitor quality assurance, and enable quality research output. The smart university is described through the V-SMARTH model (Duc et al., 2020). It consists of 6 basic components of digital resources, open-access learning materials, virtual learning environment, individualized education, interactive learning, and digital platforms. These elements come together in three pillars: digitization, digital learning models, and a comprehensive digital transformation process. Digital technology is a necessary and insufficient element to complete innovation. It increases expectations about the availability and flexibility of the learning experience while creating opportunities to respond to challenges in new ways and opening up other opportunities previously unaddressed (Dewar, 2021).

Innovative Teaching and Learning: For the changing landscape of employment and labor market trends and significant technological advances that automate pattern-based work, universities must adapt by providing personalized, technology-enhanced, on-demand learning in multiple modes (Chung et al., 2020; Etzkowitz, 2017; Gibb, 2012). Innovations in teaching and learning involve moving beyond the banking model of education described by Paulo Freire and moving to a model of critical dialogue and student-centered learning, which enables students to get at higher-order thinking skills. Traditional models of information transfers in higher education assume students are empty vessels to be filled up with specific content knowledge to perform a specific job in the labor market. We see now that such education does not develop the requested critical thinking skills for a disrupted work environment. Students need hands-on, real-world experience that taps their prior knowledge and encourages them to fail and try again. Innovations can come within the classroom through faculty development initiatives and cultures of teaching changes, or they can come from the type of education offered.

The degrees and certifications offered by HEIs are shifting in some innovative education circles. There are structural innovations within and across HEIs that can be observed. For example, the marginal change model (jukebox university) is a multi-campus training model with high flexibility, starting with interoperability and personalized training characteristics. It allows students to earn credits in person and online at partner network universities (MOHE, 2018). Students are granted

graduate diplomas and certificates on new modules aligned with the cognitive skills needed in the 4IR. It includes trends for radical changes to how content, skills, and competencies are delivered to learners. COVID-19 has sped up this trend in areas where internet access and affordable data are available. In this case, nano degrees, micro-credentials, and badges are awarded through non-campus university models, and no training programs for defined majors are offered. This business-oriented training model is capturing the interest of a new generation of digital natives and is also a response to the unsustainable cost of attending university in many countries.

Innovations in teaching and learning are also occurring as HEIs take student experience more seriously. Curricular design and pedagogy align with the learning sciences so that teachers and students know their content knowledge, skills, and competencies that can be applied in various contexts. Educators are encouraged to bring their research into the classroom and not create a siloed approach between teaching and research. Assessment methods are used and constructively aligned in such classrooms and university programs to achieve the expected learning outcomes and the teaching and learning objectives. The teaching methods chosen are meant to promote students' understanding of and commitment to life-long learning. Lifelong learning includes key cognitive traits such as curiosity and initiative, a commitment to critical inquiry, information-processing skills, and a willingness to experiment with new ideas and practices. Innovative teaching and learning activities foster student creativity, design thinking, exploration, and an entrepreneurial mindset. The university should be structured to stimulate and support the development of entrepreneurial and digital mindsets and skills while having quality assurance and control procedures in place.

The third area of innovation is a collaboration between governments, HEIs, and industry. The cost and scale of the demands for talent development and scientific advancement require new relationships between these stakeholders. Innovative HEIs are emerging as physical sites for co-location and research collaboration with industry and as brokers of relationships between young entrepreneurs and potential mentors, supporters, and funders. This is further elaborated on as we discuss specific innovations in the R&D space in Section 3.2.

Innovation-Driven Research: Although exploiting know-how becomes the third university mission, intensive, cutting-edge knowledge creation is still important. For this purpose, high-impact publications and patents filed (all fillings, all jurisdictions), patents issued (all jurisdictions), number of licenses, number of licenses to spin-outs, and gross license income received are measured. In particular, the research is mainly transdisciplinary or interdisciplinary, in which scientists, engineers, and designers of many disciplines work together. In contrast, the disciplines are no longer one-to-one related to individuals. These research results benefit the community's socioeconomic well-being (Etzkowitz, 2017; Gibb, 2012).

In addition, university research has an entrepreneurial nature and innovation orientation. Entrepreneurship is no longer seen as a means of enriching yourself at the expense of others. University research activities develop science, technology, arts, social sciences, and humanities.

They can innovate to respond to challenges and opportunities to increase the added value of the economy and social media to advance and realize a strong nation and prosperity. In particular, many young people are interested in creating their own life rather than being a cog in the wheel of a large enterprise. As a result, in addition to seeking industrial employment, students are active in creating new, technology-based firms of their own, and such firms can be very successful. This trend was well-developed in Asian countries.

Ecological and Social Norms: HEIs are ecosystems themselves. They maintain networks, policies, and physical structures that can support sustainable environmental health and inclusive human well-being. It means that many different organizational areas of the institution work together toward a set of collective goals or institutional outcomes. These often relate to research, student success, staff satisfaction, and community engagement. Increasingly, it relates to the role of the HEI in contributing to the awareness of and action around the 17 SDGs (Chankseliani & McCowan, 2021).

The HEI impacts community sustainable development awareness through research, curriculum, community-based learning, and programming. It promotes related social norms (such as activities to pay back, support students in need, and help the poor and people affected by natural disasters). Lastly, information ethics are emphasized, including academic integrity, moral behaviors, and electronic security measures. Part of being an ecologically sustainable ecosystem is being an ethical institution.

Specific Innovation

Specific innovation is the third pillar in our Innovative Higher Education Institutions mapping. This is usually focused on a research-based development approach to innovation where funding is provided, and promotion emphasizes the creation of new technological and software-based capabilities that have applications in the marketplace. There are several forms this can take, including pioneering innovation, best practice innovation, and technological innovation. Each HEI pursues strategies relative to its context, goals, and market segment applicability relative to its mission. Pioneering innovation is often most associated with the term innovation. Pioneering innovation occurs when a brand-new product, service, or method of doing something is introduced into the market. This type of innovation is rare. Everything is a remix, and creating a new product, service, or way of doing something in a completely original form as a first occurrence is unlikely. Pioneering innovation (i.e., R&D-based innovation) is an invention. The HEIs that successfully realize this type of innovation will become the first movers which make disruptive changes in processes, labor markets, and procedures. However, teaching-intensive HEIs prefer open innovations (i.e., non-R&D-based). In this case, they will become fast followers thanks to their higher-end capabilities for technological absorption and innovation, but they will not support R&D and technological generation.

Rating Innovation-Driven Universities in Vietnam

Using the definitions above, we categorized the level of innovation in 10 Vietnam HEIs using the UPM indicators and methodologies, as described below.

Method: Criteria and Data Collection

In attempting to measure the 4IR Responsiveness of HEIs, a UPM rating system was developed (UPM 2020). The main objective of this rating system is to promote benchmarking among universities against five core 4.0 education characteristics: *Entrepreneurial Spirit, Innovative Approaches, Digital Transformation, Personalized Education, and Ethical Values*, which describe well the above-discussed model for assessment of innovation-driven universities. Indeed, the performance evaluation of the UPM involved 52 indicators across eight categories. It covers Strategic Ambition, Education, Research, Innovation, University Ecosystem, Digital Transformation, Internationalization, and Community Services. There are indicators reflecting characteristics of the university as a whole (and include two core clusters of traditional education and research base), general innovation, and specific innovation options). Besides traditional indicators, which often appear in the existing world ranking and rating systems, the UPM rating has further developed 24 new criteria. These are directly related to the elements of 4IR, especially strategic management activities, entrepreneurship and personalized education, innovation ecosystem, sustainable development, and lifelong learning support (UPM 2020, see also Table 1).

In this paper, 32 of the 52 UPM indicators were identified as directly relating to 4IR transformation demands, e.g., instead of the traditional indicators of student employability, the student startup businesses were relevant. The 32 indicators are divided into four subcategories: Education, Research and Innovation, Digital Transformation, and Ecosystem and Actions. Education covers all elements of mindset changes, leadership and governance, people and perspectives, and innovative teaching and learning. The ecosystem and actions subcategory cover elements of the university ecosystem and ecological and social norms. These rated criteria and indicators and their contents are detailed on the UPM rating website (UPM, 2020). We used the data from 10 universities to explore how they measure up relative to the criteria defined and implemented in the UPM (UPM, 2020).

The indicator can express attributes, status, level, or changes in the objects examined, thus serving as the basis for rating. For benchmarking, an indicator is a concrete and verifiable description or a figure concerning the desirable properties of activities. The indicators can be qualitatively or quantitatively measured. The indicators rated by statistical numbers are relative to the average benchmarking points of the top 1,000 universities worldwide according to the ranking. The indicators are assessed qualitatively and holistically on a scale of 1 to 6 based on the ASEAN university network (AUN-QA) quality assurance model. A measure of 4 indicates a good benchmark, whereas a 5 or 6 indicates better than adequate or world-class. The indicator benchmarking points are presented in Table 1.

Rating data were collected from 10 (research-oriented) engineering and technology universities in Vietnam that voluntarily participated in the UPM assessment in the 2020 term. Most institutions have similar sizes, research reputations, and graduate programs. A similar approach was applied to innovation ranking (Hall, 2020). These are Hanoi University of Science and Technology, VNU University of Science, VNU University of Engineering and Technology, Thuyloi University, Transport and Communication University, Hanoi University of Civil Engineering, Hanoi University of Mining and Geology, Hanoi University of Pharmacy, Phenikaa University, and the Hue University of Science. All data were self-reported by the universities according to the UPM criteria and the procedure provided for self-evaluation guidelines. These self-evaluated reports, however, were submitted to the UPM team, then reviewed and confirmed via evidence attached to the report by the UPM assessors. The ten universities' scoring was obtained separately for each university. However, in Table 1, only the minimal, maximum, and average scores are presented for copyright reasons and research purposes. The minimal and maximum scores are considered critical cases, while the average value can give a general view of these participating universities and whole Vietnamese HEIs. These data are presented together with the benchmarking points in Figures 3-6.

Table 1: Rating Data Collected from 10 Engineering and Technology Universities in Vietnam in the Form of Benchmarking Point (Bench. Point), Minimal Achievement (Min. Value), Minimal Achievement (Max. Value), and Average Achievement (Average Value).

No	Criteria and Indicators	Bench. point	Min. value	Max. value	Average value
1	Education				
1.1	21st Century University Alignment	6	5	6	5.2
1.2	Student Centric Policies and Processes	6	4	6	4.7
1.3	Quality of incoming students	24	15	24	19.2
1.4	Size of academic faculty quality	70	34.4	69.7	51.5
1.5	Faculty reputation	20	10.7	25.2	16.6
1.6	4IR Responsiveness in Program Structure and Contents	6	2	7	4.3
1.7	Personalized Learning	6	4	5	4.1
1.8	Student Teaching and Research Assistantship Policies	6	4	6	5.1
2	Research and Innovation				
2.1	Research productivity	1.2	0.5	2.8	1.2
2.2	Research Impact	4.5	3	6	4.0
2.3	Scimago Research Index	4	0	4	1.2
2.4	Nationally Recognized Intellectual Property	25	0	36	8.5
2.5	Globally Recognized Intellectual Property	6	0	4	0.9

2.6	Budget for Research and Innovation	20	8.6	34	16.8
2.7	Start-up Businesses and Spin-off Companies	5	0	10	3.8
2.8	Scimago Innovation Index	4	0	4	1.2
3	Digital transformation				
3.1	Information Analysis and Management	6	4	5	4.3
3.2	Digital scholarly resources	20	1.7	25	9.7
3.3	Learning resource access	5	0.1	22	4.1
3.4	Interactive Learning	2	0	7	2.2
3.5	MOOC and Digital Lessons	5	1	8	2.7

No	Criteria and Indicators	Bench. point	Min. value	Max. value	Average value
3.6	Blended Learning	50	25	50	33.8
3.7	Application of Cyber Physical System (CPS)	2	0	5	1.5
3.8	Information Ethics	1	0	1	0.5
4	Ecosystem and Actions				
4.1	Research, R&D and Innovation Facilities	7	4	6	5.1
4.2	Creative Co-working Space and Start-up Supports	7	3	6	3.9
4.3	Campus Environment	7	3	5	3.8
4.4	Business and Industry Partners	1	1	4.1	2.2
4.5	Life-Long Learning Capacity Enhancement	1	0.2	1.1	0.5
4.6	Impact of Sustainable Development Research	15	5	27	10.7
4.7	Realization of Sustainable Development Research	2	0	2	1.6
4.8	Social Norm Promotion	5	5	15	8.2

Results and Remarks

Education: As shown in Figure 3, individually, some Vietnamese universities of engineering and technology have approached and even exceeded the benchmarking points, especially for the criteria of 4IR strategy alignment, incoming student quality, faculty quality, faculty reputation, and training program expected, learning outcomes, and contents. The university strategy demonstrates the required responsiveness of entrepreneurial spirit, innovation approaches, digital transformation, and personalized education. The program contents and courses are comprehensive and up-to-date and demonstrate responsiveness to the requirements of the 4IR in both generic outcomes (in particular, entrepreneurial and digital mindset and skills) and subject-specific outcomes (related to knowledge and skills of 4.0 technology and solutions). In particular, new launching programs for basic 4.0 technologies such as IoT, A.I., Big Data, Robotics, Digital Economy, and Creative and Culture Industries exist. However, in general, the traditional approaches in organizational structure and strategy implementation, teaching, and learning process are still dominated. Although the

entrepreneurial mindset was determined in the Vietnamese Qualification Framework, its performance remains slow. The advantages of credit-based training are not fully realized, limiting individualization and personalization in training and encouraging cooperation among the university's faculties and other universities and industries. Few students complete their degrees within the expected timeframe. The average proportion of academic faculty staff with a Ph.D. degree to the total number of academic staff is 51.5%, but it is relatively low (34.4%) for several universities. In particular, for some engineering and technological universities with a long history, the quality of students is modest compared to competitor programs abroad. This quality challenge hinders the industrialization intentions of the country because the necessary talent to modernize is unavailable.

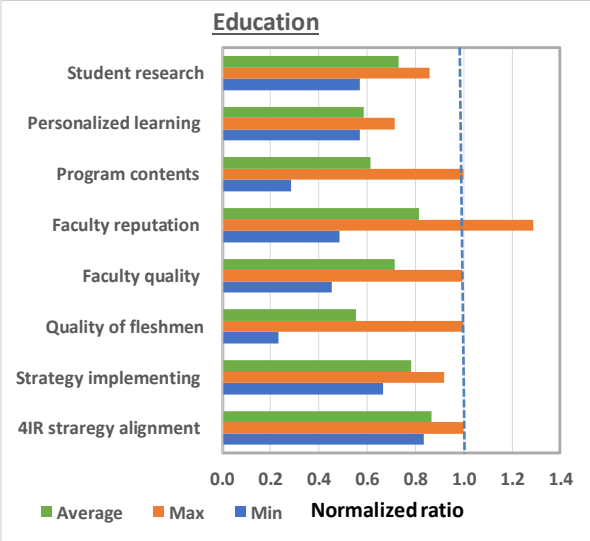

Figure 3. Rating Results for the Indicators of the Education Cluster

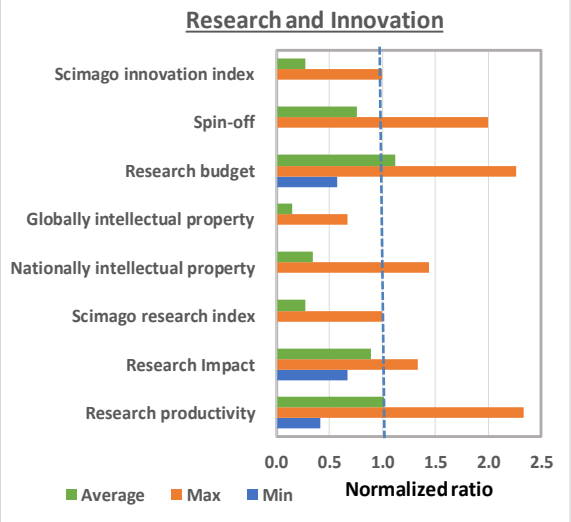

Figure 4. Rating Results for the Indicators of the Research and Innovation Cluster

Research and Innovation: Figure 4 presents the results of the indicators in the research and innovation cluster. Except for the international intellectual property indicator, several universities fulfill and exceed the benchmarking points of the UPM system for research and innovation, particularly for research productivity, research impact, budget, and spin-off companies. These explain why Vietnam has universities in the top 1,000 world universities of Q.S. and Times Higher Education rankings. For the rest, however, the results show poor performance in the Scimago research and innovation index, internal and national intellectual properties, and spin-off companies. It leads to a low average value for those indicators.

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research and innovation index, internal and national intellectual properties, and spin-off companies. This leads to a low average value for those indicators.

Digital Transformation: Figure 5 illustrates the rating results for digital transformation. While the benchmarking points are not high, almost all average values of rated indicators are below these benchmarks. Before the Covid-19 pandemic, many universities were still implementing simple digital strategies, which limited the digitization of paper-based processes and administration services. A complete digital strategy remains absent at most universities, and objectives and KPIs for a digital transformation plan are not defined. Thus, several activities, such as learning resource access and interactive learning, have not been implemented due to a lack of tools. In other cases, data is not available to measure progress. The education programs' online (recorded teaching, live teaching) or/and MOOC courses measured are still limited. Digital lessons are widespread in terms of electronic lectures at the first levels, but the material is rudimentary (such as slide shows and PDFs). Digital classes with recorded teaching and live teaching are rare. The level of application of cyber-physical systems to learning and management is modest. Moreover, information ethics are not entirely ensured, including academic integrity, moral behaviors, and electronic security measures.

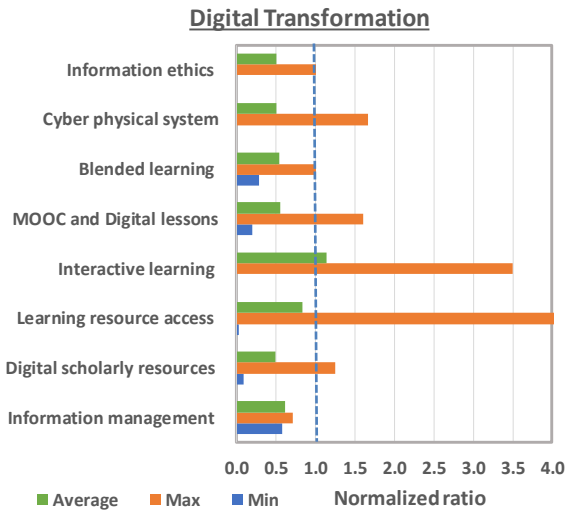

Figure 5. Rating Results for the Indicators of the Digital Transformation Cluster

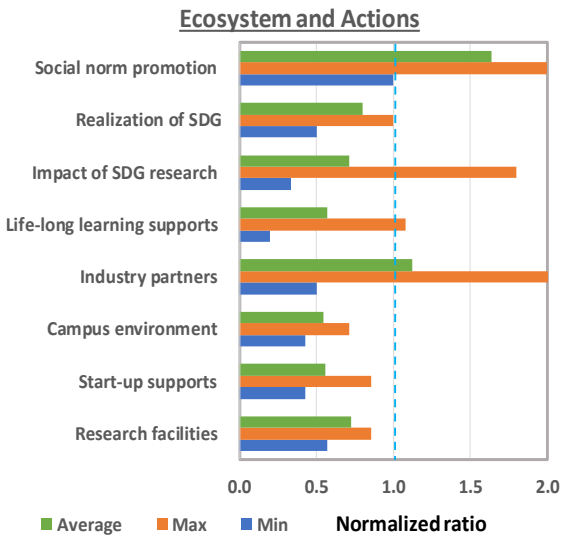

Figure 6. Rating Results for the Indicators of the Ecosystem and Actions Cluster

Ecosystem and Actions: Rating results presented in Figure 6 are indicators of a university's ecosystem and related actions. Compared to the standards of the top 1,000 world universities within the benchmarking exercise, which is understood at the normalized ratio, research facilities, startup support, and campus environment are modest for the ten measured Vietnamese HEIs. While they might use best practices determined by national standards, they are far from performing at the highest global level for these criteria. For instance, institutions have not implemented indicators 4.5

and 4.6 (lifelong learning and research related to SGDs). On the other hand, local community engagement activities are effective. The number of businesses, industries, and organizations that collaborate in student training and research and startup projects, provide funding/grants for customized research, or/and have collaboration in R&D resulting in co-publications and shared I.P. license/industry co-patents is highly established. These universities are vital in promoting university impact on sustainable community development and fostering harmonious social norms. These activities, which attract a wide swath of student bodies, are initiated by student associations.

Conclusion and Recommendations

In this research, the definition of an innovation-driven university is described, and a blueprint is provided to help research-focused HEIs respond to the recent changes in the 4IR. This university model balances the entrepreneurial and ecological characteristics but enables it to strengthen the accountability and autonomy of the university, which is suitable for all five types of universities identified.

Overall, the UPM participated technological universities in Vietnam have a highly qualified and reputable academic staff, are training a large number of students, attract a significant amount of research funding, conduct R&D, are innovation and startup minded, publish many quality articles, and facilitate the production of intellectual properties. However, the university innovation culture is still new. In most cases, HEIs in Vietnam requires a modern and synchronized R&D research environment and excellent startup support. In particular, along with digital infrastructure and mindset changes, the universities need to pay attention to the new concepts and contents of community service activities, in which lifelong learning and sustainable development are priorities.

The 21st century has posed significant challenges for higher education institutions to respond successfully to new demands. A benchmarking tool that fully reflects the characteristics and requirements of the graduate, labor market, and society in the new era will help universities to advance themselves on the higher education landscape of the country and the region, to work out or adjust their strategic approaches and become more effective and relevant institutions. With its five core 4IR education characteristics of entrepreneurial spirit, innovative practices, digital transformation, personalized education, and ecological and social norms, the UPM rating system is suitable to guide and inform university transformations. Moreover, UPM can show the tasks that higher education institutions should perform, as well as priorities and targets that must be reached, to guide their strategic planning. Moreover, benchmarking metrics and indicators can provide universities with directions for improvement and act as critical drivers for universities to move from a closed to a more responsive model.

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Strategic Alliances in Institutions of Higher Education to promote Sustainable Development Goals: A case study from two universities in Taiwan

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ABSTRACT

Higher Educational Institutions (HEIs) are vital contributors to achieving the United Nations' Sustainable Development Goals (SDGs). It is essential in meeting sustainable development challenges, including educating excellent teachers, producing ground-breaking research, and connecting services to communities. This research aims to explore the effects of forming a strategic alliance between two universities on facilitating the academic publication of SDG-related topics and determine the benefits of strategic alliances between HEIs. Data were collected from SciVal® for the period 2004 to 2020 to determine the numbers and percentages of joint authorship papers between the two universities related to the 16 SDGs and explore the growth trends in joint authorship publications on topics related to SDGs between the two case universities after their strategic alliance in 2012. Results showed that scholars from the two universities focused more on SDGs 2, 5, 7, 13 than the other goals. Regression analysis was also used to examine if the defined variables significantly affected the increase of joint authorship publications. The results showed that universities might benefit from the strategic alliance, bringing collaboration on SDG-related research. This research sheds light on strategic alliances between two institutions in Taiwan with different orientations, which can be used as a reference in higher education to promote sustainable development goals.

Keywords: Higher Education, Regression Analysis, Strategic Alliances, Sustainable Development Goals, Case Study

Introduction

In September 2015, all 193 Member States of the United Nations adopted an inclusive plan, "The 2030 Agenda for Sustainable Development," which provides a shared blueprint for peace and prosperity for people and the planet to end extreme poverty, fight inequality and injustice, and protect the environment now and into the future (United Nations, 2015; Lee et al., 2016). The notion of Sustainable Development Goals (SDGs) is not a new concept but an extension of the Millennium Development Goals (MDGs) proposed in 2000 to tackle the indignity of poverty. The SDG agenda was designed to mobilize multiple stakeholders' creativity, knowledge, skills, and resources to take global action by embracing a wide range of interconnected economic, social, and environmental dimensions of sustainable development for our planet.

The SDGs address a wide range of specific issues such as poverty, hunger, health, education, gender equality, water and sanitation, energy, industry and innovation, infrastructure, consumption and production, climate, life below water and on land, and justice. A list of the 17 goals is listed in the Appendix. The goals are integrated into a global framework with strong buy-in and adoption among governments, businesses, academic institutions, funding agencies, civil society, and local communities (World Health Organization, 2016). The importance of education for sustainable development is highlighted in a number of the goals, such as for all learners to "acquire the knowledge and skills needed to promote sustainable development" (Avelar et al., 2019), which are directly relevant to universities. Additionally, a survey conducted by the Times Higher Education (THE) showed 79% of students agreed that universities should play a key role in promoting sustainable values and skills for the next generation. 69% agreed that acquiring knowledge of sustainability development during their studies could benefit their future job searches (THE, 2021a). Therefore, the SDGs provide a unique opportunity for higher education institutions (HEIs) to demonstrate their willingness and capability to play an active and meaningful role in their respective countries development and contribute towards global sustainable development.

The SDGs provide a universally agreed-upon organizing structure for HEIs to promote awareness of global sustainability issues. Viewed from another angle, HEIs can provide the knowledge, innovations, and solutions to underpin the implementation of the SDGs by addressing the challenges that require new knowledge and new ways of doing things (Fleacă et al., 2018). Moreover, HEIs can also support the development of the professional knowledge, capabilities, and motivation of future leaders, decision-makers, innovators, entrepreneurs, and citizens who can contribute to achieving the SDGs (López et al., 2019).

The THE Impact Rankings showcase the work of universities as essential actors in the quest for sustainable development (Hess and Collins, 2018; Žalėnienėa and Pereira, 2021), as they help to discover new technologies that make societies, communities, and businesses around the world more sustainable and resilient (Hansen and Stilling, 2021; THE, 2021b). To implement SDGs, the Ministry of Education in Taiwan (2018) has promoted the "University Social Responsibility

Practice Project" focusing on "local care," "the industrial chain," "sustainable environment," "food safety and long-term care," and "international connections." It encourages universities and colleges to actively connect with and enhance their contribution to local communities and regional schools, promote the development of urban and rural education, and support sustainable urban and rural, industrial, and cultural development. However, to effectively achieve SDGs, global organizational partnerships for sustainable development are necessary (Casarejos et al., 2017). Accordingly, many HEIs around the globe have voluntarily formulated and implemented sustainability-related initiatives on their own (Freidenfelds et al., 2018). Based on the results of the latest 2021 THE Impact Rankings (THE, 2021c), there were a record-breaking 35 Taiwanese universities on the list, a sharp increase from the year 2020, documenting a growing trend among that universities and colleges in Taiwan to become involved with sustainability initiatives and transformations aligned with their missions. For example, two southern Taiwan universities, National Sun Yat-sen University (NSYSU), a comprehensive public university, and Kaohsiung Medical University (KMU), a private medical university, started their strategic alliances in 2012. They explored a series of sustainable strategies to generate knowledge about, awareness of, and solutions to environmental issues to help face these challenges. Cooperative partnerships among HEIs play a key role in achieving sustainability by initiating and developing teaching, curriculum, research, community outreach, and everyday activities (Sonetti et al., 2016). As mentioned above, the first main idea of the study would focus on the percentage of joint publications related to SDGs from 2004-2020 by NSYSU and KMU to explore the effects of the strategic alliances.

In recent years, there has been a dramatic increase in strategic alliances among global multinational firms and institutions of higher education to tackle complex industrial problems of a significant business or societal significance through cooperative partnerships (Saffu and Mamman, 2000). The higher education sector also has a growing trend of alliances and mergers to achieve economic benefits and research productivity (Patterson, 2001; Ahmed et al., 2015). Nowadays, more and more studies are focusing on promoting SDGs in HEIs (Fuchs et al., 2020; Groulx et al., 2021; Zahid et al., 2021). In Taiwan, the government at this stage was also actively promoting learning, teaching, and research based on the SDGs framework in HEIs. However, few examinations of the HEIs' pursuit of SDGs through strategic alliances (Leal Filho et al., 2015) and no related studies in Taiwan. Thus, there is a need to investigate the Taiwan HEIs' strategic alliances regarding SDGs. Accordingly, this study primarily focused on the strategic alliances of two universities, NSYSU and KMU, to promote SDGs. As stated above, the second main idea of the study would put more emphasis on the change in percentages of publications on SDGs by NSYSU and KMU after the strategic alliance in 2012. It also extensively discusses how both universities use their strengthened items on SDGS to help each other in different research fields to gain complementary advantages.

In the current study, we combined the above indicators in the sustainability index to investigate strategic alliances between NSYSU and KMU. First, we analyzed the growth trends of the percentage of joint publications related to SDGs by authors at the two universities for 2004-2020

to explore the effects of the strategic alliances. Second, we compared percentages of jointly authored publications on SDGs before and after 2012 to determine changes in rates after the strategic alliance of the two universities and further explore whether the two universities gained complementary advantages by helping each other in different fields of research. To investigate how the two universities cooperated and integrated sustainable strategies into their routine campus operations, curriculum development, and local, regional, national, and international community outreach, regression analysis is used to examine the factors that significantly affect the production of jointly authored publications on SDGs. The following research questions (RQs) guided this study:

RQ1: Can forming a strategic alliance between two universities facilitate academic publication on SDG-related topics?

RQ2: What are the growth trends in joint authorship publications on SDG topics between the 2 case universities after their strategic alliance in 2012?

RQ3: What are the significant factors affecting the percentages of joint authorship publications on SDGs during the strategic alliance?

Literature review

Promoting SDGs in higher education institutions in Taiwan

Recently, scholars have emphasized the impact of higher education on sustainability development (e.g., Fehlner, 2019; Leal as agents of change (Shields, 2019). Littledyke et al. (2013) describe the following ways in which higher education institutions can play critical roles in education for sustainability: 1) research and teaching can support the development of sustainability principles across the disciplines, 2) the practices carried out in different disciplines and through interdisciplinary collaboration can broaden perspectives and enrich outreach activities; 3) an institutional culture of sustainability can increase awareness of university staff as well as local and extended communities; 4) higher education institutions have significant responsibility for the preparation of next-generation professionals; and 5) by implementing sustainable campus practices (e.g., reducing greenhouse emissions and efficient use of energy), they help reduce the ecological footprint. Thus, developing a sustainability culture on campus activities can raise stakeholders' awareness of sustainability and substantially impact the environment, economy, and society (Findler et al., 2019).

Taiwan has taken a long time to promote environmental education, including ecological conservation, resource recycling, energy saving, and carbon reduction, which have become everyday environmental protection actions on campuses (Tsai, 2012). However, in recent years, the Ministry of Education has given more attention to the United Nations' sustainable development goals and global changes by promoting education for sustainable development (Pauw et al.,2015).

In 2017, the Ministry issued the document "Key Points of the Ministry of Education's Promotion of a Social Responsibility Practice Program for Colleges and Universities," which emphasizes the social responsibilities of higher education, promotes cooperation between communities and universities, and encourages students to engage in social action (Ministry of Education, 2020). The Ministry of Education has also announced the importance of education for sustainable development through school education to tackle environmental issues and produce citizens who make wise decisions to achieve environmental integrity, economic feasibility, and social justice. Also, in response to the UN's Sustainable Development Goals, the document "Taiwan's Sustainable Development Goals" and related plans were released at the end of 2018 (Ministry of Education, 2020). Following international trends, Taiwan universities have taken the initiative to promote sustainable development by increasing sustainable education-related activities, conducting relevant research, and developing new technologies that make societies, communities, and businesses worldwide more sustainable and resilient (Jenny Su and Chang, 2010). In addition, Taiwan HEIs are responsible for developing skilled human capital to assist in the transition to sustainable practices. To achieve this comprehensive mission, there must be firm commitment and institutional engagement within the HEIs to promote ethical and responsible values, goals, and actions (Wu and Shen, 2016).

Another strategy to promote SDGs in HEIs is integrating SDG-related topics into research and identifying relevant research outputs (Purnell, 2022). The THE Impact Rankings also measure a university's contributions to SDG-related research and emphasize research in each Goal (Times Higher Education, 2021b). Since the 17 SDGs cover a wide variety of topics, most research can be mapped onto one or more SDGs. The Scopus publication database developed by the publishing company Elsevier provides the metrics data on how each paper is mapped onto the SDGs. Elsevier collected keywords related to SDGs 1 to 16, supplemented by additional keywords and related topics identified by artificial intelligence. The methods and the search strategies were published by Rivest et al. (2021).

Activating partnerships through strategic alliance in Taiwan

Strategic alliances originated in the corporate world and have been in various fields, including agriculture, aviation, tourism, and medical care (Borsch, 1994). Due to the strong culture of competition in the corporate, strategic alliances are formed to create mutual advantages for partners. In recent years, the education sector has increasingly emulated corporate practices with the liberalization, marketization, and internationalization of education. It includes forming strategic alliances to bring new opportunities and visions to HEIs (Gulati et al., 2000). While there is currently no universally accepted definition of the strategic alliance due mainly to its adaptability to diverse contexts and enterprises, scholars' various explanations of the concept capture its core meanings. Kale et al. (2000) proposed that strategic alliances refer to cooperation between individuals or organizations to maintain or enhance their competitive advantages, consider long-term interests, and unite to pursue common goals, hoping to control the destinies of individuals or

organizations. Wolf (2000) described a strategic alliance as a coalition of two or more organizations to respond to the commercial environment, survive or grow, and achieve specific strategic purposes through mutual support and cooperation, such as joint contract management, chain/direct sales, and mergers. Knoke (2001) asserted that a strategic alliance is an agreement between two or more manufacturers to cooperate for specific purposes to reduce risks and expand their business areas in rapidly changing environments. Based on these perspectives, in this study, a strategic alliance is conceived as follows:

To respond to the environment, two or more organizations survive, enhance their competitive advantages, and share responsibilities, risks, and rewards through resource sharing and complementary functions. To pursue common goals, they cooperate strategically while each retains independent power.

A school is a non-profit organization whose primary Goal is to seek the greatest well-being of teachers and students. Therefore, a strategic alliance of schools can be defined as follows: “Two or more independent schools, through cooperation, effectively integrate school resources, carry out sharing of resources and curriculum, teaching cooperation, administrative support, and academic research (Patterson, 2000; Ripoll-Soler and de-Miguel-Molina, 2014). Thomas (2015) indicated that complementarity and sharing, including information technology exchanges, knowledge innovation sharing, and teaming to enhance competitive advantages, can bring new opportunities to teachers and students. Therefore, schools should make good use of strategic alliances, integrate educational resources, and promote inter-school exchanges and cooperation to enhance sustainable operations and development in universities.

In Taiwan, domestic universities have strategic alliances that serve various purposes. For example, in January 2008, the National Tsing Hua University, National Chiao Tung University, National Yang-Ming University, and National Central University formed the “Taiwan United University System” to implement the integration of teaching, research, and administrative resources and promote cooperation in international affairs. In November 2012, the Taiwan Comprehensive University System, consisting of National Cheng Kung University, National Sun Yat-sen University, National Chung Cheng University, and National Chung Hsing University, created a joint alliance for cross-university course enrollment recruitment of students, collaborative activities, and other cooperation matters. On December 26, 2016, The National Defense University and National Chung Hsing University signed a strategic alliance to promote resource sharing and industry-university co-prosperity. Alliances may be formed based on geographic location, school type, or school needs. Other alliances include the long-established Excellent University Consortium of Taiwan, which consists of 12 private universities, and the Taipei Union University system, consisting of the National Taipei University of Technology, National Taipei University, Taipei Medical University, and National Taiwan Ocean University. All are located in the greater Taipei metropolitan area in a juxtaposition of professional universities with different academic disciplines. By promoting cooperation among institutions, strategic alliances provide students with

more diversified learning opportunities, avoid problems that may arise separately, and enhance members' market competitiveness through unity (Cai and Yang,2016).

In this study, the 2012 NSYSU and KMU Alliance serve as a case to explore the effects of strategic alliances on the promotion of SDGs. NSYSU and KMU are index universities of Taiwan's public comprehensive and private medical systems, respectively, located in Kaohsiung City. The close geographical proximity and the different natures of the two universities have resulted in their strong complementarity, which is conducive to substantive cooperation and improvement of teaching and research. In addition, the two schools have long cooperated in supporting rural education and medical services. Drawing on the advantages of their location and complementarity, NSYSU and KMU integrate resources to enhance the effectiveness of learning, teaching, research, and social services, aiming to become one of the world's top joint university systems. Their resource sharing extends to libraries, computers, internet access, merchant discounts, vehicles, sports facilities, parking, and other aspects. Students can take courses across schools, which recognize each other's credits, and participate in cross-campus programs and international cultural exchange activities. After years of in-depth cooperation between the two universities, NSYSU and KMU have also achieved remarkable results in the use of cutting-edge mass spectrometry in food safety and other innovative applications, the development of natural marine drugs, an intelligent system for diagnosing Alzheimer's disease, and the assessment of the risk of air pollution to human health. In the future, both universities will continue to invest in research and development, cultivate cross-domain research talents, and actively pursue frontline discoveries. These cover fields such as artificial intelligence and electronic engineering applied to medical care, reaping the benefits of their academic alliance and maintaining Taiwan's medical science and technology leader. Besides integrating resources to achieve excellence in teaching and research, these expected benefits include expanding students' learning horizons by providing more diversified experiences. It includes strengthening social and community service liaisons, supporting regional development functions, and increasing both institutions' international visibility and competitiveness (NSYSU and KMU strategic alliances news, 2019).

Research Significance

In a higher education ecosystem with limited financial resources and insufficient student resources, strategic alliances may allow schools of different types to achieve complementarily and schools with high homogeneity to make progress together (Flora and Hirt, 2010). However, whether the cooperation can achieve equitable sharing and true reciprocity is an essential factor influencing the success of a strategic alliance. There is a subtle but complex relationship between competition and cooperation between universities. Achieving the common good is the ultimate Goal of a strategic alliance and the most significant challenge (Stensaker et al., 2016). Therefore, this study makes a theoretical contribution to addressing the issue of reciprocity in alliances by adding new insights through an in-depth study of NSYSU's and KMU's experiences cooperating in promoting SDGs. It focuses mainly on jointly authored publications, sustainable campus operations, curriculum development, and local, regional, national, and international community outreach to explore how

both universities achieve mutually beneficial win-win cooperation through strategic alliance. Finally, this particular strategic alliance can be a reference for policymakers, government agencies, and educators to promote sustainable development through higher education.

Methodology

The Goal of this research was to explore how a strategic alliance between two universities could facilitate academic publication on SDG-related topics and examine the growth trends in joint authorship publications on topics related to SDGs between the 2 universities after the strategic alliance. Data were obtained from Scopus, a subscription-based academic publication database. The processes of data collection and data analysis are described below.

Data Collection

We used the Research Areas menu of the online tool SciVal® to search for publications in the Scopus database related to each of the SDG targets. A comprehensive set of queries can define Research Areas, referred to as "Elsevier 2021 SDG mapping," developed by Rivest et al. (2021). We used a set of queries for assessing a university's SDG-related research impact and for its international rankings, such as by the THE rankings. We then selected publications related to SDGs by authors of both universities from 2004 to 2020 in the database and compared the numbers of joint authorship papers before and after establishing the strategic alliance in 2012.

Data Analysis

To understand how joint authorship publications between the two universities changed before and after the strategic alliance, we calculated the total number of publications related to SDGs, and the percentage of joint authorship papers in each of the 16 SDGs. Next, we used the open-source software R to conduct a cluster analysis to explore whether the two universities collaborate on specific SDG research topics. clusters of SDGs based on the growth patterns of joint authorship into three groups, designated as "high," "medium," and "low," were created. It helps illustrate which clusters of SDGs are essential to each university and how the percentage of joint authorships changes after the strategic alliance. We also drew charts and diagrams to visualize the Inter-relationships among SDGs of joint-authorship publications and the growth trends. Finally, regression analysis was applied to examine whether the defined variables significantly affected the percentage of joint authorship publications and whether a strategic alliance between the two universities facilitated collaborative research.

Results

First, the total number of SDG-related publications of both universities is shown. As shown in Figure 1, these totals increased for both universities from 2004 to 2020. Figure 2 shows the percentage of joint authorship publications from both universities, which also increased over the

16 years. A detailed breakdown of the percentages of joint authorship publications on each SDG over the years is shown in Table 1. Because some publications are cross-disciplinary, they were not classified under a single SDG. We used a Sankey diagram to show how the publications overlap to further examine the inter-relationships among joint-authorship SDGs. As shown in Figure 3, neither university had joint-authorship publications on SDG10. Within the collaborations, SDG 1 has the highest connections to other SDGs, followed by SDG14, SDG3, and SDG6.

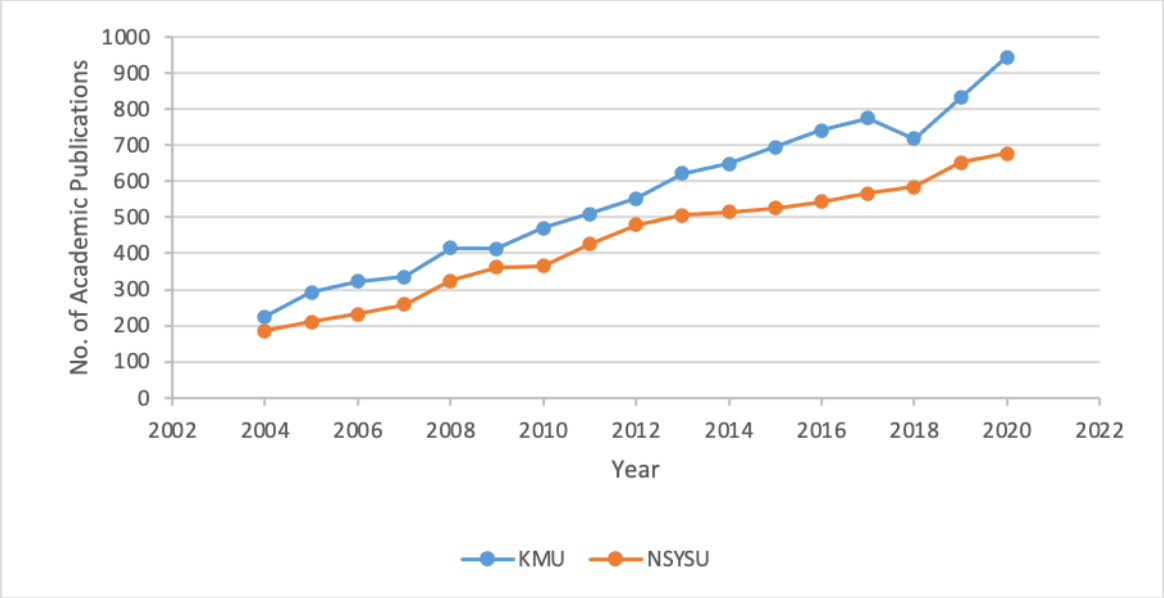

Figure 1: Total number of SDG-related publications

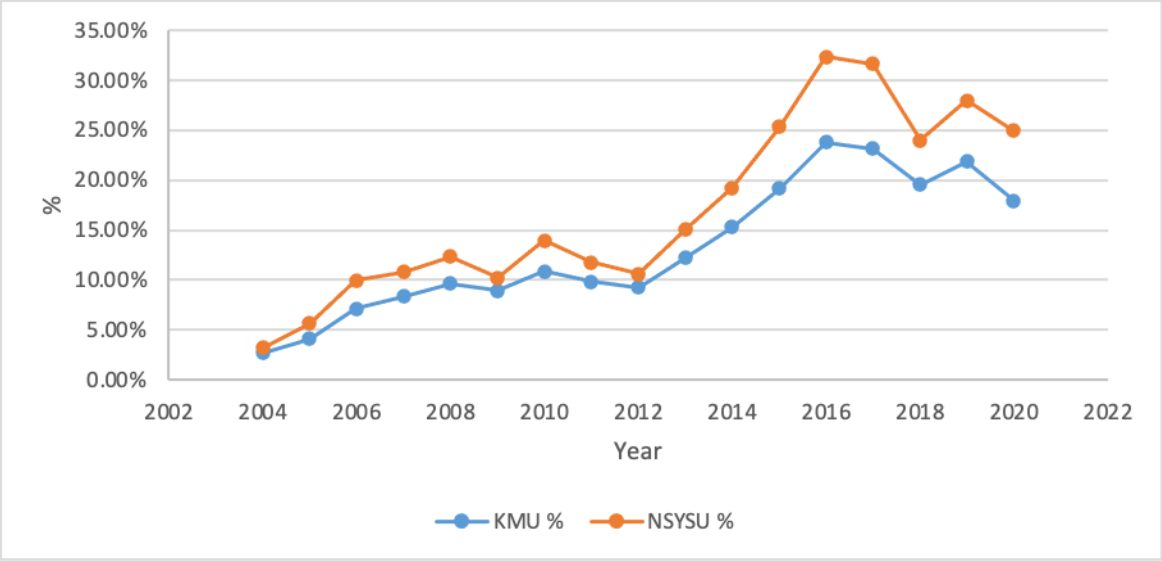

Figure 2: Percentages of joint authorship publications

Table 1: Publications count and percentage of joint authorships

	Publications Count						% of Joint Authorships			
	KMU		NSYSU		Joint Authorship		KMU		NSYSU	
Years / SDGs	2004-2011	2012-2020	2004-2011	2012-2020	2004-2011	2012-2020	2004-2011	2012-2020	2004-2011	2012-2020
SDG1	99	327	420	862	11	69	11.11%	21.10%	2.62%	8.00%
SDG2	9	30	10	33	-	5	0.00%	16.67%	0.00%	15.15%
SDG3	2,621	5,468	579	1,632	218	993	8.32%	18.16%	37.65%	60.85%
SDG4	26	72	98	222	-	8	0.00%	11.11%	0.00%	3.60%
SDG5	36	90	13	34	-	2	0.00%	2.22%	0.00%	5.88%
SDG6	65	75	151	211	4	19	6.15%	25.33%	2.65%	9.00%
SDG7	12	78	346	709	-	30	0.00%	38.46%	0.00%	4.23%
SDG8	8	22	73	147	-	1	0.00%	4.55%	0.00%	0.68%
SDG9	10	39	208	231	2	7	20.00%	17.95%	0.96%	3.03%
SDG10	16	53	37	95	-	-	0.00%	0.00%	0.00%	0.00%
SDG11	36	52	88	172	1	12	2.78%	23.08%	1.14%	6.98%
SDG12	4	17	68	113	2	3	50.00%	17.65%	2.94%	2.65%
SDG13	4	29	33	128	-	14	0.00%	48.28%	0.00%	10.94%
SDG14	9	62	149	265	5	29	55.56%	46.77%	3.36%	10.94%
SDG15	4	21	58	116	2	9	50.00%	42.86%	3.45%	7.76%
SDG16	24	88	31	77	2	4	8.33%	4.55%	6.45%	5.19%

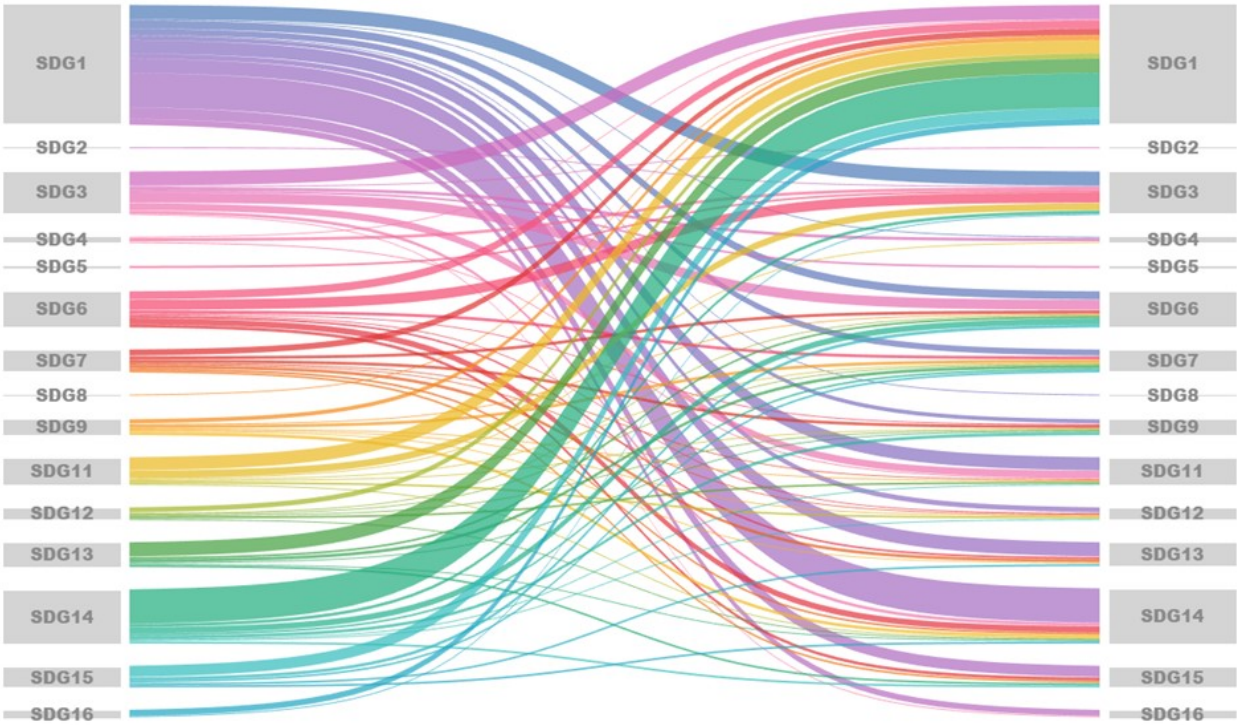

Figure 3: Inter-relationships among SDGs of joint-authorship publications

Figure 4 shows the changes in percentages of joint authorship publications over time. Based on the change rate of percentages of joint authorship publications, we divided the 16 SDGs into three groups: high, medium, and low, as shown in Table 2. The groups of SDGs were different for the two universities, reflecting their differences in academic focus, which were also shown in their increases in a joint publication. For example, the increased rate of joint authorship publications for SDG3 falls into the medium group for KMU; as for NSYSU, the change rate for joint authorship publications of SDG3 falls into the high group, which increased by about 24% after the strategic alliance. For both universities, co-authored papers related to SDG2, SDG6, and SDG13 were in the high group after 2012, while those associated with SDG10, SDG12, and SDG16 decreased after 2012.

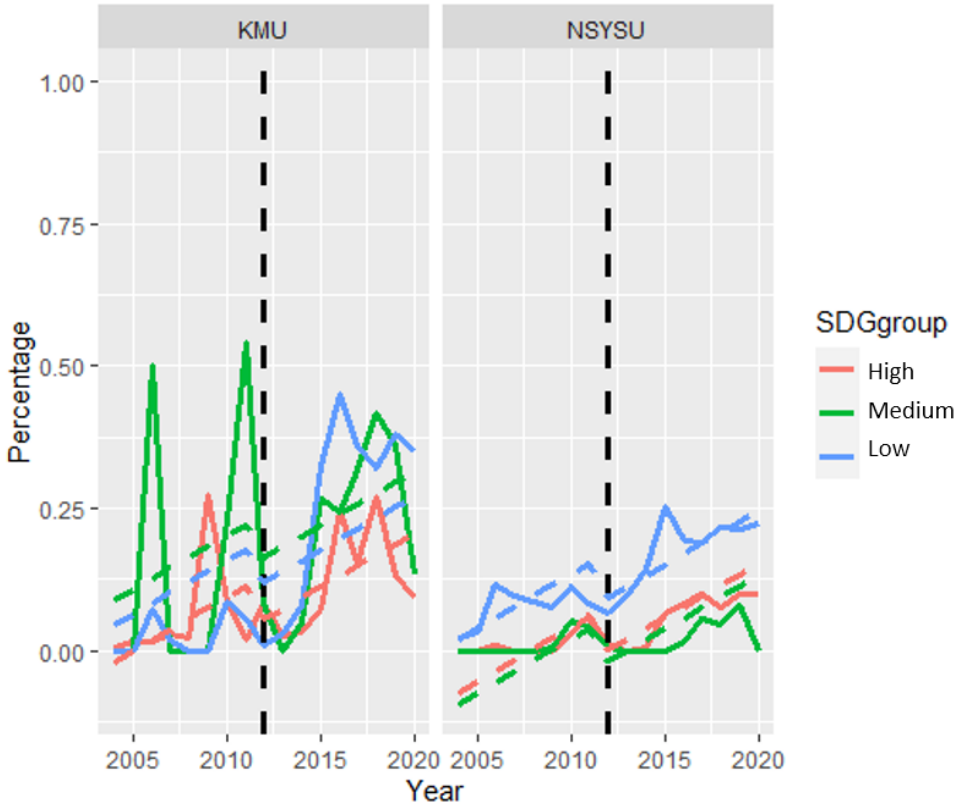

Figure 4: The rate of change in percentages of joint authorship publications

Table 2: SDG groups by change rate

University	KMU		NSYSU	
Groups	**SDGs**	**Change Rate**	**SDGs**	**Change Rate**
High	SDG01	0.113	SDG02	0.119
	SDG02	0.110	SDG03	0.240
	SDG06	0.207	SDG05	0.056
	SDG07	0.380	SDG06	0.066
	SDG11	0.228	SDG13	0.092
	SDG13	0.427	SDG14	0.066
Medium	SDG03	0.100	SDG01	0.053
	SDG04	0.103	SDG04	0.043
	SDG05	0.017	SDG07	0.044
	SDG08	0.037	SDG11	0.049
	SDG09	0.060	SDG15	0.049
	SDG10	0.000	SDG08	0.006
Low	SDG12	-0.500	SDG09	0.018
	SDG14	-0.159	SDG10	0.000
	SDG15	-0.067	SDG12	0.001
	SDG16	-0.028	SDG16	0.025

To assess the effects of various factors on the percentages of joint authorship publications, we included year, strategic alliance, university, SDG groups, and an interaction term between school and SDG group as predictors. As shown in Table 3, the year significantly predicts the percentage of joint authorship publications as the number increases with time (β=0.02***, [0.01, 0.03]). We compared the regression results between different groups within each variable, the items in brackets indicating the reference group. The results showed a significant increase in the percentage of joint authorship publications after the strategic alliance (β= -0.08*, [-0.14, -0.01]) and no significant difference between the two schools in the percentage of joint authorship publications (β= -0.05, [-0.11, 0.00]). For SDG groups, compared to the medium group, both the low-SDG group (β=0.11***, [0.05, 0.17]) and the high-SDG group (β=0.06*, [0.01, 0.12]) showed significant differences between schools. As for the interaction between schools and groups, the interaction effect shows that within NSYSU, the low group differs from the medium group in having a positive intercept and a lower slope. In addition, within the low-SDG group, the slope of KMU was significantly lower than that of the NSYSU.

Table 3. Regression Analysis Results

	Percentage of Joint Authorship Publications		
Predictors	Estimates	CI	*p*
(Intercept)	-38.08***	-50.98 – -25.18	**<0.001**
Year	0.02***	0.01 – 0.03	**<0.001**
Strategic Alliance [1]	-0.08*	-0.14 – -0.01	**0.015**
University[NSYSU]	-0.05	-0.11 – 0.00	0.057
SDG group [low]	0.11***	0.05 – 0.17	**<0.001**
SDG group [high]	0.06*	0.01 – 0.12	**0.020**
School [NSYSU] * SDG group [low]	-0.13**	-0.21 – -0.05	**0.002**
School [NSYSU] * SDG group [high]	0.03	-0.05 – 0.10	0.461
Observations	498		
R^2 / R^2 adjusted	0.208 / 0.196		

Notes:
-Alliance: 1=after strategic alliance; 0=before strategic alliance.
-University: NSYSU, KMU
-SDG group: high, medium, & low.

Discussion and Conclusion

Discussion

This research aimed to explore whether a strategic alliance between two universities will effectively promote sustainable development goals. The study echoed the results of Kale et al. (2000), that proposed that strategic alliances focus on cooperation between organizations to maintain or enhance their competitive advantages, consider long-term interests, and unite to pursue common goals. In addition, it also added new value to the complementarity of strategic alliances in HEIs.

By examining the joint authorship of publications related to different SDGs by scholars at both universities, we determined that institutions with diverse missions may benefit from forming a strategic alliance. First, we found that while there was no collaboration on SDGs 2, 5, 7, and 13 before 2012, after the formation of the alliance, the two universities attended to these goals to strengthen sustainable campus operations; curriculum development; and local, regional, national and international community outreach. For SDG2 (zero hunger), the two universities cooperatively developed the "Sustainable Development Plan for Namasia and Kaohsiung Original Township". It aims to ensure sustainable food production systems and agricultural practices through secure and equal access to land, knowledge, financial services, and opportunities for remunerative employment. For SDG5 (gender equality), the two universities have joint curricula on gender equality education and related issues to nurture respect for gender diversity, eliminate gender discrimination, and advance genuine gender equality. For SDG7 (affordable and clean energy) and SDG13 (climate action), the two universities have jointly conducted research and created centers, such as the Taiwan and Sri Lanka Environmental Change Sciences and Technology Innovation Center (TS/ECSTIC). The issues on which the center focuses include marine ecosystems, plant ecology, bio-resources, global warming, and anthropogenic impact on tropical and subtropical regions belts to meet SDGs goals in education and strengthen resilience and adaptive capacity to respond to climate-related hazards and natural disasters in these countries.

Second, previous studies emphasized the importance of organizational partnerships to effectively achieve SDGs (Casarejos et al., 2017; Thomas, 2015). In this study, we further focused on the sustainable development of NSYSU and KMU after the strategic alliance. We found that the two universities gained complementary advantages by helping each other in different research fields. For NSYSU, the percentage of joint authorship publications of SDG3 Good Health and Well-being increased from 37.65% to 60.85% after the strategic alliance. For KMU, while cooperation on SDG 3-related publications grew, SDG 7- and 13-related publications topped the list. As KMU focuses mainly on medicine, pharmacy, and health care, NSYSU's research capacity in natural science and engineering created opportunities for novel avenues of interdisciplinary collaboration. In recent years, the two universities combined their expertise in information technology, intelligent healthcare systems, and disease management to plan for global health cooperation plans to solve healthcare problems and promote the Goal of sustainable well-being.

Furthermore, after years of in-depth strategic alliance, NSYSU and KMU had achieved remarkable results in developing natural marine drugs, an intelligent diagnosis system for Alzheimer's disease, and assessing the risk of air pollution to human health. In the future, the two universities will continue to give substantive attention to SDGs research and international community outreach in medical fields, including applications of artificial intelligence, biomedical engineering, and translation medicine. López et al. (2019) asserted that HEIs could provide professional and cross-disciplinary contributions to solve real-world problems and achieve SDGs. The results from the current study parallel the earlier studies and add new insights, focusing on the value of the SDGs promotion and sharing through strategic alliance in Taiwan's higher education.

Implications and Recommendations

Higher education institutions are responsible for preparing future sustainability leaders and supporting the implementation of ambitious SDGs targets. This study showed that a strategic alliance between two universities could increase joint research and publications related to SDGs and implement projects that promote SDGs. It also fulfills the partnership goals proposed in SDG17. Overall, the strategic alliance provides a solid basis for achieving all the SDGs and makes an essential contribution to forming a society willing to support critical SDGs (e.g., global citizenship, gender equality, and respect for human rights). Despite their crucial role in social transformation, higher education institutions must grapple with several internal (e.g., curricula, ethical principles) and external (e.g., different types of audiences, political environment, stakeholders' interest) challenges and barriers.

Further, the study's results are mainly descriptive; hence, future studies may focus on qualitative approaches for a richer and clearer framework. Likewise, this is one of the first preliminary studies of strategic alliances, focusing on the alliance between two universities in Kaohsiung. Therefore, more studies can be done in the future to check the framework's validity for more institutions, including both public and private universities, from all areas of Taiwan. Success in achieving the SDGs will depend on action and collaboration by all actors. Therefore, we recommend that universities continue to form strategic alliances to initiate and facilitate cross-sectoral dialogue and action on SDG implementation, as well as play an essential role in policy development and advocacy for sustainable development. Higher education has a vital role in meeting the sustainable development challenges of our times, and it can do much more than offer advanced training and skills. Through strategic alliances that magnify their strengths, they have the potential to educate excellent teachers and other practitioners, conduct ground-breaking research and connect services to communities. Governments, multilateral agencies, and universities must work together to promote a sustainable development agenda by targeting publicly funded research and building cooperative partnerships across sectors.

Concluding Remarks

Through their extended research capabilities and activities, universities in strategic alliances play critical roles in providing the necessary knowledge, evidence-based solutions, and innovations to support achieving SDG goals. Strategic alliances have enabled universities to integrate multiple SDGs-related courses and collaborative projects to give students opportunities to reflect on issues related to SDGs and join networks set up to implement SDG programs. Besides helping to achieve SDGs through collaborative research, universities in strategic alliances can coordinate relevant research at individual sites and advocate for national support. They can also strengthen intra- and interdisciplinary research community efforts across campuses to support the SDGs and, in this way, have significant impacts on social, cultural, and environmentally sustainable development within their campuses, communities, nations, and, ultimately, the planet.

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Appendix – List of 17 Sustainable Development Goals (SDGs)

The 17 sustainable development goals (SDGs) to transform our world:

GOAL 1: No Poverty

GOAL 2: Zero Hunger

GOAL 3: Good Health and Well-being

GOAL 4: Quality Education

GOAL 5: Gender Equality

GOAL 6: Clean Water and Sanitation

GOAL 7: Affordable and Clean Energy

GOAL 8: Decent Work and Economic Growth

GOAL 9: Industry, Innovation and Infrastructure

GOAL 10: Reduced Inequality

GOAL 11: Sustainable Cities and Communities

GOAL 12: Responsible Consumption and Production

GOAL 13: Climate Action

GOAL 14: Life Below Water

GOAL 15: Life on Land

GOAL 16: Peace and Justice Strong Institutions

GOAL 17: Partnerships to achieve the Goal

Exploring the Inner Characteristics and External Competency of Excellent Teacher: The Case of a University of Technology in Taiwan

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ABSTRACT

Institutional research in Taiwan has focused on student performance even though teachers and students influence student performance. Highly accomplished teaching, including teachers' innovative and digital teaching, can improve student performance. Consequently, it becomes crucial for the school administrative office to devote more effort to topics related to teacher performance. This study explores inner characteristics and external competence and predicts a promotion model of excellent teaching. The inner characteristics (teaching beliefs and values), external competency (creativity and information technology (I.T.), and background variables (gender, age, field, teaching experience, and title) of excellent teachers were explored to predict the teacher promotion type. Fifty-nine excellent teachers in the case university during the ten years participated in the questionnaire survey from April 12 to May 11, 2021. General statistics, correlation analysis, chi-squared test, and C5 decision tree models were carried out in this research. The results showed that the highest frequency of teaching beliefs belonged to enablers, implying that high sensitivity and inclusion are the principal teaching beliefs. Most excellent teachers have also focused on environment-centered teaching values. Creativity and I.T. were significantly positively correlated, but I.T. competency was negatively correlated with teaching experience. Furthermore, the field, teaching values, and teaching experience significantly influenced the promotion type of excellent teachers. The study outcome helps novice teachers' education by increasing the passing rate of adaptive promotion and assisting the management of other universities when they face similar situations in allocating administrative resources.

Keywords: Excellent teacher, Creativity, Information technology competency, Teacher promotion, Teaching beliefs, Teaching values

Introduction

Since 2015, institutional research (I.R.) has been promoted to conduct evidence-based research related to students, staff, and finances to advance sustainability and performance initiatives across institutions in Taiwan. Data availability and accuracy are vital in administrative and academic decision-making to enhance institutional effectiveness and accountability. In early studies, most issues were focused on students' performance and finance in Taiwan (Cheng et al., 2020; Hou et al., 2021; Lin et al., 2019; Lin & Borden, 2016; Moslehpour et al., 2020; Wang, 2017). Few studies discussed faculty outcomes in higher education (Cheng et al., 2020; Ho et al., 2017; Huang, 2018). Teachers and learners are the two main focus areas at higher education schools. Therefore, administrative offices need to devote more effort not only to students but to teachers as well. The more institutional resources for the teacher, the higher the productivity can be created in the universities. Most schools in Taiwan plan annual awards and budgets for excellent teachers to encourage excellent teaching. It is worth supporting these initiatives because highly accomplished teaching can raise student performance and satisfaction (Bond et al., 2000; Chen, 2007; Geier, 2021), resulting in a win-win environment between educational institutions and learners.

In retaining teachers' persistence and enthusiasm, there are four channels (M.O.E., 2016) that the instructors can promote during the teaching periods in Taiwan: (1) academic research, (2) industry-university cooperation, (3) teaching practice, and (4) art or sport. Although most teachers applied and passed the research promotion in the university case, the highest cluster of teachers was involved in teaching (Cheng et al. 2020). Furthermore, 11 instructors passed teaching promotions in the case school from 2011 to 2020. It is worth mentioning that all instructors are excellent teachers. The required qualifications of excellent teachers in the case of the university include teaching experience (more than three years), the average teaching evaluation scores from students' feedback are higher than 4.5 (highest is 5), practical/good teaching materials or pedagogies, and consulting students sincerely. After collecting the 11 teachers' outcomes, some significant factors influence their success in teaching promotion, including curriculum improvement portfolios, industrial teachers' cooperation, teachers' or students' competition awards, guiding students' certification records, professional publications, or teaching practical research projects.

Regarding outstanding teachers, the other requirements include innovative teaching methods, school award records, and so on (N.Y.U. Center for the Advancement of Teaching, New York University, 2009). The award-winning teacher group at the school was able to facilitate the development of professional cooperation and teaching innovation within the school and to transform it into a learning community (Lee, 2015; Lee & Li, 2015). Since the innovative teaching or digital teaching materials budget for the encouragement of excellent teachers was initiated, the administrative manager was keen to understand who had the potential to acquire resources and what the advanced plan was to encourage more excellent teachers to pass the adaptive promotion in the future.

Some researchers have argued that good personal characteristics affect outstanding teachers' success and qualities (Al-Busaidi et al., 2016; Liu et al., 2016; Park & Lee, 2006). Related to excellent teachers' potential characteristics, some scholars have reported the following as beneficial factors: inner personalities such as teaching beliefs, accessibility and approachability, fairness, open-mindedness, enthusiasm, humor and knowledge, inspiration imparted, empathy and sympathy, good moral character, clarity, and values (Axelrod, 2008; Cheng et al., 2009; Giorgi & Roberts, 2012; Qureshi, 2015). The five important teaching values are students, content, environment, teachers, and groups (The National Board for Professional Teaching Standards (N.B.P.T.S.), 1989; Heimlich & Norland, 1994). In addition, self-awareness is essential in becoming an outstanding teacher by exploring teaching beliefs, values, and attitudes (Galbraith & Jones, 2008).

Additionally, it is necessary to have external competencies such as lecture delivery, ability to organize lectures, classroom and behavior management, teaching methodology, knowledge of the subject, instructor-group interaction, instructor-individual student interaction, reflective practice, innovation, curriculum design, teaching services to the community, research into discipline-specific teaching, pedagogical research, and professional development (Chen, 2007; Qureshi, 2015; de la Rosa, 2007; Vallance, 2003; Witcher et al., 2001). Notably, many scholars emphasized skills that competent teachers should possess, including digital literacy and technology integration (Ertmer et al., 2007; Güneş & Bahçivan, 2018; Şimşek & Yazar, 2016; Voogt & Roblin, 2012).

Taiwan's M.O.E. started to promote the Teaching Practice Research Program in 2018 to improve the quality of teaching through innovative pedagogies to solve real problems in classes or use technology to improve university students' learning outcomes. Therefore, the external competencies between innovation and information technology (I.T.) are two important items for discussion in this study. In addition, the odds rate of promotion in the university case was only .35 till 2020 (Cheng et al., 2020). From the basic statistics of the excellent teachers' promotion, the odds rates are .63 in our records. Therefore, the paths of excellent teachers' promotion are worthy of exploration to predict their rules through different background variables. These measures will enhance the stability of their retention in universities with more resources, salaries, reputation, and self-awareness.

The research structure is shown in Figure 1. The study aims to:

(1) Explore the inner characteristics of excellent teachers.

(2) Explore the external competency of excellent teachers.

(3) Predict the promotion model of excellent teachers.

The study's outcome may be fundamental in establishing a raw model of outstanding teachers for novice teachers' education and help the management of other universities that face similar situations with administrative support.

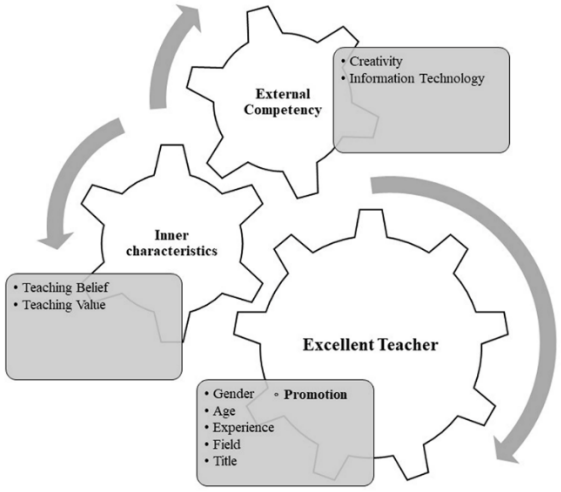

Figure 1: Research Structure

Literature review

Teaching Beliefs Scale

Teaching beliefs may be the foundation of the personal vision or philosophy of teaching. Understanding the teaching beliefs of excellent teachers can allow novice teachers to emulate outstanding benchmarks (Giorgi & Roberts, 2012) and affect students' achievement (Clark & Peterson, 1986). Some researchers have stated that teachers' beliefs are effective in their decision and behaviors in educational teaching (Bahcivan et al., 2019; Bahcivan & Cobern, 2016; Fives & Buehl, 2012; Yuan, 2017). As described, Heimlich (1990) stated that teachers' thoughts or actions associated with two dimensions (inclusion and sensitivity) change the focus from the teacher to learner (inclusion) and from content to process (sensitivity). Sensitivity refers to the teacher's ability to understand the learners' needs, while inclusion refers to the amount of control the learners have during their learning process in the instructor's classroom. The results of the teaching beliefs scale will cluster four types of teachers (expert, facilitator, provider, or enabler) concerning sensitivity and inclusion. The teaching belief scale from Heimlich and Norland (1994) was used in this study to understand the sensitivity and inclusion of excellent teachers, in this case, university, to explore their inner characteristics.

Teaching Values Scale

Heimlichand and Norland (1994) designed a teaching value scale for educators seeking to improve as teachers. It was indicated that understanding the self is understanding teaching values. Additionally, a sense of direction helped us decide what is important and provided us with an ethical and moral foundation' (Apps, 1996). There are five centers in this scale, including the teaching content/curriculum, the teaching environment/resources, the needs of a teacher/methods, the nature of the group of learners, and the nature of the individuals. It was ranked according to

the highest centered value after the evaluation. In addition, some scholars have focused on how the teaching value can be changed by different strategies and challenges (Moriates & Shah, 2014; Shah et al., 2015). Therefore, this study used the teaching values scale from Heimlich and Norland (1994) to explore the rank of five items from excellent teachers. Furthermore, it could be the reference model for novice teachers to learn and train in the pre-teacher program.

Creative Teaching

Innovative pedagogy can raise learners' learning interest, learning performance, and student satisfaction (Grainger et al., 2004; Hong, 2002; Huang et al., 2015;). In addition, creative teaching refers to unique and unconventional methods that improve or enhance the original activity (such as flipping classroom teaching and creative thinking pedagogy) in unison with information technology by participating in international competitions (Cheng, 2018). Horng et al. (2005) stated that personality traits, family factors, motivations, and the organizational environment are four important factors that influence creative teaching. Other researchers listed the most predictive of creative teaching of instructors in universities as being personality traits, motivation teaching, content knowledge, shared value, divergent thinking, and school culture (Amabile, 1988; Sternberg & Lubart, 1993; Wu & Liao, 2007). Due to the high reliability (mean of all Cronbach's α=.86) in the six functional creative teaching scales from Wu and Liao (2007), this study explored the scores of creative teaching from excellent teachers at the university.

Information Technology Literacy

In addition to creative teaching, more digital competence supported by information technology could enhance students' learning effectiveness (Lim et al., 2015) and instructors' teaching, communication, and content innovation (Garzón Artacho et al., 2020; Mirete et al., 2020; Vorobets, 2019). Coklar and Odabasi (2009) developed the educational technology standards scale to evaluate teachers' educational technology ability. There are six teachers' educational technology assessment standards: 1. Technology operations and concepts; 2. Planning and designing learning environments and experiences; 3. Teaching, learning, and curriculum; 4. Assessment and evaluation; 5. Productivity and professional practice; and 6. Social, ethical, legal, and human issues. In this research, excellent teachers have taught in real situations for more than three years. Therefore, the productivity and professional practice scale (Cronbach's α=0.919) from Coklar and Odabasi (2009) was adopted to explore the external outcomes of information and technology competency.

Decision Tree C5 and influencing factors

A decision tree is a part of data mining methods. Its goal is to predict the value of a user-specified output attribute based on the values of other attributes, known as the predicting attributes. C5 is an algorithm used to generate a decision tree developed by Quinlan (2017). C5 decision trees are created from various features, and then the tree is classified using a subsequent set to build the model. In addition, the C5 algorithm can extract valuable patterns and improve features

(Khanbabaei et al., 2019; Khraisat et al., 2020; Razi & Shahabi, 2016; Zare et al., 2019). The present study applied a C5 decision tree to explore the case of university's promotion rules among excellent teachers.

Several studies have identified the factors influencing teachers' performance and promotion, including background variables such as gender, age, experience, field, and professional title (Cheng et al., 2020; Drake et al., 2019; Hameed et al., 2015; Mayesthi et al., 2021; Li et al., 2016; Odebode, 2018; Wang et al., 2017). In this study, these background factors were included as independent variables, and the promotion of excellent teachers was the dependent variable. Through the C5 decision tree, the prediction of the promotion model of excellent teachers could be explored for the manager to make related decisions through this institution's research.

Methodology

Samples and Procedure

In the present study, data were collected from the academic affairs office. All the data were identified, and there were no ethical problems. One hundred excellent teachers in the case university in the academic year from 2011-2020 were invited to answer four questionnaire scales online from April 12 to May 11, 2021. A total of 59 participants completed this survey. The four scales include the teaching beliefs scale, teaching values scale, creative teaching scale, and educational technology standards scale. The researchers added a declaration at the beginning of the survey stating that academic institutions will only use it with their names kept anonymous and not for business purposes. In addition, these questionnaires were related to the evaluation of teaching pedagogies. Therefore, the ethical procedure was followed and matched the regulations of exemption from the I.R.B. review in Taiwan's Ministry of Health and Welfare (2012).

Measures and Variables

Basic statistics were carried out to understand the composition structure of excellent teachers at the university. The background variables were gender (male, female), age (thirty:30-39, forty:40-49, fifty:50-59, sixty:60 or above), experience (ten:4-10, twenty:11-20, thirty:21-30, forty:31-40 years), field (management, science and engineering, design, humanities and social sciences, informatics), and professional title (lecturer, assistant professor, associate professor, professor) of excellent teachers. The type of promotion from excellent teachers was coded into four clusters (research, teaching, skill, and no promotion).

The teaching beliefs scale has 22 items related to two dimensions: sensitivity and inclusion (Heimlich, 1990). Heimlich (1990) defined three levels for each score: low (0–6.0), neutral (6.0 – 8.0), and high (8.0 – 11) to label the respondents' Teacher Belief Scale type. After numeric scores were plotted on a grid with defined quadrants, the types of teaching beliefs could be explored.

Combining these two dimensions categorizes teachers into four groups: 1. experts have low sensitivity and low inclusion, 2. facilitators have low sensitivity and high inclusion, 3. providers have high sensitivity and low inclusion, and 4. enablers have high sensitivity and high inclusion.

There are 10 items in the teaching value scale to count five centers (content, environment, teacher, group, and student). From the average scores of ten items, the center could be ranked from the first to the last and explored, which was focused on by the excellent teacher.

There are 26 items in the creative teaching scale, including six domains: personality traits, motivation teaching, content knowledge, shared value, divergent thinking, and school culture. The scale is the same as the five-point Likert scale. The options were "strongly agree," "agree," "neutral," "disagree," and "strongly disagree." The scoring order was 5, 4, 3, 2, and 1 point, respectively. The higher the score, the more creativity the excellent teacher was with literacy.

There are 10 items on the educational technology standard scale. Excellent teachers' productivity and professional practice could be explored using a five-point Likert scale to understand their information technology competency. The higher the score, the more I.T. competency the excellent teacher had. To classify the level of the scores, the frequencies of three levels (coded: high > 4.5, middle = 4.0.-4.5, and low < 4.0) were also counted according to the average scores between creative teaching and educational technology standard scales.

Since the scores of the external scales were both five points, a correlation analysis was carried out to understand their effect. In addition, all background variables were analyzed using a cross table with internal and external characteristics. Through ANOVA, a significant difference between categorical and continuous variables could also be detected.

Finally, based on C5 cluster rules, the prediction model of promotion from excellent teachers in the case university was explored. The independent variables were background factors (gender, age, experience, field, and professional title of excellent teachers), teaching belief types (expert, facilitator, provider, or enabler), teaching value types (content, environment, teacher, group, student), creativity, and I.T. levels (high, middle, low). The dependent variable was the promotion type (research, teaching, skill, and no promotion). The results ensure the allocation of the resources concerning different backgrounds and internal and external clusters and see the weight of factors.

Results

Basic statistics

Table 1 shows the frequency counts, including six background variables, internal characteristics (teaching belief and teaching value), and external competency (creativity, information technology). Excellent teachers are the most common group in the field of management. There are more males (32) than females (27). Associate and assistant professors were the main groups. Most of them were between 40 and 59, and teaching experience is mainly in the 11-20 years range. Research is the highest rate of promotion for excellent teachers.

The enablers' frequency counts were the most related to teaching beliefs. High sensitivity and inclusion are the primary excellent teachers' teaching beliefs. Regarding teaching value, most excellent teachers were focused on being environment-centered (E) (mean=3.95). Since the average among the six domains of creativity (personality trait, motivation teaching, content knowledge, shared value, divergent thinking, and school culture) and I.T. competency (productivity and professional practice) are both 4.3 and high in Table 2, between 4.0 and 4.5 was coded as the middle level. The high level is the highest between creativity and I.T. from excellent teachers.

Table 1: Frequency counts of excellent teachers

Item		Count
Field	Management	15
	Science & Engineering	11
	Design	6
	Humanities & Social Sciences	16
	Informatics	11
Gender	Male	32
	Female	27
Professional title	Lecturer	6
	Assistant professor	21
	Associate professor	22
	Professor	10
Age	Thirty	1
	Forty	29
	Fifty	21
	Sixty	8
Experience	Ten	5
	Twenty	35
	Thirty	19
Promotion	Research	26
	Skill	6
	Teaching	5
	Not yet	22
Teaching Belief	Enabler	48
	Expert	1
	Facilitator	4
	Provider	6
Teaching Value	Environment(E)	33
	Content(C)	8
	Teacher(T)	5
	Student(S)	4
	Group(G)	4
	C/S	2
	E/S	3
Creativity	High	26
	Middle	19
	Low	14
I.T.	High	27
	Middle	15
	Low	17

Table 2: basic statistics of creative teaching and information technology

Type	Min	Max	Mean	SD
Personality trait	2.14	5.00	4.32	.47628
Content knowledge	2.80	5.00	4.32	.55734
Divergent thinking	2.75	5.00	4.36	.58781
Shared value	2.50	5.00	4.29	.63959
School culture	2.00	5.00	4.21	.77425
Motivation teaching	2.50	5.00	4.48	.60475
Information technology	3.10	5.00	4.30	.56140

Table 2 shows that excellent teachers' motivation teaching is the highest item (mean=4.48) of creative teaching. School culture is the lowest item of the six domains; however, the average score is still higher than 4.2. In addition, the average I.T. competency of excellent teachers was 4.3 high. Both creativity and I.T. competency is good for the most excellent teachers, in this case, university.

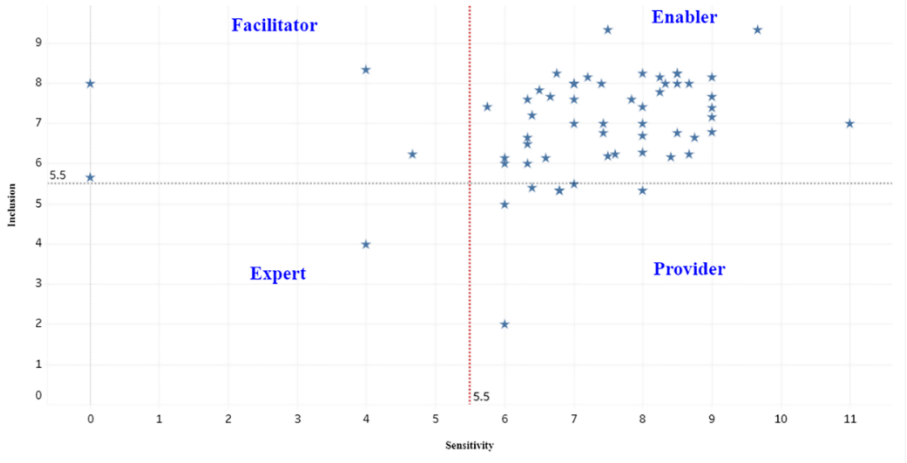

Figure 2: Teaching beliefs scale

Based on the star scores (Figure 2), the respondents fell into one of four types: enablers, providers, facilitators, and experts. It was found that of the participants, 81% (n = 48) were scored as "enabler," 10% (n = 6) were scored as "provider," 7% (n = 4) were scored as "facilitator," and 2% (n = 1) scored as an "expert." The mean calculated score for sensitivity was 7, and for inclusion, the score was 7. Most excellent teachers belong to the type of enabler (high sensitivity, high inclusion).

Correlation and Chi-squared test

Creativity and information technology are positively related (correlation coefficient=.698), as shown in Table 3. The better the creative teaching, the better the I.T. competency of excellent teachers.

Table 3: Pearson Correlations

		ACA	AIT
ACA	Pearson correlation	--	
	N	59	
A.I.T.	Pearson correlation	.698**	--
	significance （two-tailed）	<.001	
	N	59	59

Note: ** p-value is significantly smaller than 0.01

From the Chi-squared test in the cross table, the effect between the I.T. competency and teaching experience (Table 4) was significantly different (p-value<.05). The teaching experience below 20 years had higher levels of I.T. competency.

Table 4: Cross Table of Experience with I.T. levels

			I.T.			Total
			High	Middle	Low	
Experience	Ten	Count	3	2	0	5
		% within IT	11.1%	13.3%	0.0%	8.5%
	Twenty	Count	18	11	6	35
		% within IT	66.7%	73.3%	35.3%	59.3%
	Thirty	Count	6	11	2	19
		% within IT	22.2%	64.7%	13.3%	32.3%

C5 Decision Tree

There were six rules in the C5 decision tree model. The precision was 82%. Independent factors, including experience, teaching value, and field, influenced the promotion type of excellent teachers. Regarding promotion type, research was the main channel in the university case (.44). Also, concerning the teaching experience as a variable (20 and 30). 48 belonged to the research promotion. Furthermore, in the environment-centered fields of science and engineering, informatics, and management, the promotion rate with research was higher than .52.

The models were as follows (Figure 3):

(1) If the teaching experience is 6-10 years, then the promotion type is not yet. (Node1)

(2) If the teaching experience is higher than 10 years, the teaching value is group-centered, then the promotion type is research. (Node 2 & 3)

(3) If the teaching experience is higher than 10 years, the teaching value is content-centered or individual student-centered, then the promotion type is a skill or teaching. (Node 2 & 4)

(4) If the teaching experience is higher than 10 years, the teaching value is environment-centered, and the field is designed, then the promotion type is a skill. (Node 2 & 5 & 6)

(5) If the teaching experience is higher than 10 years, teaching value is environment-centered, and the field is science and engineering, informatics, or management, then the promotion type is research. (Node 2 & 5 & 7)

(6) If the teaching experience is higher than 10 years, the teaching value is environment-centered, and the field is humanities and social sciences, then the promotion type is not yet. (Node 2 & 5 & 8)

(7) If the teaching experience is higher than 10 years, the teaching value is teacher-centered, then the promotion type is not yet. (Node 2 & 9)

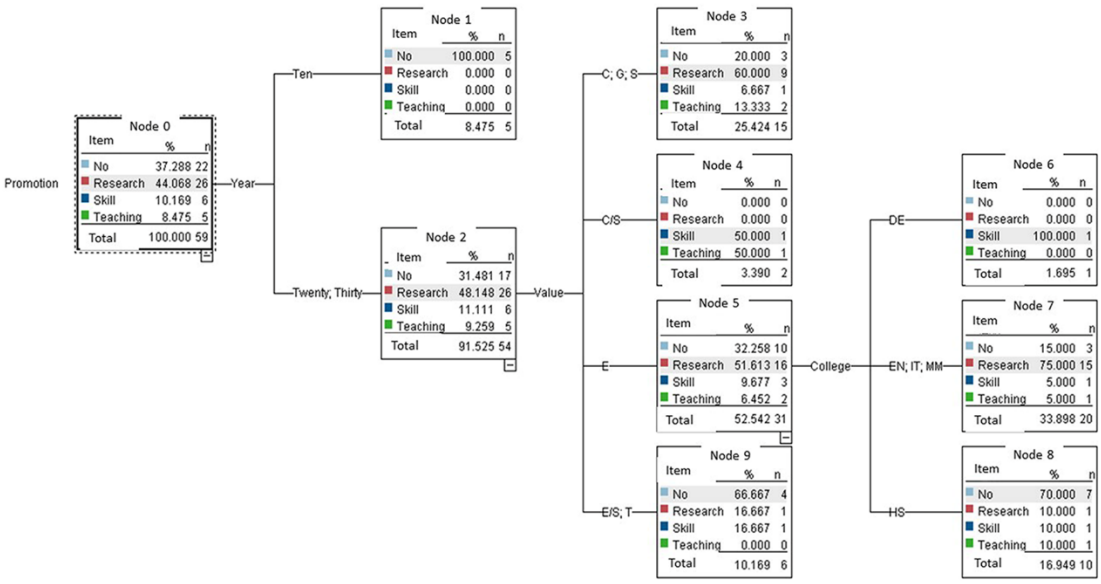

Figure 3. C5 decision tree

Discussion

This research served three purposes: (1) It explored the inner characteristics of excellent teachers; (2) it explored the external competency of excellent teachers; and (3) it predicted the promotion model of excellent teachers. Additionally, some related literature supported our findings, and the inner characteristics were divided into teaching beliefs and values.

Teaching Belief: Enabler

Based on the learner-centered teaching belief, we can infer that a fourth to a fifth of the excellent teachers in the university will demonstrate behaviors at a high level related to understanding and addressing the needs of their students. In this research, 81.4% of the excellent teachers were clustered into high sensitivity and inclusion. It meant that most of the excellent teachers in the case of the university were enablers. This result is consistent with previous academic results worldwide

(Cano et al., 1992; Giorgi & Roberts, 2012; Heimlich, 1990; *Ramchander, 2020;* Whittington & Raven, 1995). Most excellent teachers paid attention to the students' needs, and let the students think, design, discuss, group work, present, and practice with freedom during their learning process in the classroom. Therefore, there are many innovative pedagogies created by teachers to enhance learners' motivation and satisfaction, such as problem-based learning (Belland et al., 2020; Edens, 2000; Jones & Mendez, 2021), team-based learning (Cagliesi, & Ghanei, 2022; Choi et al., 2021; Michaelsen & Sweet, 2008), attention-relevance-confidence-satisfaction (ARCS) (Brieger et al., 2020; Keller, 2000; Sugahara & Dellaportas, 2018), Conceive-Design-Implement-Operate (C.D.I.O.) (Crawley et al., 2014; Hawse & Wood, 2019; Polenov et al., 2020), and so on. In the next step, it would be interesting to analyze and discuss the pedagogies most excellent teachers utilize.

Teaching Value: Environment (environment & equipment)

Regarding the teaching value, the results showed that most excellent teachers focused on the environment-centered, with a percentage was 0.56 (The rank was environment>Individual Student>Teacher>Group>Content). The result signifies that creating and improving the learning environment, effective academics, and facilitating learning for the learners' benefit is for educators to understand their preference toward a teaching style (Heimlich, 1990; Huntley-Moore & Panter, 2006; Kirupainayagam & Sutha, 2022). The results showed that creating a good environment is the accountability of individual teachers and includes administrative institutions' support, corresponding, and responsibilities. Some researchers have emphasized friendly classroom management and pleasant interaction situations in the learning environment (Maheux, 2001; Sueb et al., 2020). Therefore, some environment or equipment innovation pedagogies have been applied in class interactions globally, such as experiential learning or project learning (Amigó, & Lloyd, 2021; Murshidi, 2021; Tavangar, 2014); game learning (Barr, 2017; Khalid et al., 2020; Nadolny et al., 2017), service-learning (Hsiung, 2021; Sahatjian et al., 2022; Sykes et al., 2017), and so on.

Creativity & I.T.

In the analysis of correlation, creativity and I.T. were positively correlated. These results were consistent with other studies in different countries (Laval et al., 2021; Lee & Hong, 2016; Stolaki & Economides, 2018). However, I.T. competency is negatively related to teaching experience. Information technology knowledge and skills are updated daily; however, more experienced teachers may think that the traditional pedagogies are sufficient, show a decline in motivation to learn new skills (Torenbeek & Peters, 2017), or are afraid or have stress about accepting the new technology (Özgür, 2020). Concerning administrative support, the academic affairs office can plan and invite digital experts to train the teachers, especially in more detailed steps for the highly experienced teachers. Therefore, students in each class can learn about modern and practical I.T. competencies. In addition, regarding creativity with I.T., different tools in the e-market, such as Facebook, YouTube, Instagram, WebQuest, Zoom, Google Meet, Zuvio, Robot, V.R., AR, e-book, podcast, e-learning, simulation, A.I., E-portfolio, Big Data, Massive Open Online Course/MOOC,

I.O.T., 3D print, and so on have been developed, and innovative pedagogies between creativity and I.T. have also designed in the learning environment in higher education, such as the flipped classroom instructional model (He, 2020; Long et al., 2019; Zhu & Xie, 2018). No matter how many years of teaching experience, learning motivation creates win-win situations between students and instructors.

Predicting promotion model

From the prediction model of the C5 decision tree, three significant factors influence excellent teachers' promotion in the case of university. First, the promotion rate was .68 when the teaching experience was higher (over 10 years). Second, the teaching value is clustered into environment-centered teaching, with a value of .67 to pass the teachers' promotion. Third, if the field is science and engineering, informatics, or management, the promotion rate is .85. It is the same with some researchers' findings which focused on research performance (Cai, 2015; Wang et al.,2016). Contrarily, the less experienced, teacher-centered, and humanities and social sciences excellent teachers seemed not worthy of passing the promotion. Most excellent teachers applied for the research promotion; however, the field of design passed the skill promotion, and the fields of humanities and social sciences passed the teaching promotion more easily than the research channel. Since the Ministry of Education (M.O.E.) has opened multiple promotion channels for instructors in higher education in Taiwan (M.O.E., 2016), the innovative pedagogy has become more and more popular (Huang, 2020; Lu, 2020), and the strategy could benefit teachers in different fields to apply the teaching promotion in higher education. These results also confirm the importance of multiple promotions by previous researchers (Cheng et al., 2020; Ho, 2014; Mu & Hatch, 2021). The administrative manager could arrange different resources for each promotion channel; thus, the excellent teachers could satisfy the school's support and retain to serve at school with sustainability.

Implications

In traditional pedagogy, university teachers paid attention to self-teaching and regarded teacher-centered as normal. However, the excellent teachers were clustered into high sensitivity and inclusion in this study. The students-centered belief could be designed in the curriculum between teacher-developing programs and teaching training workshops. In Taiwan, most teachers in universities lack teacher development programs. Only primary and secondary education offers teachers programs such as Philosophy of Education, Educational Psychology, Sociology of Education, and Introduction to Special Education. The training between high sensitivity and high inclusion is necessary to learn from the curriculum of psychological counseling in higher education. Therefore, the administration managers could design basic educational workshops and invite related professors and experts to share their teaching beliefs and some meaningful case studies in the universities to improve the growth of enablers.

Most excellent teachers in the case of university belong to environment-centered teaching values. Therefore, profound equipment support or expert training with the latest innovations and information technology operations are necessary for logistics from the side of administration offices. Since managers offer sufficient resources, teachers can create attractive teaching materials for students or set up practical situations, such as intern field areas, to simulate vocational operations after graduation. From the spotlight of the learning environment, the enrollment rate of undergraduates could be improved by the reputation of alumni. In addition, international visits and exchanges also improved the excellent teachers' vision and world perspective. Administration offices could plan the budget for short-term visiting scholars to encourage excellent teachers to pursue their specific welfare and bonus.

In addition, the strategy of multiple promotion channels should be encouraged by excellent teachers. Through teaching, skill, or research experience sharing, teachers' evaluation indicators might be modified according to different fields. Since excellent teachers in science and engineering, informatics, and management fields are easier to publish in Scopus journals in the case of a university, their evaluation indicator in research could be higher in the total weight of teachers' assessment. As excellent teachers are in design, skill performance should be represented in journal items such as skill reports, inventive patents, or works exhibitions. Finally, since excellent teachers belong to the humanities and social sciences fields, the performance indicator could be more focused on teaching. Thus, the foundation indicators are the teaching experience, students' satisfaction scores, and creative teaching materials or pedagogies.

Recommendations

Currently, university social responsibility (U.S.R.), service learning, technical implementation, English as a Medium of Instruction (E.M.I.), and sustainable development goals (S.D.G.) in universities are the latest trends in teaching and learning. Since the teachers paid more attention to developing mature characteristics and nutrient undergraduates' competency through humanities and social sciences, the educational outcome is necessary to spend a long time and be checked by the other indicators such as career interest or competency development.

There are many research methodologies in the educational area, such as quality and quantity research. The questionnaire analyses demonstrated excellent teachers' initial direction and phenomenon in this study. However, detailed preparation, process management, organization, and modification of teaching skills or pedagogies are necessary to collect through In-depth interviews in the future. Therefore, more precise and specific factors could be explored depending on the different promotion channels.

Conclusions

This study explored the potential characteristics of excellent teachers between teaching beliefs and teaching values. In the case of the university, most excellent teachers are highly sensitive and

inclusive. Regarding teaching values, the environment-centered is the top one. Therefore, related administrative support could be arranged, and the weight of teaching resources could be modified in the institutional planning according to the result. In addition, creative teaching using information technology is positive; hence, excellent teachers who have taught for more than 20 years are encouraged to advance their I.T. competency to offer the latest pedagogies for each student.

Moreover, the field, teaching value, and teaching experience were significant factors that influenced excellent teachers' promotion type. Regarding the promotion percentage of excellent teachers, there are still .37 hidden values (22 of them not yet applied). In future research, excellent teachers can be observed for longer periods to develop more precise models. The study's outcome may be helpful for novice teachers' education and help the management of other universities that face similar situations in their allocation of administrative resources.

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Powering HEI Survey System for Data Analytics

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Abstract

It is a common practice for all HEIs to develop satisfaction perception studies to report the degree of expectations and satisfaction of the HEIs' teaching & learning and administrative & services supports, facilities, learning resources & infrastructures systems. These surveys are designed to meet the quality assurance & accreditation requirements, albeit designed independently by each academic & administrative unit to meet their specific and unique needs. This approach inadvertently provides information specific to a program, course, or unit that potentially is not aligned with the higher levels SMART objectives or provides internal benchmarking for informed decisions on overall and comparative performance. While this has been the practice & norm in surveys, this paper proposes an alternative 5-levels dive-down approach to powering the HEI survey systems for HEI performance analytics. The surveys provide performance metrics for Institutions, Colleges & Programs' (ICP) IQA & Accreditation, Strategic and Operational Planning & management systems. This paper illustrates an HEI case of its six primary surveys, Course Satisfaction (CSS), Student Experience (SES), Faculty & Staff Satisfaction (FSS & SSS), Alumni Satisfaction (ASS), and Employment Market Satisfaction (EMS) Surveys. These surveys can be consolidated to report on 16 KPIs of the 50 IQA KPIs. The KPIs are expanded by construing some generic constructs common across the surveys, processing and extracting their data analytics (DA) independently. This processing is, in addition to other requirements specific to the survey instrument objective, driven by the ICPs' mission, goals, values & SMART Objectives aspirations. The case study illustrated KPI 1.1. Stakeholders' awareness ratings of the Mission Statement and Objectives example are extracted from 3 surveys of SES, FSS & SSS Surveys to provide three sub-sets of KPIs for three stakeholder groups: Students, Faculty, and Staff. The six primary surveys construct measures are construed generically for data analytics delivering ICP and individual performance analytics insights.

Keywords: HEI Survey systems, HEI Data analytics, performance analytics

Introduction

Other than companies' customers, students are perhaps among the most surveyed worldwide. From the Western to the Eastern hemisphere HEIs, the use of student satisfaction surveys, with its origin in student evaluations of course teaching (Ramsden 1991), is an established long tradition in all higher education systems. These have gradually been extended to include student perceptions of the quality of institutional governance & administrations and quality assurance of conditions supporting teaching and learning, such as libraries, student support services, etc., as student feedback to HEI decision-makers. Harvey (2003) defines "feedback" as the "expressed opinions of students about the service they receive as students". This definition includes "perceptions about the learning and teaching, the learning support facilities (such as libraries, computing facilities), the learning environment (lecture rooms, laboratories, social space, and university buildings), support facilities (cafeterias, student accommodation, health facilities, student services) and external aspects of being a student (such as finance, transport infrastructure)". The levels of analysis have also extended from institution-level satisfaction surveys of the entire study experience to individual courses, modules, and study programs.

In today's educational system, most HEIs incorporate feedback to meet IQA (Internal Quality Assurance) & Accreditation, Governmental governing units, and students' & stakeholders' requirements. This feedback is customarily collected at Institutions, Colleges, or Programs (ICP) levels via perception & evaluation surveys. The feedback is used to improve or innovate course teaching & learning, academic & administrative services & supports, facilities & infrastructure, governance, management & societal responsibilities. The student experience is a central tenet of quality assurance and accreditation in higher education. In some HEIs, especially as a requirement for accreditation or norms and practices of Western Education as opposed to the Eastern World Education philosophies and practices, the attention has highlighted the move from student experience to student engagement. The western approach considers students as active partners in the educational process and responsible for their learning and formation (Klemenčič, 2013 & 2015).

These ensure adherence to the ICP-aligned mission, goals, values & SMART Objectives (AlKhatnai and Teay, 2022). As Shah & Nair (2012) noted, the quality assurance and performance-based strive by ICP using the various perception of satisfaction surveys as measures of educational quality can result in increased use of students' & stakeholders' voices. These are used to assess learning and teaching and all educational value-creating & delivery mechanisms & systems outcomes. The Students' and stakeholders' satisfaction and experience surveys have been acclaimed to be a driver of institutional reforms in students' & stakeholders' experience bringing about improvements & innovations (Richardson 2013) and institutional performance (Klemenčič et al. 2015; Kim and Lalancette 2013; McCormick et al. 2013). The performance strives to develop student & stakeholders' evaluation quality culture that enhances feedback and improvement through survey systems in ICPs (Tucker, 2013).

For IQA & Accreditation requirements, student surveys are one of the largest and most frequently used data sources for quality assessment in higher education (Williams 2014). Student survey data supposedly feed into evidence-based ICP's data-driven informed decision-making and are part of the tasks of institutional research. IQA or institutional researchers are requested by HEI

management to create and deliver more and better "intelligence" of the students' experiences and performances (Klemenčič and Brennan 2013; Klemenčič et al. 2015). Much of these data are typically acquired through student, Faculty & staff, and alumni & employment market surveys. Radwin (2009) noted that "…the use of surveys is one of the fastest-growing and most pervasive trends on ICPs". With the advancement of technology and AI (Gardner and Davis 2013), collecting, processing, and providing data and performance analytics from stakeholders is becoming cheaper, faster, and easier to process.

Challenges in HEI Surveys

Tucker's (2014) research in a semester in 2010 from an Australian university noted that student comments provide valuable insights into their experiences. Comments were categorized as either abusive or unprofessional and by the intended target (that is, teacher, unit, resource). 13 of 30,684 observations from 17,855 surveys, 0.04 % of the sample demonstrated abusive comments, with five offensive comments directed at the teacher and eight at teaching and learning experiences. Another 0.15 % of the sample comments were identified as unprofessional. Seven comments were directed at the teacher, and 34 were about units. Tucker's 2014 research suggests that the vast majority of students do not abuse the privilege of giving anonymous feedback and potentially highlights the potential benefits or surprises (Chen & Chen, 2010) of surveys if construed and used appropriately (Lewis, 2001; March 2007; Oliver et al., 2007). Jones et al.'s (2014) research explores relevant legal issues like defamation, breaches of (1) taking reasonable care for an employee's welfare, (2) duty of trust and confidence, breach of the right to privacy, (3) punishing or forcing staff to resign as a consequence of such infringements, non-constructive dismissal and (4) publication of survey results or use to inform employment & development decisions of decision-makers. It includes inherent risks of abuse, indifferent or hostile revengeful attitudes & negatively construed perceptions (Jones et al., 2014). It is resonated by Shah & Nair's (2012) paper on the shift from voluntary to mandatory use of surveys with the results used to assess and reward academic staff performance driven by the introduction of performance-based funding as part of quality assurance arrangements. It highlights potential risks in the construct measures design & development and the translation of the evaluation into positive actions (Hirschberg et al., 2011; Hodges & Stanton, 2007; Alhija & Fresko, 2009). Arthur's semi-structured interviews of academics' use & interpretation of evaluations suggest that the process is complex and is influenced by lecturers' perceptions, beliefs, and feelings. They are linked to concepts of performativity and professionalism with four possible reactions: shame, blame, tame (the students), and reframe (the negative as something positive). It inherently means that the design & development, collation & processing, and synthesizing & analysis of performance data analytics practices should be construed within the context of institutional research.

The widespread and increased use of students' & stakeholders' survey data raises questions about the reliability and validity of the survey data as evidence in decision-making. Its proliferation potentially affects the design & development of the constructs measures and multifarious and highly diverse survey instruments intents. The instrument's validity, as defined by OECD (2013), concerns "whether the surveys measure what they are designed to measure and to provide evidence that supports inferences about the characteristics of individuals being tested" (Porter, 2011). Reliability concerns (Alderman et al., 2012) whether surveys "provide stable and consistent results over repeated measures allowing for results to be replicable across different testing situations". In

addition, significant areas of contention areas of perception surveys include (1) student self-reported information accuracy, respondents' understanding and interpretation consistency of the questions (McCormick and McClenney 2012; Pike 2013), (2) the selection of the standards of educational practice and student behavior implied in the questions (Campbell and Cabrera 2011; Gordon et al. 2008; Porter 2013; Porter et al. 2011), (3) researchers observational biases in just focusing on "issues or areas where they think they will find positive results, or where it is easy to record observations", in so-called 'streetlight effect' coined by Friedman (2010), (4) low response rate, student survey methodology and attempts to find better ways to increase response rates (Porter 2004; Porter and Whitcomb 2004; Porter et al. 2004), and (5) use as survey benchmarks designed to "represent clusters of good educational practices and to provide a starting point for examining specific aspects of student engagement" (Ewell et al. 2011; Kuh 2001; McCormick and McClenney 2012; Pike 2013).

In addition, the process by which the surveys are launched, their timing, and their methodology are critical factors that potentially affect the surveys' intended aims (Abbott et al., 1990). Abbott et al.'s research found that students were more satisfied with interview methods at midterm followed by extended instructor reaction than with traditional approaches for collecting student opinions about instruction (i.e., standardized rating forms administered at the end of a course). It is consistent with reactance and social comparison theories. It is also supported by Alderman et al.'s (2012) findings that while student feedback is valued and used by all Australian universities, some survey practices are idiosyncratic. In most cases, questionnaires lack validity and reliability; data are used inadequately or inappropriately, offering limited potential for cross-sector benchmarking. In addition, their study confirms the need for HEIs to develop an overarching framework for accurate, reliable, multidimensional, and helpful student feedback survey evaluation, technically pursuing sound evaluation practices in the interest of local, national, and international stakeholders. It also shows the increased focus on outcomes and less on resources needed to generate learning, teaching, and research quality. It also relies more on student happiness as a measure of educational quality. It raises the question of whether high student satisfaction would strengthen academic rigor and student attainment of learning outcomes and generic skills that are seen as critical factors in graduate exit standards.

Potentials of data and performance analytics in higher education

Our everyday life consists of episodes of data analysis whereby we make decisions or take actions by thinking, albeit critically and analytically, about what happened last time or what will happen when choosing a particular decision. This data analysis process involves data collection, manipulation, and examination to gain deep insight. On the other hand, data analytics is taking the analyzed data and working on it in a meaningful and helpful way to make well-versed business decisions through human intellects to convert to information and potentially wisdom. DA is important because it helps businesses optimize performance (Campbell and Oblinger, 2007; Wong, 2016). Data Analytics (DA) is nothing but synthesizing and analyzing our past or future actions and making decisions based on them. DA is nothing new in the business world. Some key benefits of data and analytics for positive business strives and ventures include (1) Proactivity & Anticipating the needs of the customer through "customer's voice" and (2) Mitigating risk & fraud through data crunching and depicting scenarios, including cost management (Daniel, 2015; Chaurasia et al., 2018). (3) Delivering relevant products through a better understanding of

customers' inherent needs and requirements, (4) Personalisation & Service through customization and tailoring to meet and excel in customers' expectations, (5) Optimizing & Improving the Customer Experience through learning and sharing across organizational units of the customer as "king".

In the HEIs, four types of data can be used as HEIs success and progress indicators achievement data, demographic data, program data, and perception data, namely the surveys. In the HEI environment, analytics are used to analyze various collected data points to provide insights and make informed decisions about complex education & stakeholders issues (Campbell and Oblinger, 2007). Higher Education DA offers exceptional opportunities to investigate, understand, and model academic and pedagogical processes. It is done through (1) Learning Analytics (LA), which targets levels of educational stakeholders of the micro (Learner) and macro (Faculty), whereas (2) Academic Analytics (AA) benefits the stakeholders at the macro (Institution) and mega (Governance) hierarchy levels (Siemens and Long, 2011; Ifenthaler, 2015). It includes Educational Data Mining (EDM) (Peña-Ayala, 2014), where the output of one may become the input of another (Nguyen et al., 2020; Chatti et al., 2014; Dahlstrom, Brooks and Bichsel, 2014). These address business intelligence and academic & learning analytics changes brought about by global and rapid social changes (Daniel, 2015; Nguyen, Gardner, & Sheridan, 2017). It also addresses performance issues (Daniel, 2015; Nistor and Hernández-Garcíac, 2018) and discovers relationships between student behaviors and contextual factors in the learning environment (Baker and Inventado, 2014). DA in education provides feedback to ICP administrators and can enhance academic & administrative decision-making and organizational resource allocation. These changes and challenges heightened the need for well-established HE data management and analytics in the learning and teaching environment (Siemens and Long, 2011; Greller and Drachsler, 2012; Nguyen, Gardner, and Sheridan, 2017). These education data include academic, educator, demographic, and student information collected from many sources and formats, although the type of data and who can access it varies. Access to robust data empowers people with the information they need to make decisions (Pistilli et al., 2012; Chaurasia et al., 2018). They play an essential role in identifying the resource needs of schools, monitoring standards, and recommending improvement measures. Implementing DA into the HEI business model help reduce costs & improve productivity. It helps identify more efficient ways of doing "academic business in creating & delivering on education value" and storing large amounts of data, analyzing various collected data points to gain insight and make informed decisions about complex issues. Specific areas include academic analytics, business intelligence, and learning analytics. When data is collected efficiently, securely, and ethically by ICPs, it can be used to provide insight on where to invest, allocate & optimize time, money, and resources by (1) evaluating the use of campus buildings, services, facilities, and resources by the stakeholders, (2) monitoring and assessing classes and programs performances by compelling data use to measure student progress, (3) evaluate program & instructional effectiveness, guide curriculum development & resource allocation, promote accountability and, most importantly,(4) safeguard students' learning and success (Pistilli et al., 2012; Dahlstrom et al., 2014; Chaurasia et al., 2018).

DA can be used to support the Faculty to benefit from (1) targeted course offerings through curriculum development, (2) determining and evaluating student learning outcomes and behavior to provide customized & personalized learning, (3) improved faculty performance through students' feedback, and (4) enhanced post-educational employment opportunities and improved

research in the field of education. Educational Data-driven decision-making can transform classroom teaching & learning by improving teacher responsiveness to students, ensuring relevant instruction & pedagogy, and making Faculty more productive. Using DA, the Faculty can better trace and take targeted actions to improve the student learning process & outcomes through personalization and customization (Greller and Drachsler, 2012; Kerr, 2016) via early intervention solutions (Arnold and Pistilli, 2012). Interpreting data allow Faculty to identify the strengths and weaknesses of an entire class or individual students, despite their performance. DA plays a vital role in identifying & addressing education inequalities. Through DA examination, Faculty can identify & develop hypotheses about factors that affect students' learning and ways to improve instruction & pedagogies to assist students' achievements based on their social, cultural & economic backgrounds (Peña-Ayala, 2014; Bharara et al., 2018). DA can provide a snapshot of what students know, what they should know, and what can be done to meet their academic needs and developments. With appropriate DA analysis and interpretation, Faculty can make informed decisions to influence student outcomes positively. It is achieved by better understanding students' learning abilities and challenges. It facilitates an ingrained cultural & psychological process that uses detailed inputs (student information & environmental and operational parameters) to ensure optimal outputs (students' results).

DA covers two aspects of teaching analytics, i.e. (TA) and learning analytics (LA). TA analyzes the teaching design of lesson plans and reflects on how effective that is for the student learning experience. On the other hand, LA collects and measures student & performance data and analyzes the learning experience, the progress of learners, and the contexts in which learning takes place. The learning context can be refined to understand and optimize learning and the environments in which it occurs to make it more effective for the student (Siemens, 2013; Kerr, 2016; Nguyen et al., 2018a). LA is the measurement, collection, analysis, and reporting of data about learners and their contexts to enhance teaching and learning (Nguyen et al., 2020)**.** Faculty use TA & LA to track real-time digital participation, turn up important insights on student engagement, and reach out to students who need support. TA allows the Faculty to measure, monitor, and respond in real-time to a student's understanding of the material of the development & deliveries. LA showing how students learn can help Faculty adapt their teaching styles and address student needs before the final grade is delivered. While LA may not provide the ultimate answer to improving learning, there is potential to help bridge some gaps between education, psychology, and neuroscience by providing deeper insight into student psycho-neuro behavior as they learn in natural educational settings. When Faculty use DA to drive their teaching & learning decisions and plans, they can respond to problems more effectively, improve instruction, construct new teaching methods, and advance students' skillsets development.

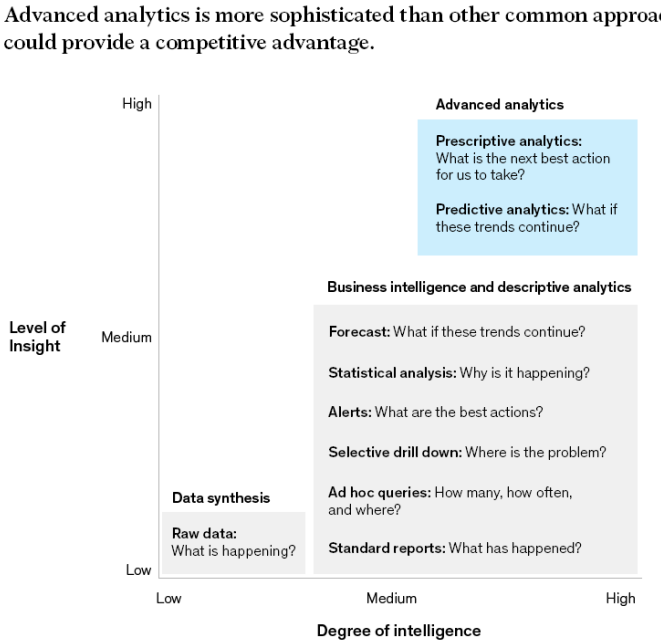

Figure 1: Advanced Analytics using AI (Artificial Intelligence)

Source: Brasca, C., et al., (2022). Using machine learning to improve student success in Higher Education. McKinsey Insights, McKinsey & Company

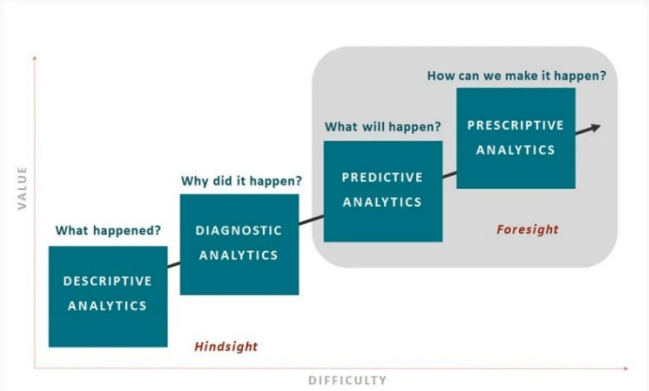

Figure 2: DiMaggio, B., (2021) The Future of Data Analytics in Higher Education is Prescriptive Analytics, retrieved https://www.othot.com/blog/2021-the-future-of-data-analytics-in-higher-education-is-prescriptive-analytics

While DA in HEI is in its infant stage in the eastern sphere HEIs, albeit top tiers HEI, Western Hemisphere HEIs are transiting from the traditional hindsight DA through their IR. Some are moving to advanced analytics techniques into foresight predictive and prescriptive analytics (Figures 1 and 2). It may help HEIs unlock significantly more profound insights into their student populations and identify more nuanced risks than they could achieve through descriptive and diagnostic analytics, which rely on linear, rule-based approaches (Brasca et al., 2022). Foresight advanced analytics uses the power of algorithms to help institutions address unintentional biases

in their existing methods of identifying at-risk students and proactively design tailored interventions to mitigate the majority of identified risks. In this case, the HEI using linear, rule-based approaches, look at indicators like low grades and poor attendance to identify students at risk of dropping out and can reach out to these students by launching initiatives to support them better.

Aims of Paper

The above has highlighted the use & applications of surveys by HEI to understand and provide some insights into the students' perception of needs and expectations and performance of the HEI governance & administration and QA of teaching & learning, facilities, resources & infrastructures, and academic & administrative services & supports. It also discussed the power of the DA as ICP performance metrics for improvements and innovations critical to the student's performance and success as part of the HEI Institutional Research function.

Most HEI has administered surveys as traditionally required perception studies to meet IQA & Accreditation requirements and potentially downplayed their role as key performance metrics to support students' success through DA. To ensure that these critical data are supplied on a semester and annual basis, this paper demonstrates the potential of converting the traditional survey approach into a powerful performance DA system through the use of a case study survey system of a Middle Eastern University over the 2019 to 2021 periods. This empowered DA survey system, i.e., the Performance Analytics Survey System (PASS), is demonstrated through (1) the identification and development of "generic constructs measures" that are common across the six primary surveys of Course Satisfaction (CSS), Student Experience (SES), Faculty & Staff Satisfaction (FSS & SSS), Alumni Satisfaction (ASS) Employment Market Satisfaction (EMS); (2) the use of electronic Strategic Performance Management System (SPMS) to coordinate and consolidate the data collation and processing and the use of IT & AI for EDM for performance DA; and (3) the use of a 5-Levels "Dive-Down" of performance analytics from Institution-Colleges-Programs-Individuals levels to provide dive-down DA to provide more in-depth performance insights.

Powering the Surveys System for Performance Data Analytics

(1) Developing the Surveys System

In any HEI context, within its IQA or Accreditation requirements, qualitative KPIs in the form of surveys are one of the norm practices. These surveys are used to determine the perceptions of its stakeholders of students, staff, Faculty, alumni, and employment market of its "standing in the eyes of the preceptor" of its academic, administrative, governance, services & supports, facilities & infrastructures, goals & outcomes attainments of students. These KPIs come from using six commonly & frequently used surveys, albeit independently of each other. These surveys broadly cover (1) Student experience, (2) Course Satisfaction; (3) Staff Satisfaction; (4) Faculty Satisfaction; (5) Alumni Experience & Satisfaction; and (6) Employment Market Satisfaction. In harnessing the beneficial surveys analytics power, this paper highlights the consolidation of these

surveys into a systematic Performance Analytics Survey System (PASS) approach by ensuring the following:

- ***Survey system objective & purpose*** – In research instrumentation, it is commonly accepted that the aim or purpose of the survey is identified and defined clearly. All the surveys aim to "inform on" critical requirements of academic performance. They cover common areas across the multi- and transdisciplinary aspects of the institution, colleges & programs (ICP) that subscribe to common education pillars of teaching-learning research, administration-governance, and societal responsibility. These are all merged and managed within the teaching-learning-research, administration-governance and societal responsibility, facilities & infrastructure, quality assurance & performance management, and planning systems. It ultimately means that each ICP does not need to "reinvent the wheel" by designing, developing & implementing their surveys, as there are common denominators of academic performance management, measurement, and assessment. These common denominators need to be identified as the "common aims" of the surveys that are generic to the ICP regardless of discipline or specialization, as they are a common attribute of academic performance. Once these higher levels of standard and generic features are determined and guided by the ICP mission, goals & SMART objectives, this serves as the starting point of the generic survey system applied across the ICP.
- ***Standard construct measures across different surveys*** – Based on the common aims of the survey system, generic constructs measures (CM) like University Goals (UG) across critical surveys of (1) Student experience; (2) Staff Satisfaction; (3) Faculty Satisfaction; and (4) Alumni Experience & Satisfaction can be construed generically as standard and comparative measures and analytics (Table 1.1). This paper demonstrates two samples of the Student Experience & Course Satisfaction surveys and their constructs (Tables 1.1 and 1.2). The survey system is shown in the determination of Workforce organizational climate from the Faculty & Staff Satisfaction Surveys in terms of WRe (Work Relationships), WE (Work Environment), WBe (Work Benefits), WD (Work Development) & WBa (Work Balance). These two sets of survey results can be used independently or comparatively to determine the organizational climate of the ICP to provide a more in-depth understanding of these constructs' performance and take action as needed. Another essential generic item is the WF (Work Facilities) & WI (Work Infrastructure), which can be structured generically from the Student Experience, Staff Satisfaction & Faculty Satisfaction surveys (Table 2.2). It allows the "Level 1 Dive-downs" into the specific constructs measures in more detail for more in-depth performance data analytics (Tables 2.1 to 6.2).

Table 1.1 Constructs Measures for Student Experience Instrumentation

	STUDENT EXPERIENCE DIMENSIONS
UG	**UNIVERSITY GOALS**
UG1	I am aware of the University's mission and goals
UG2	I use University mission and goals to guide my study performance at the University
USS	**UNIVERSITY SUPPORT SERVICES**
USS1	Staffs provide administrative service supports when needed
USS2	Staffs are professional in their administrative services provided
USS3	Staffs are knowledgeable in providing guidance to complete an administrative activity
USS4	Provide academic counseling services when needed
USS5	Provide career counseling services when needed
USS6	Provide spaces for spiritual development
USS7	Safeguard my student's rights
USS8	Respect my ideas to improve on the students' experience with the university
UI	**UNIVERSITY INFRASTRUCTURE/ FACILITIES**
UI 1.1	Library and media center has up-to-date material
UI 1.2	Library and media center has copy & print facilities
UI 1.3	Library and media center's climate for study supports my learning
UI 1.4	Digital library's website is user friendly
UI 1.5	Library skill training is provided
UI 1.6	Learning resources is accessible
UI2	I am satisfied with classroom facilities (e.g., lighting, cleanliness, upkeep, maintenance)
UI 3.1	Generally, Information Technology is secure
UI 3.2	Generally, Information Technology is maintained
UI 3.3	Generally, Information Technology is accessible
UI 3.4	Information Technology has up-to-date software
UI 3.5	Generally, I am satisfied with the information technology hardware
UI 3.6	Generally, I am satisfied with the web-based resources (e.g. institutional website, networking, interactivity)
UI4	I am satisfied with State-of-art of the technologies used in my class activities
UI5	I am satisfied with Food catering services
UI6	I am satisfied with the Parking facilities
UI7	I am satisfied with Supporting academic facilities (laboratories, research space, workspace for group discussions)
UE	**UNIVERSITY ENRICHMENT**
UE1	The University offers activities that further my social self-development (student club, athletics, extra-curricular activities that are in addition to academic work)
UE2	The University offers activities that further my ethical self-development
UE3	The University offers Community Service work experience
UE4	The University offers opportunities to participate in international experiences (e.g., practicum, seminar, or conference abroad)
US	**UNIVERSITY OVERALL SATISFACTION**
US1	I am satisfied with the quality of services of the university.
US2	I have a sense of belongingness with the University.
US3	The university experience has contributed to my overall development
US 4	I am satisfied with the university policies defined in Policies Handbooks (e.g., Student Handbook, Program Handbook, Student Rights Handbook)

Table 1.2 Constructs Measures for Course Satisfaction Instrumentation as per KPI 4.12.5 (EEC-SEAA S4.2)

Key Performance Indicators	Survey Source	Attributes Components	
4.12.5 EEC-SEAA S4.2 – Students' overall rating on the quality of their courses	• Course Satisfaction Survey	**CDM**	**COURSE DIMENSIONS**
		CG	**COURSE GOALS:**
		CG1	Course Objectives are stated at the beginning of the term
		CG2	Course Objectives are achieved at the end of the term
		CG3	Course Objectives bring about the intended improvements
		CW	**COURSE WORK**
		CW1	The actual learning tasks/assignments meet the Course Objectives
		CW2	The amount of work I am expected to do to achieve the Course Objectives
		CW3	Time allocated to complete learning task/assignment is suitable for the amount of work done
		CI	**COURSE INITIATIVE**
		CI1	I can plan my learning tasks/assignments according to my work pace
		CI2	I can solve my problems related to my learning tasks/assignments
		CE	**COURSE LEARNING ENVIRONMENT**
		CE1	Learning Environment facilitates in completing learning activities.
		CE2	I enjoy learning together with my friends in this course
		CE3	I am satisfied with the overall learning resources (e.g. course materials, books, learning aids) provided to support my learning activities
		CD	**COURSE DELIVERY**
		CD1	Course Instructor has knowledge of the course contents
		CD2	Course Instructor has skills in communicating across difficult topics in an easy to understanding way
		CD3	Course Instructor uses most recent development in the area in his/her course.
		CD4	Course Instructor encourages to explore the content of the course beyond what is required of the requirements of the textbooks
		CD5	Course Instructor treat students with respect, even when there are differences of opinion
		CA	**COURSE ASSESSMENT**
		CA1	Different variety of assessments was employed in the course
		CA2	Grades assigned is based on my performance in the course
		CO	**COURSE OUTCOMES**
		CO1	Course outcomes are accomplished at the end of the course
		CO 2	Now I have understating of basic knowledge required of this course
		CO 3	I have ability to apply the knowledge gained from the course
		CO4	I have ability to formulate solutions to a problem
		CO5	The course has developed my analytical skills.
		CO6	The course has developed my critical thinking skills
		CO7	The course has developed my communications skills
		CO8	The course has developed my skill to work in a Team.
		OS	**OVERALL, I am satisfied with this course as ……**
		OS1	I get new knowledge that contributes to my overall development
		OS2	I get new skills that contributes to my overall development
		OS3	The course contributed to my overall development

- ***KPIs as performance indicators metric***s have been the norm and performance management practices. Still, if construed appropriately with a common aim in mind of the PASS and appending common and generic constructs measures design and development,

they can serve as robust performance metrics and data analytics. Historically, each survey instrument has been used independently as KPIs specific to its design to determine what it intended to measure as effective independent measures. The 6 KPIs can be expanded into 16 Case Study system KPIs with a common purpose and standard construct measures. It should inform the management and administrators of its 52 Operational IQA & Strategic ICP performance metrics to determine the ICP performance, with the samples as demonstrated (Tables 2.1 to 6.2). It means that the entire composite of Strategic and Operational KPIs meets both the IQA & Accreditation, including reporting on Institution & Collegial Strategic KPIs. Additionally, this would mean that the IQA KPIs subscribe to the Institutional Strategic KPIs performance management and measurement, thus aligning the IQA operations with the Strategic operations designated in the Strategic Plans.

(2) Performance Data Analytics Dive-downs

The primary purposes of the PASS are to ensure that (1) generic construct measures can be identified and developed to allow for common attributes measurement across the six sets of surveys and (2) specific qualitative KPIs can be aligned and aggregated to support performance management across the ICP, (3) detailed dive down from the institution to the collegial to the programmatic, and even down to the individual faculty level can be determined of their performance, (4) the dive downs can allow for comparatives across the colleges in the institution, the programs within the college, the courses within the programs based on levels or clusters, and the courses handled by each specific instructor to determine the comparative performances, and (5) the performance as individualistic "one-off snapshot" or "longitudinal holistic purveys" be taken as positive "areas for improvements" rather than the negatively construed "punishable remedies". While it can be argued that each college, program, and that individual instructor is unique. Within its specialization, we cannot ignore the fact that the pillars of educators are generic. Within the generic aspect, it needs to be construed, identified, and developed as common and comparative construct measures. Developed and used positively with an open mind towards "improvements", the PASS is a powerful mechanism for diving deep down into performance metrics data analytics with a positive attitude towards "opportunities for improvements".

Development of Dive-Down Analytics of KPI from Surveys Construct Measures of Survey Instruments

As noted previously, a qualitative KPI can be construed from different survey constructs measures. The construct measures designed as "statements of measures" in a survey are designed and developed as proxy measures of a specific construct measure. It is illustrated by KPI 1.6.2 of University goals commonly used as awareness statements and perusal as guidance for actions within the ICP. As shown in Table 2.1, the university goals perception evaluation is determined through 2 construct measures reports that are generically constructed across the 3 Student

Experience surveys and Faculty & Staff Satisfaction Surveys. This approach to the design and development of such constructs allows for (1) specific measures of "University Goals" for each of the survey intent and (2) comparatives across the three groups of stakeholders at a specific point in time or across a longitudinal period. This approach allows for an in-depth analysis of the KPIs' performance based on a "root analysis" of the individual statement construct, providing a better understanding of specific performance that leads to opportunities for improvements or commendations to improve the previous performance.

Table 2.1: Dive-Down Analytics for KPI 1.6.2 University Goals from 3 Surveys Constructs Measures

Dive Down of Constructs Measure for KPI 1.6.2 University Goal (UG) from 3 Surveys		
Source of Survey	**1.6.2**	**EEC-SEAA S1.1** – Stakeholders' awareness ratings of the Mission Statement and Objectives
Student Experience – UG University Goals	SES	STUDENT EXPERIENCE DIMENSIONS
	UG1	I am aware of the University's mission and goals
	UG2	I use University mission and goals to guide my study performance at the University
Faculty Satisfaction – WUG University Goals	FSS	FACULTY SATISFACTION DIMENSIONS
	WUG1	I am aware of the University's mission and goals
	WUG2	I use the University mission and goals to guide my work performance at the University
Staff Satisfaction – WUG University Goals	SSS	STAFF SATISFACTION DIMENSIONS
	WUG1	I am aware of the University's mission and goals
	WUG2	I use the University mission and goals to guide my work performance at the University

Table 2.2: Dive-Down Analytics for KPI 7.6.5 Work Facilities from 3 Surveys Constructs Measures

Dive Down of Constructs Measure for KPI 7.6.5 WF (Work Facilities) & UI (Infrastructures) from 3 Surveys		
Source of Survey	**7.6.5**	**EEC-SEAA S7.3 –** Stakeholder evaluation of Websites; e-learning services; Hardware and software; Accessibility; Learning and Teaching; Assessment and service; Web-based electronic data management system or electronic resources
Faculty Satisfaction – WF (Work Facilities) & UI (Infrastructures)	WF	WORK FACILITIES: In general, I am happy with the ……
	WF1	Facilities in the department provided to support my work
	WF2	Institutional infrastructure /facilities (learning resources, digital library, IT services, web services) provided
Staff Satisfaction – WF (Work Facilities) & UI (Infrastructures)	WF	WORK FACILITIES: In general, I am happy with the ……
	WF1	Facilities in the department provided to support my work
	WF2	Institutional infrastructure/facilities (learning resources, digital library, IT services, web services) provided
Student Experience – WF (Work Facilities) & UI (Infrastructures)	WF	WORK FACILITIES: In general, I am happy with the ……
	WF1	Facilities provided to support my work
	WF2	Institutional infrastructure / facilities provided
	UI	UNIVERSITY INFRASTRUCTURE/ FACILITIES:
	UI 3.1	Generally, Information Technology is secure
	UI 3.2	Generally, Information Technology is maintained
	UI 3.3	Generally, Information Technology is accessible
	UI 3.4	Information Technology has up-to-date software
	UI 3.5	Generally, I am satisfied with the information technology hardware
	UI 3.6	Generally, I am satisfied with the web-based resources (e.g. institutional website, networking, interactivity)

Another often surveyed qualitative KPI is the perceptions of the work facilities and infrastructure by its different stakeholders' groups, students, Faculty, and staff in support of their core activities requirements and expectations. In the KPI 7.6.5 work facilities (WF), similar constructs measures statements can be used for each of the three stakeholder groups, which allows for comparative or identification of the status, up-keep, or availability of crucial work supports (Tabel 2.2). For students' WF, it can be dived down further as another sub-KPI of specific Infrastructure of UI. This approach allows for a richer and more discrete set of operands measurements ranging from UI 3.1 to 3.6, better identifying whichever area is an opportunity for improvement.

Another often required but subtle qualitative KPI is the Organization Climate, within which the faculty and staff work to provide their value-added academic & administrative services & support to the students. Again, similar construct measures of WI (Work Initiative), WRe (Work

Relationships), WE (Work Environment), WBe (Work Benefits) & WBa (Work Balance) can be designed and construed as the primary measure for KPI 2.9.2 Organization Climate (Table 2.3). The benefit of this dive-down approach is three-fold to (1) determine the overall faculty and staff Organization Climate as a whole and (2) dive down into each component of WI, WRe, WE. WBe, & WBa to determine and identify whichever area contributes to or destroys the central Organization Climate of the Faculty and staff, and (3) report WI, WRe, WE. WBe, & WBa construct measures independently for a better and more in-depth understanding of each sub-component of the Organization climate separate dive-down or as a whole. These construct measures can be designed similarly across the two survey instruments of faculty & staff satisfaction surveys to allow for comparatives.

Table 2.3: Dive-Down Analytics for KPI 2.9.2 Organization Climate from 2 Surveys Constructs Measures

Dive Down of Constructs Measure for KPI 2.9.2 Organization Climate from 2 Surveys		
Source of Survey	2.9.2	Evaluation of Organization Climate (Means average and Level achieved based on survey)
Faculty Satisfaction – WI (Work Initiative) WRe (Work Relationships) WE (Work Environment) WBe (Work Benefits) & WBa (Work Balance)	**WI**	**WORK INITIATIVE: I have the opportunity to ….. related to my academic and research work**
	WI1	Make decisions
	WI2	Solve problems
	WRe	**WORK RELATIONSHIPS: I am respected by my ……..**
	WRe1	Fellow faculty in my department
	WRe2	Immediate supervisor
	WRe3	Other administrators
	WE	**WORK ENVIRONMENT: In general, the faculty members of my department ……**
	WE1	Cooperate towards the accomplishment of the department mission
	WE2	Treat each other with respect, even when there are differences of opinion
	WE3	Can adapt to changes in the work environment (e.g., new situations, people, ideas)
	WBe	**WORK BENEFITS: In general, I am satisfied with the ……**
	WB1	Compensation (salary and other monetary benefits) for the work accomplished
	WB2	Benefits (insurance, medical and retirements) for my overall well being
	WBa	**WORK BALANCE: In general, I can ……**
	WB1	Balance my work and social life
	WB2	Manage stress resulting from my work
Staff Satisfaction – WF WRe (Work Relationships) WE (Work Environment) WBe (Work Benefits) WD (Work Development) & WBa (Work Balance)	**WRe**	**WORK RELATIONSHIPS: I am respected by my ……..**
	WRe1	Fellow co-workers in my work unit
	WRe2	Immediate supervisor
	WRe3	Other administrators
	WE	**WORK ENVIRONMENT: In general, the members of my work unit ……..**
	WE1	Know how to perform their job responsibilities
	WE2	Work hard to accomplish the unit goals
	WE3	Enjoy working together
	WE4	Treat each other with respect, even when there are differences of opinion
	WE5	Adapt to changes in the work environment (e.g., new situations, people, ideas)
	WE6	Cooperate with each other most of the time
	WBe	**WORK BENEFITS: In general, I am satisfied with the ……**
	WB1	Compensation (salary and other monetary benefits) for the work accomplished
	WB2	Benefits (insurance, medical and retirements) for my overall well being
	WD	**WORK DEVELOPMENT: In general, I feel that I ……**
	WD1	Am given the opportunity to progress in my job
	WD2	Have the opportunity to attend developmental trainings or seminars
	WBa	**WORK BALANCE: In general, I am able to ……**
	WB1	Balance my work and social life
	WB2	Manage stress resulting from my work

A mandatory survey instrument is a course satisfaction survey launched within an IQA or Accreditation system to determine the mid-course and post-course students' satisfaction. Each topical area can serve the use of specific construct measures like CG Course Goals, CW Course Work, CI Course Initiative, CE Course Learning Environment, CD Course Delivery, CA Course Assessment, CO Course Outcomes & OS Overall Satisfaction (Table 2.4) as individual construct measure components. It can provide an in-depth perspective of potential performance issues individually or a holistic picture of the overall performance. The design and logic of the constructs measures for the whole KPI 4.12.7 Course Satisfaction Survey are again three-fold, as discoursed earlier for KPI 2.9.2 Organization Climate (Table 2.3). It can be determined and reported

separately as individual construct measures to identify a specific improvement opportunity or as a full KPI measure.

Table 2.4 Dive-Down Analytics for KPI 4.12.7 from Course Satisfaction Constructs Measures

Dive Down of Constructs Measure for KPI 4.12.7 Course Satisfaction Survey		
Source of Survey	4.12.7	EEC-SEAA S4.2 – Students overall rating on the quality of their courses
Course Satisfaction –		COURSE DIMENSIONS
CG Course Goals	CG	COURSE GOALS:
CW Course Work	CG1	Course Objectives are stated at the beginning of the term
CI Course Initiative	CG2	Course Objectives are achieved at the end of the term
CE Course Learning Environment	CG3	Course Objectives bring about the intended improvements
CD Course Delivery	CW	COURSE WORK:
CA Course Assessment	CW1	The actual learning tasks/assignments meet the Course Objectives
CO Course Outcomes	CW2	The amount of work I am expected to do to achieve the Course Objectives
OS Overall Satisfaction	CW3	Time allocated to complete learning task/assignment is suitable for the amount of work done
	CI	COURSE INITIATIVE:
	CI1	I can plan my learning tasks/assignments according to my work pace
	CI2	I can solve my problems related to my learning tasks/assignments
	CE	COURSE LEARNING ENVIRONMENT:
	CE1	Learning Environment facilitates in completing learning activities.
	CE2	I enjoy learning together with my friends in this course
	CE3	I am satisfied with the overall learning resources (e.g., course materials, books, learning aids) provided to support my learning activities
	CD	COURSE DELIVERY:
	CD1	Course Instructor has knowledge of the course contents
	CD2	Course Instructor has skills in communicating across difficult topics in an easy to understand manner
	CD3	Course Instructor uses most recent development in the area in his/her course.
	CD4	Course Instructor encourages to explore the content of the course beyond what is required of the textbook's requirements
	CD5	Course Instructor treat students with respect, even when there are differences of opinion
	CA	COURSE ASSESSMENT:
	CA1	Different variety of assessment was employed in the course
	CA2	Grades assigned is based on my performance in the course
	CO	COURSE OUTCOMES:
	CO1	Course outcomes are accomplished at the end of the course
	CO 2	Now I have understating of basic knowledge required of this course
	CO 3	I have ability to apply the knowledge gained from the course
	CO4	I have ability to formulate solutions to a problem
	CO5	The course has developed my analytical skills.
	CO6	The course has developed my critical thinking skills
	CO7	The course has developed my communications skills
	CO8	The course has developed my skill to work in a Team.
	OS	OVERALL, I am satisfied with this course as ……
	OS1	I get new knowledge that contributes to my overall development
	OS2	I get new skills that contributes to my overall development
	OS3	The course contributed to my overall development

Dive-Down Performance Analytics of KPI from Surveys Construct Measures of Survey Instruments

Most ICPs have taken survey instruments as requirements of IQA or Accreditation System. If designed, developed, and construed with care, the dive-down constructs measures of the qualitative KPIs can provide better holistic or specific performance metrics and the potential cause of KPI based on its specific construct measures. This paper illustrates how the typical survey system can be transformed into a powerful performance data analytics system. It is demonstrated by the PASS, based on the (1) construct measures components of a KPI and (2) its dive-down capacity to identify specific areas that provide a better understanding of the opportunities for improvements based on the performance data across the ICP and individual instructors of performance management.

The proposed ***Dive-Down Performance Analytics of the KPI*** system is designed to provide different types of dive-down performance analytics as needed by the ICP in key comparative areas of:

(1) ***Dive-down analytics specific to unit's requirements*** – In this case, depending on the unit itself, be it the institution, college, program, and individual Faculty, the dive-down aspect of the constructs measures can report on (a) a specific KPI holistically, (b) specific

construct measure components of each KPI to better identify areas for improvements or strengthening, and (c) potentially leading to additional in-depth "root-cause" or "cause-effect" analytical tools. It represents a powerful ICP mechanism for addressing potential areas of weak performance or improvement opportunities.

(2) ***Level 1 to Level 5 dive-down comparative performance analytics*** – This approach has been greatly ignored on the argument that each college or program cannot be compared as they are uniquely specific to their specialization. While valid, this type of argument ignores the basic academic mission, which is fundamentally highly similar across and serves highly parallel strategic alignment of the mission, values, goals, and SMART objectives across the ICP. These cover highly similar systems of (a) teaching, learning & research, (b) IQA & accreditation, (c) governance, administration, and planning, (d) financial, human resources, facilities & infrastructure; and (societal responsibilities, all of which are the pillars of all ICP regardless of specialization. These commonalities are used to create generic systems to serve the ICP and are aligned to the mission, goals, and SMART Objectives that are more similar than dissimilar across the ICP. These 5 Levels are construed as performance analytics comparative (a) Level 1 across Colleges within the University (Tables 3.1, 4.1, and 5.1 and 7.1); (b) Level 2 across programs within a Specific College (Tables 3.2, 4.2, 5.2 and 7.2); (c) Level 3 across courses within a program (Table 6.1); (d) Level 4 across sections of the same course (Table 6.2); and (e) Level 5 across courses of a single instructor (Table 6.3).

(3) ***Trend analysis of performance data analytics*** – A beneficial feature of the PASS is the provision of "directional arrows" of performance analytics and its comparatives based on rules that can be set up to determine the operational range of good to poor and trending performance. The five main "directional arrows" with specific colors can provide an easy-to-grasp picture of potentially weak performance areas, positively or negatively trending, or potential areas of strengths or improvement opportunities. It is all based on the actual performance data portrayed in these "directional areas" based on defined rules & range of performance parameters. These key “directional arrows” are designated as {Direction & Coloring of Symbols: ⇑ "increased good" ≥ 85; ⇗ "trending up" < 85 and ≥ 70; ⇒ "average" < 70 and ≥ 55; ⇘ "trending down" ⇓ < 55 and ≥ 40; "decreasing problematic" performance < 40 } that are self-explanatory.

(4) ***Longitudinal performance data analytics*** – The performance trend analytics are aimed at a longitudinal analysis over a comparative period that can be performed and identified for specific constructs measures and specific units of analytics to discover its performance trends. This type of longitudinal periodic relative is beneficial to determine a particular period performance that can be meaningless if they are not looked at across a period over semesters or academic years of the KPI, construct measures as a group, or independently. It is a powerful approach to determine the ICP performance based on KPIs or construct measures across a trend period.

Discussion of Dive-Down Performance Analytics from Surveys Construct Measures

(1) Staff and Faculty Satisfaction Index

In any organization, human capital is the critical driver of performance execution and delivery of organizational aspirations. The key drivers of the ICP are the staff and Faculty. They work within their organizational climate and environment. They are represented by constructs measures of WI (Work Initiative), WRe (Work Relationships), WE (Work Environment), WBe (Work Benefits) & WBa (Work Balance). The constructs can be designed and construed as the primary measure for KPI 2.9.2 Organization Climate (Table 2.3). Complementing them with the WUG Goals and WR (Work Responsibilities) completes the entire Faculty, and Staff Satisfaction Surveys construct measures components (Tables 3.1 and 4.1).

Looking at the Staff Satisfaction individually, it appears that the overall staff satisfaction of the Level 1 performance analytics of the institution and its colleges reveals more "red and decreasing trends" across most of the colleges, highlighting that Colleges 1, 2, and 3 have more troubling trends than Colleges 4, 5 and 6 (Table 3.1). Reviewing College 4, and looking at the Level 2 performance analytics across Programs 1 to 6, inevitably shows that College 4 has an overall more positive trend performance as contributed by 3 of its programs 4, 5, and 6 that have consistently much positive staff satisfaction outlook. Deeper dive-down analytics at the Level 1 Institution & Colleges performance indicated that poorer performance areas and potential areas of improvement are in WRe, WF, WD & WL. In contrast, for Colleges 1, 2, and 3, there are more additional performance issues in WB & WE. The College 4 Level 2 performance analytics (Table 3.2) shows that Programs 1, 2 & 3 staff satisfaction is much more troublesome than Programs 4, 5 & 6 in critical areas of WF & WD. Programs 1 & 2 have more issues in AY 2021 than in their previous years' performance in most aspects of the organization climate.

Table 3.1: Level 1 Performance Analytics Comparatives from Staff Satisfaction Constructs Measures across Colleges within University

Staff Satisfaction Survey Comparatives across Colleges with University

	University			College 1			College 2			College 3			College 4			College 5			College 6		
Attibutes	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
WUG Goals	⇓3.37	⇓3.24	⇓3.35	↘3.56	⇓3.38	⇓3.24	⇓3.24	⇓3.38	⇓3.24	⇓3.35	⇓3.38	⇓3.24	⇓3.24	⇓3.27	⇓3.35	⇓3.46	⇓3.45	↘3.55	⇑3.90	⇑3.87	↘3.55
WR Responsibility	↗3.74	↗3.72	↗3.79	↘3.54	↘3.48	↘3.47	↘3.53	↘3.48	↘3.47	↘3.53	↘3.48	↘3.47	⇓3.34	↘3.52	↘3.43	↗3.74	⇓3.38	⇓3.24	↗3.82	↗3.72	⇑3.89
WRe Relationship	⇓3.38	⇓3.24	↗3.82	↗3.77	⇓3.23	⇓3.27	⇓3.35	⇓3.23	⇓3.27	⇓3.35	⇓3.23	⇓3.27	⇓3.38	⇓3.27	↘3.52	⇓3.38	⇓3.33	↘3.42	⇓3.37	⇓3.24	⇓3.32
WE Environment	↘3.55	↘3.43	⇓3.25	⇓3.01	⇓2.94	⇓2.85	⇓2.72	⇓2.98	⇓2.83	⇓2.77	⇓2.67	⇓2.74	⇒3.60	⇒3.65	↘3.55	↘3.54	↘3.55	↘3.55	↘3.47	↘3.45	⇓3.35
WF Facilities	⇓3.38	⇓3.24	↗3.82	⇑4.10	⇓3.38	⇓3.27	⇓3.35	⇓3.38	⇓3.27	⇓3.35	⇓3.38	⇓3.27	⇓3.38	⇓3.24	⇓3.23	⇓3.15	⇓3.24	⇓3.32	⇓3.38	⇓3.23	⇓3.15
WB Benefits	↗3.76	↗3.87	⇓3.23	⇓3.15	⇓3.22	⇓3.23	⇓3.23	⇓3.12	⇓3.23	⇓3.23	⇓3.15	⇓3.12	↗3.76	↘3.47	⇓3.35	⇓3.38	↗3.75	↘3.44	↗3.76	⇓3.35	⇓3.38
WD Development	⇓3.38	⇓3.24	⇓3.35	⇓3.38	⇓3.38	⇓3.17	⇓3.25	⇓3.38	⇓3.27	⇓3.35	⇓3.38	⇓3.27	⇓3.38	⇓3.24	⇓3.27	⇓3.34	⇓3.15	↘3.47	⇓3.23	⇓3.15	↗3.82
WL Leadership	⇓3.37	⇓3.25	↘3.58	↘3.56	⇓3.38	⇓3.24	⇓3.23	⇓3.15	⇓3.24	⇓3.25	⇓3.34	⇓3.24	↘3.41	⇓3.27	↘3.43	⇓3.35	⇓3.38	↘3.55	⇓3.35	⇓3.38	↘3.55
WB Balance	↘3.39	⇓3.24	↘3.42	↘3.56	⇓3.38	⇓3.24	⇓3.35	⇓3.38	⇓3.24	⇓3.35	⇓3.37	⇓3.24	↘3.42	⇓3.23	⇓3.37	⇒3.67	↗3.87	↘3.55	⇓3.38	↘3.47	↘3.45
OS Overall	**↘3.39**	**⇓3.38**	**↘3.42**	**↘3.59**	**⇓3.24**	**↘3.42**	**⇓3.35**	**⇓3.24**	**↘3.42**	**↘3.39**	**⇓3.24**	**↘3.41**	**↘3.39**	**⇓3.37**	**↘3.42**	**↘3.39**	**⇓3.24**	**↘3.42**	**↘3.47**	**↘3.44**	**↘3.53**

Note: Direction & Coloring of Symbols ⇑ "increased good" ↗ "trending up" ⇒ "average" ↘ "trending down" ⇓ "decreasing problematic" performance

Table 3.2: Level 2 Performance Analytics Comparatives from Staff Satisfaction Constructs Measures across Programs within College 4

Staff Satisfaction Survey Comparatives across Programs within College 4

	College 4			Program 1			Program 2			Program 3			Program 4			Program 5			Program 6		
Attibutes	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
WUG Goals	↓3.24	↘3.27	↘3.35	→3.56	↘3.38	↓3.24	↘3.26	↘3.28	↓3.24	↘3.45	↘3.38	↓3.24	↘3.43	↘3.25	↘3.27	↘3.37	↘3.27	↘3.45	↑3.90	↗3.87	→3.55
WR Responsibility	↘3.34	→3.52	↘3.43	→3.56	↘3.38	↓3.24	↘3.44	↘3.28	↓3.24	↘3.35	↘3.34	↓3.24	↘3.41	↓3.24	↘3.32	↘3.42	→3.52	→3.55	↘3.37	→3.47	↘3.45
WRe Relationship	↘3.38	↘3.27	→3.52	→3.67	→3.48	→3.47	→3.53	→3.48	→3.47	→3.53	→3.48	→3.47	↗3.74	↗3.72	↑3.89	↗3.74	↘3.38	↓3.24	↗3.82	↗3.72	↗3.69
WE Environment	→3.60	→3.65	→3.55	↗3.77	↓3.23	↘3.27	↘3.35	↓3.24	↘3.27	↘3.34	↓3.23	↘3.26	↘3.38	↘3.27	↗3.82	↘3.38	↘3.33	↘3.42	↘3.37	↓3.24	↓3.21
WF Facilities	↘3.38	↓3.24	↓3.23	↘3.32	↓2.98	↓2.86	↓2.77	↓2.98	↓2.89	↓2.77	↓2.68	↓2.78	→3.60	↘3.33	↘3.42	↘3.37	→3.55	→3.55	→3.47	↘3.45	↘3.35
WB Benefits	↗3.76	→3.47	↘3.35	↑4.10	↘3.38	↘3.27	↘3.35	↘3.38	↘3.27	↘3.35	↘3.38	↘3.27	↘3.38	↓3.24	↘3.42	↘3.38	↓3.24	↘3.32	↘3.38	↓3.24	↓3.23
WD Development	↘3.38	↓3.24	↘3.27	↗3.76	↓3.22	↓3.23	↓3.23	↓3.12	↓3.23	↓3.23	↓3.15	↓3.12	↗3.76	↗3.87	↗3.88	→3.58	↗3.75	↗3.87	↗3.76	↗3.87	↗3.78
WL Leadership	↘3.41	↘3.27	↘3.43	↗3.77	↘3.35	↓3.17	↘3.25	↘3.38	↘3.27	↘3.36	↘3.38	↘3.27	↘3.38	↓3.24	↗3.82	↗3.74	↗3.72	↑3.89	↘3.38	↓3.24	↗3.82
WB Balance	↘3.42	↓3.23	↘3.37	→3.56	↘3.38	↓3.24	↓3.24	↘3.37	↓3.24	↘3.35	↘3.34	↓3.24	↘3.41	↘3.27	→3.52	↘3.40	↘3.37	→3.55	↘3.44	↘3.45	→3.55
OS Overall	**↘3.39**	**↘3.37**	**↘3.42**	**↘3.38**	**↓3.24**	**↗3.82**	**↗3.82**	**↘3.38**	**↘3.27**	**↘3.35**	**↘3.38**	**↘3.27**	**↘3.35**	**↘3.38**	**↘3.27**	**→3.54**	**→3.56**	**→3.55**	**↗3.82**	**↗3.72**	**→3.59**

Note: Direction & Coloring of Symbols ⇑ "increased good" ↗ "trending up" ⇒ "average" ↘ "trending down" ⇓ "decreasing problematic" performance

Table 4.1: Level 1 Performance Analytics Comparatives from Faculty Satisfaction Constructs Measures across Colleges within University

Faculty Satisfaction Survey Comparatives across Colleges with University

	University			College 1			College 2			College 3			College 4			College 5			College 6		
Attibutes	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
WUG Goals	↘3.38	↘3.27	↗3.82	↗3.82	↓3.24	↘3.27	↘3.35	↓3.24	↘3.27	↘3.35	↓3.24	↘3.27	↘3.38	→3.54	↗3.82	↑3.92	↗3.85	→3.57	↑3.92	↗3.85	→3.57
WR Responsibility	↘3.37	↓3.24	↗3.72	→3.56	↘3.38	↓3.24	↓3.24	↘3.38	↓3.24	↘3.35	↘3.38	↓3.24	↘3.41	↘3.27	↗3.82	↑3.90	↗3.87	→3.55	↑3.90	↗3.87	→3.55
WI Initiative	↗3.88	↑3.94	↗3.82	↗3.75	↓3.23	↘3.27	↘3.35	↘3.38	↘3.27	↓3.24	↘3.38	↘3.27	↗3.88	↑3.94	↗3.88	↗3.76	↗3.87	↗3.78	↗3.88	↑3.94	↗3.88
WRe Relationships	→3.58	↘3.45	→3.47	↗3.82	↘3.27	→3.56	↘3.38	↘3.27	→3.56	↘3.38	↘3.27	→3.56	→3.58	↘3.45	→3.47	↘3.38	↓3.24	→3.62	→3.58	→3.55	→3.67
WE Environment	↗3.74	↗3.72	↗3.79	↑4.07	→3.48	→3.47	→3.53	→3.48	→3.47	→3.53	→3.48	→3.47	↗3.74	↗3.72	↑3.89	↗3.74	↘3.38	↓3.24	↗3.82	↗3.72	↑3.89
WF Facilities	↘3.38	↓3.24	↗3.82	↗3.77	↓3.23	↘3.27	↘3.35	↓3.23	↘3.27	↘3.35	↓3.23	↘3.27	↘3.38	↘3.27	↗3.82	↘3.38	↘3.33	↘3.42	↘3.37	↓3.24	↘3.41
WD Development	↗3.70	→3.65	→3.25	↗3.87	↓2.98	↓2.86	↓2.77	↓2.98	↓2.89	↓2.77	↓2.68	↓2.78	→3.60	→3.65	→3.55	→3.54	→3.55	→3.55	↘3.47	↘3.45	↘3.35
WB Benefits	↘3.38	↓3.24	↗3.82	↑4.10	↘3.38	↘3.27	↘3.35	↘3.38	↘3.27	↘3.35	↘3.38	↘3.27	↘3.38	↓3.24	↗3.82	↘3.38	↓3.24	↘3.32	↘3.38	↓3.24	↓3.23
WL Leadership	↗3.76	↗3.87	↗3.78	↗3.76	↓3.22	↓3.23	↓3.23	↓3.12	↓3.23	↓3.23	↓3.15	↓3.12	↗3.76	↗3.87	↗3.88	→3.58	↗3.75	↗3.87	↗3.76	↗3.87	↗3.78
WO Outcomes	↘3.38	↓3.24	↗3.82	↗3.77	↘3.38	↓3.17	↘3.25	↘3.38	↘3.27	↘3.35	↘3.38	↘3.27	↘3.38	↓3.24	↗3.82	↗3.74	↗3.72	↑3.89	↘3.38	↓3.24	↗3.82
WB Balance	↘3.33	↗3.78	↗3.77	→3.66	→3.57	↓3.15	↘3.26	→3.57	↓3.15	↘3.26	→3.57	↓3.15	↘3.33	↗3.88	↗3.77	↘3.33	↗3.78	↗3.77	↘3.33	↗3.78	↗3.77
OS Overall	**↘3.38**	**↓3.24**	**↗3.82**	**↗3.82**	**↘3.38**	**↘3.27**	**↘3.35**	**↘3.38**	**↘3.27**	**↘3.35**	**↘3.38**	**↘3.27**	**↘3.38**	**↗3.69**	**↗3.88**	**↘3.38**	**↓3.24**	**↗3.82**	**↘3.38**	**↓3.24**	**↗3.82**

Note: Direction & Coloring of Symbols ⇑ "increased good" ↗ "trending up" ⇒ "average" ↘ "trending down" ⇓ "decreasing problematic" performance

Faculty Satisfaction has highly similar constructs measures with Staff Satisfaction, with the exception that WI (Work Initiative) and WO (Work Outcomes) are not used in the Staff Satisfaction (Table 4.1). On the comparatives side of the Faculty & Staff (Tables 3.1 & 4.1), it appears that the Faculty is much more optimistic about the Organization Climate than the staff. They have a similar issue: Faculty of Colleges 1, 2 & 3 have more complex trending performance analytics than Colleges 4, 5 & 6. Dive-down analytics potentially show that WD & WL are difficult trending areas that need to be addressed. The performance analytics clearly show that Colleges 1, 2 & 3 potentially have more issues regarding the Organization Climate construct measures for both Staff and Faculty, but with more issues regarding the staff than the Faculty (Tables 3.1 & 4.1).

At the College Level 2 performance analytics of Faculty Satisfaction (Table 4.2), the overall College 4 shows positive trending Organization Climate performance. The programs' comparative shows that Programs 3 & 4 have relatively much lower trending outlooks in the past three years but a looming worsening issue in AY 2021 compared to Programs 1, 2, 5 & 6.

Table 4.2: Level 2 Performance Analytics Comparatives from Faculty Satisfaction Constructs Measures across Programs within College 4

Faculty Satisfaction Survey Comparatives across Programs within College 4

	College 4			Program 1			Program 2			Program 3			Program 4			Program 5			Program 6		
Attibutes	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
WUG Goals	3.38	3.54	3.82	3.38	3.27	3.82	3.82	4.11	4.06	3.35	3.24	3.27	3.35	3.38	3.27	3.82	4.11	4.06	3.92	3.85	3.57
WR Responsibility	3.41	3.27	3.82	3.38	3.24	3.72	4.10	4.01	4.15	3.35	3.38	3.24	3.35	3.27	3.35	3.77	3.98	3.97	3.90	3.87	3.55
WI Initiative	3.88	3.94	3.88	3.88	3.94	3.88	3.75	3.98	3.97	3.35	3.38	3.27	3.41	3.35	3.27	3.77	3.87	3.97	3.88	3.94	3.88
WRe Relationships	3.58	3.45	3.47	3.58	3.75	3.87	3.82	4.11	4.06	3.38	3.27	3.56	3.57	3.38	3.24	3.82	4.11	4.06	3.58	3.75	3.87
WE Environment	3.74	3.72	3.89	3.74	3.72	3.89	4.07	4.05	4.15	3.53	3.48	3.47	3.43	3.48	3.47	4.10	3.96	4.15	3.74	3.72	3.89
WF Facilities	3.38	3.27	3.82	3.38	3.24	3.82	3.77	3.98	3.97	3.35	3.23	3.27	3.35	3.38	3.27	3.77	3.98	3.97	3.38	3.24	3.82
WD Development	3.60	3.65	3.55	3.90	3.85	3.55	3.87	4.10	4.05	2.77	2.98	2.89	2.77	2.98	2.88	4.10	4.20	4.05	3.90	3.85	3.55
WB Benefits	3.38	3.24	3.82	3.38	3.24	3.82	4.10	3.89	4.01	3.35	3.38	3.27	3.35	3.38	3.24	3.77	3.98	3.97	3.38	3.24	3.82
WL Leadership	3.76	3.87	3.88	3.76	3.87	3.78	3.76	3.89	3.87	3.23	3.22	3.23	3.23	3.22	3.25	4.10	3.89	4.07	3.76	3.87	3.78
WO Outcomes	3.38	3.24	3.82	3.38	3.24	3.82	3.77	3.98	3.97	3.35	3.38	3.27	3.35	3.38	3.27	3.82	4.11	4.06	3.38	3.24	3.82
WB Balance	3.33	3.88	3.77	3.33	3.78	3.77	3.66	3.52	3.69	3.26	3.57	3.15	3.26	3.57	3.25	3.66	3.52	3.59	3.33	3.78	3.77
OS Overall	**3.38**	**3.69**	**3.88**	**3.38**	**3.24**	**3.82**	**3.82**	**4.11**	**4.06**	**3.35**	**3.38**	**3.27**	**3.35**	**3.38**	**3.27**	**3.77**	**3.89**	**4.07**	**3.38**	**3.24**	**3.82**

Note: Direction & Coloring of Symbols ⇑ "increased good" ⇗ "trending up" ⇒ "average" ⇘ "trending down" ⇓ "decreasing problematic" performance

(2) Student Experience Survey

The Student Experience Survey construct measures depict a similar rationale in the performance analytics application. It is to identify and determine the Level 1 performance of institutions & Colleges. Level 2 Colleges & Programs performance can be applied to all the qualitative KPIs and Dive-down analytics to determine potential areas of weakness and opportunities for improvements. In the case of the Student Experience, as compared to the university, Colleges 1 & 5 are potentially problematic colleges in creating and delivering on high;y satisfying student experiences in all aspects of assessment (Table 5.1).

Table 5.1: Level 1 Performance Analytics Comparatives from Student Experience Constructs Measures across Colleges within University

Student Experience Survey Comparatives across Colleges with University

	University			College 1			College 2			College 3			College 4			College 5			College 6		
Attibutes	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
WUG Goals	3.76	3.87	3.78	3.23	3.22	3.25	3.76	3.87	4.01	3.76	3.87	3.78	4.10	3.89	4.15	3.23	3.22	3.23	4.10	3.89	4.17
USS Services	3.88	3.94	3.88	3.33	3.38	3.27	3.88	3.94	3.88	3.88	3.94	3.88	3.77	3.98	3.97	3.35	3.38	3.27	3.77	3.98	3.97
UI Infrastructure	3.74	3.72	3.89	3.53	3.48	3.47	3.74	3.72	3.78	3.74	3.72	3.89	4.07	4.20	4.15	3.53	3.48	3.47	4.10	4.20	4.15
UE Enrichment	3.69	3.83	3.99	3.26	3.57	3.25	3.69	3.83	3.99	3.69	3.83	3.99	3.86	3.77	3.98	3.26	3.57	3.25	3.86	3.77	3.98
US Ov Satisfaction	3.75	3.66	3.76	3.26	3.44	3.28	3.72	3.61	3.75	3.74	3.62	3.84	4.05	4.14	4.15	3.26	3.44	3.28	4.11	4.15	4.04
Ov. Student Exp.	3.77	3.76	3.88	3.26	3.44	3.28	3.77	3.66	3.88	3.77	3.66	3.88	4.10	4.12	4.17	3.26	3.44	3.28	4.10	4.06	4.07

Note: Direction & Coloring of Symbols ⇑ "increased good" ⇗ "trending up" ⇒ "average" ⇘ "trending down" ⇓ "decreasing problematic" performance

Though College 4 Level 1 performance analytics at institutional comparison is relatively positive, Level 2 College and programs performance analytics indicate that Programs 3 & 6 are potentially problematic programs with exceedingly lower and down-trending performance analytics compared to other programs within College 4 (Table 5.1). It shows that these higher levels and dive-down performance analysis based on the analytics can provide a better performance picture to nip the issues in the bud, specific to poorer-performing units. In addition, it can identify the "root cause" or the application of "cause-effect" for better understanding and to address problem areas.

Table 5.2: Level 2 Performance Analytics Comparatives from Student Experience Constructs Measures across Programs within College 4

Student Experience Survey Comparatives across Programs within College 4

	College 4			Program 1			Program 2			Program 3			Program 4			Program 5			Program 6		
Attibutes	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
WUG Goals	⇑4.10	⇒3.89	⇑4.15	⇒3.76	⇒3.87	⇒3.78	⇑4.10	⇒3.79	⇑4.15	⇓3.23	⇓3.22	⇓3.23	⇒3.76	⇒3.87	⇒3.78	⇑4.10	⇒3.89	⇑4.17	⇓3.23	⇓3.22	⇓3.25
USS Services	⇒3.77	⇗3.98	⇗3.97	⇘3.68	⇗3.94	⇘3.72	⇒3.77	⇗3.98	⇗3.97	⇓3.35	⇓3.38	⇓3.27	⇒3.88	⇗3.94	⇒3.88	⇒3.77	⇗3.98	⇗3.97	⇓3.33	⇓3.38	⇓3.27
UI Infrastructure	⇑4.07	⇑4.20	⇑4.15	⇘3.74	⇘3.72	⇒3.89	⇑4.07	⇑4.20	⇑4.15	⇓3.53	⇓3.48	⇓3.47	⇘3.74	⇘3.72	⇒3.89	⇑4.10	⇑4.20	⇑4.15	⇓3.53	⇓3.48	⇓3.47
UE Enrichment	⇒3.86	⇒3.77	⇗3.98	⇘3.69	⇒3.83	⇒3.79	⇒3.86	⇒3.77	⇗3.98	⇓3.26	⇓3.57	⇓3.25	⇘3.69	⇒3.83	⇒3.79	⇒3.86	⇒3.77	⇗3.98	⇓3.26	⇓3.57	⇓3.25
US Ov Satisfaction	⇗4.05	⇑4.14	⇑4.15	⇓3.57	⇓3.60	⇒3.88	⇑4.10	⇑4.12	⇑4.06	⇓3.26	⇓3.34	⇓3.33	⇒3.77	⇓3.56	⇒3.88	⇑4.10	⇑4.12	⇑4.07	⇓3.26	⇓3.24	⇓3.38
Ov. Student Exp.	**⇑4.10**	**⇑4.12**	**⇑4.17**	**⇒3.77**	**⇒3.76**	**⇒3.88**	**⇑4.11**	**⇑4.13**	**⇑4.17**	**⇓3.26**	**⇓3.44**	**⇓3.28**	**⇒3.77**	**⇓3.66**	**⇒3.89**	**⇗4.01**	**⇑4.10**	**⇑4.14**	**⇓3.26**	**⇓3.44**	**⇓3.28**

Note: Direction & Coloring of Symbols ⇑ "increased good" ⇗ "trending up" ⇒ "average" ⇘ "trending down" ⇓ "decreasing problematic" performance

(3) Course Satisfaction Survey

The Course Satisfaction Survey, being a rather mandatory survey in most ICPs, is typically taken pre- & post-course to provide for the overall course performance analytics for each course in each semester. If used conscientiously, it is a robust set of performance assessments of a course based on key constructs of CG, CW, CI, CE, CD, CA, CO, OS & Overall Course Satisfaction. As demonstrated in the Level 3 Program and Courses performance analytics, it can provide an overall perspective as to which course is not performing well, which in this case are Courses 103 & 104, especially with more negative and pooer performance in AY 2021 (Table 6.1).

Table 6.1: Level 3 Performance Analytics Comparatives from Course Satisfaction Constructs Measures across Courses within Program 4

Course Satisfaction Survey Comparatives across Level 1 Courses in Program 4

	Program 4			Course 101			Course 102			Course 103			Course 104			Course 105			Course 106		
Attibutes	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
CG Goals	⇗3.90	⇗3.85	⇘3.55	⇗3.90	⇗3.85	⇘3.55	⇑4.11	⇑4.20	⇑4.05	⇓2.77	⇓2.98	⇓2.89	⇓2.77	⇓2.98	⇓2.88	⇑4.10	⇑4.20	⇑4.15	⇗3.90	⇗3.85	⇘3.55
CW Work	⇓3.33	⇗3.88	⇒3.77	⇓3.33	⇗3.88	⇒3.77	⇒3.66	⇘3.52	⇒3.69	⇓3.26	⇒3.57	⇓3.15	⇓3.26	⇒3.57	⇘3.25	⇒3.66	⇘3.52	⇒3.59	⇓3.33	⇗3.88	⇒3.77
CI Initiative	⇒3.76	⇗3.87	⇑4.01	⇒3.76	⇗3.87	⇗3.78	⇑4.10	⇗3.89	⇑4.15	⇓3.23	⇓3.22	⇓3.23	⇓3.23	⇓3.22	⇓3.25	⇑4.10	⇗3.89	⇑4.17	⇒3.76	⇗3.87	⇗3.78
CE Learning Env.	⇗3.88	⇗3.94	⇗3.88	⇗3.88	⇗3.94	⇗3.88	⇒3.77	⇗3.98	⇗3.97	⇘3.35	⇘3.38	⇓3.27	⇓3.33	⇘3.38	⇓3.27	⇒3.77	⇗3.98	⇗3.97	⇗3.88	⇗3.94	⇗3.88
CD Delivery	⇒3.58	⇒3.75	⇑4.08	⇒3.58	⇒3.75	⇗3.87	⇗3.82	⇑4.11	⇑4.06	⇘3.38	⇓3.27	⇒3.56	⇒3.57	⇘3.38	⇓3.27	⇗3.82	⇑4.11	⇑4.06	⇒3.58	⇒3.75	⇗3.87
CA Assessment	⇒3.74	⇒3.72	⇗3.89	⇒3.74	⇒3.72	⇗3.89	⇑4.07	⇑4.20	⇑4.15	⇘3.53	⇘3.48	⇘3.47	3..53	⇘3.48	⇘3.47	⇑4.10	⇑4.20	⇑4.15	⇒3.74	⇒3.72	⇗3.89
CO Outcomes	⇒3.69	⇗3.83	⇑3.99	⇒3.69	⇗3.83	⇑3.99	⇗3.86	⇒3.77	⇗3.98	⇓3.26	⇒3.57	⇓3.25	⇓3.26	⇒3.57	⇓3.25	⇗3.86	⇒3.77	⇗3.98	⇒3.69	⇗3.83	⇑3.99
OS Overall Satis.	⇒3.77	⇒3.66	⇗3.88	⇒3.77	⇒3.66	⇗3.88	⇑4.10	⇑4.10	⇑4.17	⇓3.26	⇘3.44	⇓3.28	⇓3.26	⇘3.44	⇓3.28	⇑4.10	⇑4.10	⇑4.07	⇒3.77	⇒3.66	⇗3.88
Ov. Course Satis.	**⇘3.53**	**⇗3.86**	**⇗3.94**	**⇘3.53**	**⇗3.86**	**⇗3.94**	**⇗3.89**	**⇑3.99**	**⇑4.05**	**⇓3.26**	**⇘3.47**	**⇓3.28**	**⇓3.26**	**⇘3.47**	**⇓3.28**	**⇗3.89**	**⇑3.99**	**⇑4.15**	**⇘3.53**	**⇗3.86**	**⇗3.94**

Note: Direction & Coloring of Symbols ⇑ "increased good" ⇗ "trending up" ⇒ "average" ⇘ "trending down" ⇓ "decreasing problematic" performance

Table 6.2: Level 4 Performance Analytics Comparatives from Course Satisfaction Constructs Measures across Sections within Course 101

Course Satisfaction Survey Comparatives across Course 101 Sections 1 to 6

	Course 101			Section 1			Section 2			Section 3			Section 4			Section 5			Section 6		
Attibutes	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
CG Goals	⇗3.90	⇗3.85	⇘3.55	⇒3.26	⇒3.67	⇘3.25	⇓2.77	⇓2.98	⇓2.88	⇗3.89	⇑4.15	⇑4.02	⇘3.33	⇗3.88	⇗3.77	⇑4.25	⇑4.30	⇑4.33	⇑4.10	⇑4.20	⇑4.15
CW Work	⇘3.33	⇗3.88	⇒3.77	⇒3.48	⇘3.26	⇒3.44	⇘3.26	⇒3.57	⇘3.25	⇗3.75	⇒3.76	⇗3.88	⇒3.43	⇒3.62	⇒3.52	⇒3.66	⇒3.52	⇗3.99	⇒3.66	⇒3.52	⇓3.59
CI Initiative	⇗3.76	⇗3.87	⇗3.78	⇘3.26	⇗3.75	⇘3.38	⇘3.23	⇘3.22	⇘3.25	⇗3.72	⇒3.52	⇗3.99	⇘3.26	⇒3.67	⇘3.25	⇒3.66	⇒3.52	⇑4.09	⇑4.10	⇗3.89	⇑4.15
CE Learning Env.	⇗3.88	⇗3.94	⇗3.88	⇓2.77	⇓2.87	⇓2.76	⇘3.33	⇘3.38	⇘3.27	⇗3.83	⇒3.52	⇑4.09	⇘3.35	⇒3.52	⇘3.22	⇑4.10	⇑4.20	⇑4.15	⇗3.77	⇗3.98	⇒3.97
CD Delivery	⇒3.58	⇗3.75	⇗3.87	⇓2.88	⇓2.86	⇓2.79	⇓2.87	⇓2.77	⇓2.92	⇘3.33	⇗3.88	⇗3.77	⇒3.66	⇒3.52	⇒3.59	⇒3.66	⇒3.52	⇗3.89	⇗3.82	⇑4.11	⇑4.06
CA Assessment	⇗3.74	⇗3.72	⇗3.89	⇘3.33	⇒3.48	⇗3.77	⇘3.24	⇘3.15	⇒3.47	⇒3.53	⇗3.86	⇗3.84	⇒3.57	⇗3.75	⇒3.56	⇗3.98	⇗3.97	⇑4.11	⇑4.10	⇑4.20	⇑4.15
CO Outcomes	⇒3.69	⇗3.83	⇑3.99	⇓2.98	⇓2.86	⇓2.83	⇒3.26	⇒3.57	⇘3.25	⇘3.33	⇗3.88	⇗3.77	⇒3.26	⇒3.57	⇘3.25	⇑4.10	⇑4.20	⇑4.15	⇗3.86	⇗3.77	⇒3.98
OS Overall Satis.	⇗3.77	⇒3.66	⇗3.88	⇘3.26	⇒3.44	⇒3.66	⇘3.26	⇒3.44	⇘3.28	⇗3.62	⇒3.52	⇗3.99	⇒3.66	⇒3.52	⇒3.59	⇗3.86	⇗3.77	⇗3.98	⇑4.10	⇑4.10	⇑4.17
Ov. Course Satis.	**⇒3.53**	**⇗3.86**	**⇗3.94**	**⇒3.53**	**⇒3.48**	**⇒3.57**	**⇘3.26**	**⇘3.25**	**⇘3.26**	**⇒3.46**	**⇒3.52**	**⇗3.87**	**⇒3.55**	**⇒3.66**	**⇒3.46**	**⇑4.10**	**⇑4.20**	**⇑4.15**	**⇗3.89**	**⇗3.99**	**⇑4.15**

Note: Direction & Coloring of Symbols ⇑ "increased good" ⇗ "trending up" ⇒ "average" ⇘ "trending down" ⇓ "decreasing problematic" performance

Another perspective can be developed from the performance analytics of the Level 4 Sections within a Course comparative. For Course 101, it is highly evident that Sections 1 & 2 are potential problematic areas, which can be attributable to CG & CD for Section 2, and CE, CD, and CO for Section 1. It can allow the instructor to handle those Sections in critical areas that are lower and trending poorly over the last three years to address specific performance areas.

Table 6.3: Level 5 Performance Analytics Comparatives from Course Satisfaction Constructs Measures across all courses of 1 Instructor

Course Satisfaction Survey Comparatives across different Courses of 1 Instructor

	All Cses			C 101 S1			C 101 S2			C 101 S3			C 205			C 302			C 401		
Attibutes	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
CG Goals	⇒3.63	↗3.76	⇑3.88	↓3.43	↘3.52	↓3.37	↓3.43	↘3.52	↓3.37	↓3.43	↘3.52	↓3.37	↓3.23	↓3.22	↓3.25	↓3.44	↘3.47	↘3.53	⇒3.63	↗3.76	⇑3.87
CW Work	↓3.43	⇑3.88	⇑3.87	↓3.26	↓3.37	↓3.25	↓3.25	↓3.28	↓3.27	↓3.43	↘3.52	↓3.37	↓3.25	↓3.28	↓3.27	↓3.23	↓3.22	↓3.25	↓3.43	↗3.72	↗3.75
CI Initiative	⇒3.63	↗3.76	⇑3.95	↓3.43	↘3.52	↓3.37	↓3.23	↓3.32	↓3.35	↓3.23	↓3.22	↓3.25	↓3.26	↓3.27	↓3.25	↘3.47	⇒3.63	↗3.75	↘3.54	↘3.58	↗3.77
CE Learning Env.	⇒3.63	↗3.72	↗3.75	↓3.23	↓3.12	↓3.25	↓3.43	↘3.52	↓3.37	↓3.25	↓3.28	↓3.27	↓3.43	↘3.52	↓3.37	↓3.13	⇑3.88	⇑3.87	⇒3.63	↗3.76	⇑3.87
CD Delivery	↓3.33	⇑3.88	⇑3.97	↓3.34	↓3.27	↓3.25	↓3.26	↓3.17	↓3.25	↘3.53	↘3.58	⇒3.67	↘3.53	⇑3.86	↗3.84	↘3.57	↗3.75	↘3.56	⇒3.66	⇑3.88	⇑3.94
CA Assessment	↘3.53	⇑3.86	⇑3.96	↓3.23	↓3.32	↓3.31	↓3.43	↘3.52	↗3.75	↓3.43	↘3.52	↓3.37	↓3.33	⇑3.88	↗3.77	⇒3.63	↗3.76	⇑3.87	↓3.43	↘3.58	↗3.75
CO Outcomes	⇒3.63	↗3.76	⇑3.87	↓3.22	↓3.42	↓3.10	↓3.23	↓3.22	↓3.25	↘3.53	⇑3.86	↘3.57	↓3.43	↓3.42	↘3.57	↘3.50	↗3.77	⇒3.67	↘3.47	↗3.74	↗3.82
OS Overall Satis.	↗3.79	↗3.80	↗3.82	↓3.13	↓3.22	↓3.25	↓3.32	↘3.58	↓3.37	↓3.33	↘3.58	↘3.47	↓3.43	↘3.52	↓3.34	↘3.57	↘3.47	↗3.75	↓3.43	⇒3.69	↗3.83
Ov. Course Satis.	**↗3.76**	**⇑3.88**	**⇑3.98**	**↓3.25**	**↓3.28**	**↓3.27**	**↓3.32**	**↘3.48**	**↘3.47**	**↓3.43**	**↘3.52**	**↓3.37**	**↓3.43**	**↘3.57**	**⇒3.68**	**⇒3.63**	**↗3.76**	**⇑3.87**	**↘3.53**	**↗3.81**	**⇑3.85**

Note: Direction & Coloring of Symbols ⇑ "increased good" ↗ "trending up" ⇒ "average" ↘ "trending down" ⇓ "decreasing problematic" performance

A more specific Level 5 Performance Analytics of the performance of all the courses handled by an instructor (Table 6.3) can provide rich information on an instructor's teaching & learning academic performance. In this case, compared to all courses in the program, this specific instructor is not doing well in having lower-level courses like the First Year C 101 S1, S2 & S3, and Second Year C 205. This instructor is doing quite well in the Third & Fourth Year Courses like C 302 & C 401. This type of performance analytics can potentially point to the assignment of courses that are not within the scope of the instructor's knowledge & skills or not appropriate to the types of students, like entry levels students as compared to higher levels students that the instructor can handle. On the other hand, it can also signify that the instructor is a consistently poor performer compared to their peers and whether the developmental efforts over the AY 2019 – 2021 are not in place or not contributing to the instructor's improvements.

The Course Satisfaction, used in tandem and complement the Staff & Faculty, and Student Experience Surveys, can be used as a "cause-effect" analytical approach. It allows for a more in-depth performance analysis at Levels 1 to 5 as deemed necessary or adequate to inform better-informed decision-making based on performance analytics.

(4) Dive-down performance analytics of KPI

Another often required KPI is the understanding & use of the University Goals, mainly the mission and critical goals of the ICP, to guide the ICP in all academic and administrative strategic & operational directions, actions & activities. Two highly similar construct measures of Goals (UG1 & UG2) across the Student Experience (SES), Faculty & Staff Satisfaction (FSS & SSS), are used to illustrate the KPI 1.6.2 University Goals Performance analytics (Tables 7.1 & 7.2). The Level

1 performance analytics across colleges within the university (Table 7.1) shows Colleges 1, 2 & 5 SES's University Goals performance faring negatively compared to Colleges 3, 4 & 6. Colleges 1, 3 &5 are not coping well in FSS, with Colleges 1, 2, 3 & 4 not performing well in SSS. The dive down itself of the University Goals shows which of the constructs measures contribute to the poorer trending performance, especially in College 1, which does not fare well in all the SES, FSS & SSS compared to the other colleges. In addition, Colleges 2, 3 & 5 do not report positively trending University Goals understanding and utilization in 2 out of the three surveys. It demonstrates that, used independently or holistically in comparison, the performance analytics of the University Goals can point to areas for improvements across the colleges of its students, Faculty, or staff to address potential issues and take remedial actions as appropriate.

Table 7.1: Level 1 Dive Down Construct Measures of KPI 1.6.2 (University Goals) across Colleges within the University

Level 1 Dive Down Analytics of KPI 1.6.2 UG University Goals across Colleges with University

	University			College 1			College 2			College 3			College 4			College 5			College 6		
Attibutes	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
SES Goals	3.76	3.87	3.78	3.23	3.22	3.25	3.23	3.33	3.16	3.76	3.87	3.78	3.88	3.79	3.84	3.23	3.22	3.23	4.10	3.89	4.17
SES UG1	3.68	3.24	3.82	3.47	3.38	3.17	3.25	3.38	3.27	3.35	3.38	3.27	3.78	3.74	3.82	3.54	3.32	3.39	3.98	3.64	3.82
SES UG2	3.73	3.78	3.77	3.66	3.57	3.15	3.26	3.28	3.15	3.26	3.57	3.15	3.83	3.88	3.77	3.33	3.48	3.27	3.93	3.78	3.77
FSS Goals	3.38	3.54	3.82	3.38	3.27	3.42	3.82	4.11	4.06	3.35	3.24	3.27	3.35	3.38	3.27	3.82	3.88	4.06	3.92	3.85	3.87
FSS UG1	3.37	3.25	3.68	3.56	3.38	3.24	3.73	4.05	3.94	3.25	3.34	3.24	3.41	3.27	3.43	3.75	3.98	3.95	3.75	3.78	3.75
FSS UG2	3.33	3.78	3.77	3.66	3.47	3.15	3.76	3.87	3.85	3.26	3.57	3.15	3.33	3.38	3.47	3.63	3.78	3.97	3.63	3.68	3.67
SSS Goals	3.37	3.24	3.35	3.56	3.38	3.24	3.24	3.38	3.24	3.35	3.38	3.24	3.24	3.27	3.35	3.46	3.45	3.55	3.90	3.87	3.55
SSS UG1	3.37	3.25	3.58	3.46	3.28	3.14	3.23	3.15	3.24	3.25	3.34	3.24	3.41	3.27	3.43	3.35	3.38	3.55	3.35	3.38	3.55
SSS UG2	3.39	3.24	3.42	3.36	3.18	3.04	3.35	3.38	3.24	3.35	3.37	3.24	3.42	3.23	3.37	3.67	3.87	3.55	3.38	3.47	3.45

Note: Direction & Coloring of Symbols ⇑ "increased good" ⇗ "trending up" ⇒ "average" ⇘ "trending down" ⇓ "decreasing problematic" performance

Table 7.2: Level 2 Dive Down Construct Measures of KPI 1.6.2 (University Goals) across Programs within College 4

Level 2 Dive Down Analytics of KPI 1.6.2 UG University Goals across Programs within College 4

	College 4			Program 1			Program 2			Program 3			Program 4			Program 5			Program 6		
Attibutes	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
SES Goals	3.88	3.79	3.84	3.76	3.87	3.78	4.10	3.79	4.15	3.23	3.22	3.23	3.76	3.87	3.78	4.10	3.89	4.17	3.23	3.22	3.25
SES UG1	3.78	3.74	3.82	3.69	3.83	3.79	3.86	3.77	3.98	3.26	3.57	3.25	3.69	3.83	3.79	3.86	3.77	3.98	3.26	3.57	3.25
SES UG2	3.83	3.88	3.77	3.57	3.60	3.88	4.10	4.12	4.06	3.26	3.34	3.33	3.77	3.56	3.88	4.10	4.12	4.07	3.26	3.24	3.38
FSS Goals	3.35	3.38	3.27	3.38	3.27	3.82	3.82	4.11	4.06	3.35	3.24	3.27	3.35	3.38	3.27	3.82	4.11	4.06	3.25	3.36	3.25
FSS UG1	3.41	3.27	3.43	3.38	3.24	3.82	3.77	3.98	3.97	3.35	3.38	3.27	3.35	3.38	3.27	3.82	4.11	4.06	3.38	3.24	3.31
FSS UG2	3.33	3.38	3.47	3.33	3.78	3.77	3.66	3.52	3.69	3.26	3.57	3.15	3.26	3.57	3.25	3.66	3.52	3.59	3.33	3.78	3.18
SSS Goals	3.24	3.27	3.35	3.56	3.38	3.24	3.26	3.28	3.24	3.45	3.38	3.24	3.43	3.25	3.27	3.37	3.27	3.45	3.90	3.56	3.55
SSS UG1	3.41	3.27	3.43	3.56	3.38	3.24	3.24	3.37	3.24	3.35	3.34	3.24	3.41	3.27	3.52	3.40	3.37	3.55	3.44	3.45	3.55
SSS UG2	3.42	3.23	3.37	3.38	3.24	3.82	3.82	3.38	3.27	3.35	3.38	3.27	3.35	3.38	3.27	3.54	3.56	3.55	3.82	3.72	3.59

Note: Direction & Coloring of Symbols ⇑ "increased good" ⇗ "trending up" ⇒ "average" ⇘ "trending down" ⇓ "decreasing problematic" performance

The Level 2 Dive-down performance analytics of College 4 and its programs (Table 7.2) highlights more negative and downward trending performance in the FSS & SSS University Goals understanding & utilization than the SES. While Programs 2 & 5 are faring better than the other programs in the FSS, the SSS shows highly poor and negatively trending performance for most programs.

Implications

While there exist multifarious implications from developing and using a set of surveys independently albeit collectively for informed decisions, as discoursed previously, three sets of prerequisites need to be developed and put in place before embarking on the potentially highly beneficial PASS. Even though each survey can independently provide a specific measure, the PASS has demonstrated a strong justification that re-positioning all the surveys and mutually aligning them can improve performance management through DA. These three sets of implied provisions of the PASS are:

- ***Empowering Performance Analytics through a strategically aligned surveys system*** (Teay, 2022) – The bottom line is the first essential step in designing and developing highly similar constructs measures that are the critical base of the survey systems. There are highly common generics across all ICPs in critical areas of teaching, learning & research, governance, administration and planning, IQA & accreditation, academic & administrative services & support facilities infrastructure & systems, and societal responsibilities. It should not be ignored. Failing to capitalize on the standard generics of the ICP mission, goals, and potential performance metrics from the SMART objectives can lead to diverse, uncoordinated, and unrelated duplications of these generic educational value activities. As such, all the critical qualitative surveys should be designed, developed, and aligned in tandem with each other to report on critical qualitative KPIs for comparatives and dive-down analyses. Recognizing this crucial step of the strategically aligned PASS contributes to the identification and development of performance analytics that can be used longitudinally or one-off analytics or comparatives across the Levels 1 to 5 dive-downs as necessary or as appropriate.
- ***Enabling the Performance Analytics system through Information Technology & Analytics Tools*** – Once the strategic and aligned PASS is designed and developed, the next crucial step is developing a high-powered IT-based performance management system. This system is central to the Planning, IQA & Accreditation that subscribes to the information-quality-planning trio for its DA empowerment through Planning and Quality Management Dimensional alignment in HEI (Teay, 2019) via an integrated electronic IQA system for performance management (Teay, 2019, 2021). The system should be complemented by Educational Data Mining (EDM) (Peña-Ayala, 2014; Nguyen et al., 2020; Chatti et al., 2014; Dahlstrom, Brooks, and Bichsel, 2014) through AI-enabled analytic tools or a more simplified statistical package. These should allow for dive-down analytics based on the data collected & collated, and processed within the SPMS to be used by all stakeholders for performance data analytics processing and reporting based on needs.
- ***Equipping Human capital with positive mindsets and analytical skills towards utilization and interpretational skills*** (Teay 2022) – While the empowered survey system and its enabling IT & AI are the hardware & software of the performance analytics system, it is the human capital capacity and capability that either help the ICP to move forward its

performance management capacity and capability or extinguish its drive towards success based on informed decision making through its performance analytics. It starts with organizational culture and mindset that positively embrace a performance management culture and analytics skillsets. Without this essential step imbued in the ICP organizational culture and a positive attitude towards looking at issues as "opportunities for improvements" rather than "weaknesses or negatively oriented retributions", the ICP is destined for mediocre performances.

Recommendations

Most ICPs' primary focus for the design and development of surveys is mainly on meeting the IQA & Accreditation requirements rather than seeing them as instruments for strengthening or discovering opportunities for improvement. This paper has propounded the re-design and re-development of the surveys into the PASS that produce & provide performance analytics to enable and support data-driven informed decisions. In the design and development of the PASS, it is critical in:

(1) ***Positioning Survey System within higher-order SPMS and Institutional Research Framework*** – The design and development of the critical survey instruments of SES, FSS, SSS, CSS, and ASS should be strategically aligned and guided by the ICP mission goals & SMART Objectives. It is because the performance metrics or KPIs are used as key performance measures of the performance management of the ICP. As such, the PASS should be placed within the higher-order SPMS of the Institution, which permeates the general performance management system at all levels of the ICP, to be used by all units as the main SPMS to process and produce aligned performance metrics. In the design and development of the SPMS, it should serve the primary purpose of the higher oreder Instituional Research framework as proposed by the newer Association of Institutional Research (2017) simplication of the IR farmework as (a) Identifying information needs of relevant stakeholders and their decision support needs by anticipating questions through reviewing of data, information, research & policy studies of all types of interanl & external stakeholders, (b) Establishing IR technical tasks to collect, analyze, interpret, and report data and information by understanding data availability to answer pressing questions about student access and success and institutional operations and the process by which previously unavailable data are collected and incorporating applied research methods & data analysis to provide information & performance analytics for data-driven informed decision making and interpretation of results ouypits & outcomes, (c) Planning and evaluating to include operational, budgetary, and strategic planning in which institutional research collaborates with other units at the ICP, state, governmental or related stakeholders & organizations, (d) Serving as stewards of data and information through an institution-wide data strategy and system, and most importantly (e) Educating information producers, users, and consumers as they are the human capitals critical to understanding & utilzation of the performance analytics relevant to their actions or decision making.

(2) ***Design & Development of Survey Instruments Strategic & Operational Alignment*** – Often forgotten is the primary purpose of the survey itself, and its construct measures design & development to ensure that it "measures what it is supposed to measure". They

are based on the aligned strategic mission, goals, and SMART Objectives as the defining & delimited parameters. In addition, rather than reinventing the wheel, highly similar constructs can be designed and developed to meet highly similar objectives across a few survey instruments. It provides the basis of comparatives & dive-down performance analytics across different Levels 1 to 5 depending on the case analytics requirements. The survey instruments' strategic and operational alignment is defined and guided by the strategic alignment of the mission, goals, values, and SMART Objectives as the critical component for strategic alignment across the ICP (Teay, 2022).

(3) ***Integrated SPMS's quality-information-planning troika*** (Teay, 2019) – Unfortunately, in most HEIs, the ICP quality & performance, information, and planning management systems are designed and developed independently of each other silos to meet specific needs. The system development should be through a holistic systems approach. They are highly related and interdependent systems. The system dynamics that all systems are made up of smaller related sub-subsystems are also interdependent. They all move towards the same strategic direction to accomplish the same mission, goals & SMART objectives of "Acting Locally and Thinking Globally through integrating organizational learning into system dynamics" (Senge and Sterman, 1990). The quality-information-planning troika methodology can be used to discover the critical areas of interrelatedness and interdependencies when developing the SPMS. It is highly critical for an electronic integrated SPMS to work in tandem to accomplish the aspired purpose of quality assurance, strategic & operational planning & its executions, and information management. They are ultimately the base of the ICP performance metrics and performance analytics pursuits.

(4) ***ICP Human-Information-Organization Capital Strategic Assets*** – The bottom line of all successful organizations is the foundation of the human-information-organization capital sets. These are unique to and are the organization's core competencies to mitigate the implementation of eIQA and advanced analytics imperilments and imperatives of its Human-Information-Organization Capital Strategic Assets development and management (Teay, 2021 and 2022). As noted earlier, there should be a positive extant ICP Organizational Culture and Mindsets as a data-driven organization. It should place the performance analytics as to the core requirements of informed decision making and the openness to recognize "opportunities for improvements" instead of an adverse and perverse perception that they are analytics to "find fault or weakness, and used as cause for punishments or retributions". It includes the human capital capacity and capabilities of the "users" to understand & utilize the information. It is achieved through critical and analytical skill sets. The aim is to "discover" the information as opportunities for improvements" as opposed to treating them as "KPIs to meet requirements" or "white elephant pieces to showcase performance without openness to innovations or improvements". It undermines improvements or innovations to issues and problems solutions. In addition, there is the human capital as "providers" who are the IT & AI tech-based talents who create & deliver information & analytics that can be understood and used by the "users" group.

In conclusion, the information as performance analytics, created and delivered to its electronic base, is only as good as the human capital of the users and providers. Another forgotten stakeholder is the "evaluators," i.e., the students, alumni, and employment market, who are so used to being "forced" to take surveys like FSS, CSS, ASS, and EMSS, all of which are taken lightly and as a "burden" and waste of time. A powerful institutional communication strategy is to ensure total

"positivity" awareness and understanding by all stakeholders of (1) users of the information and performance analytics, (2) technical providers of the PASS and its process, and (3) assessors of the surveys' aims & purpose, its beneficial feedback, and not as "just doing it as requested.

Conclusion

This paper has attempted to demonstrate that the typical plethora of surveys independently designed and developed to meet a specific purpose can be powered into a powerful performance analytics survey system (PASS) that brings about data-driven informed decisions. This is done through the illustrated key steps of (a) identifying and defining the fundamental guiding principles, primarily found in the mission, goals & SMART Objectives used to design and develop the survey instruments, (b) the design and development of constructs measures that are highly similar across the various survey instruments being identified and developed to ensure that they "measure what they are supposed to measure" and to ensure that they report on specific and generic performance metrics beyond the typical required KPIs, (c) the performance analytics allows for comparatives within and across groups of Level 1 across colleges in institutions, Level 2 across programs within a college, Level 3 across courses in a program, or a specific year or course groups, Level 4 across sections within a single course, and Level 5 all courses of a single instructor, (d) for more in-depth performance analytics across longitudinal studies periods of various dive-downs or within specific constructs, (e) with the bottom line, that the performance analytics are used to create a data-driven informed decision making culture to identify opportunities for improvements.

It also highlights that the powering of the PASS for performance analytics is contingent on the need to (a) create a data-driven, informed decision-making organization with an organizational culture of positive mindsets for improvements and innovations, (b) the need for an SPMS as the critical performance management system for all levels of the ICP, and that it is an integrated electronic system that capitalizes on the IT & AI tools to produce the performance analytics that is based on the firmly integrated and interdependent quality-information-planning troika, (c) the existence of a set of competent and proficient human capital as users and providers to fully understand and utilize the performance analytics proficiently and effectively to strengthen the ICP operations.

In conclusion, while performance analytics can be a boon, it can also be a bane to the ICP if the ICP does not fully realize the potential of the need for improvements and innovations for the future of its unit establishment success. As such, the ICP needs to determine its future to improve its student and societal outputs and outcomes. The choice of being a performance analytics "boon or bane" is in the hands of each ICP itself.

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Sense of Coherence and Academic Procrastination: Coping Strategies as Mediators

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ABSTRACT

Academic procrastination is commonly found among undergraduates in different countries. Studies showed academic procrastination could be relevant to personality. Nonetheless, no study has examined the relationships between a Sense of Coherence and procrastination among undergraduate students. Studies revealed associations between academic procrastination and coping strategies, academic performance and sense of Coherence, and sense of Coherence and coping strategies. However, no analysis has been found examining the mechanism that connects the three variables to students' academic procrastination. Using the personality-coping-outcome theory as a framework, the present study hypothesized that coping strategy is the mediator for the effects of a Sense of Coherence (SOC) on academic procrastination. 99 undergraduates were recruited using a purposive sampling method through an online survey. The results showed that a Sense of Coherence has a direct effect and is partially mediated by a problem-focused coping strategy for academic procrastination. The findings support applying the personality-coping-outcome theory as a framework to understand the mechanism associated with a sense of Coherence and academic procrastination among undergraduates. More actions could be taken to cultivate the Sense of Coherence among undergraduates and to improve the use of problem-focused coping, a possible strategy to reduce academic procrastination commonly found among undergraduates.

Keywords: Academic procrastination; coping strategies; Sense of Coherence; undergraduates; problem-focused coping

Introduction

Academic procrastination is commonly found among undergraduates in different countries. Zakeri et al. (2013) defined academic procrastination as an unwise behavior involving the postponement of academic assignments or functions throughout the process until the last minute or, even worse, until missing the deadline. Steel (2007) estimated over 75% of college students were academic procrastinators who usually did assignments, papers writing, or exam preparation when deadlines were close. Ferrari et al. (2005) also stated that 75% to 95% of students from the US, Australia, and the UK had academic problems with procrastination. Bakar and Khan (2016) reported that 79% of undergraduates in a university in Johore, Malaysia, could be categorized as procrastinators or severe procrastinators.

According to several reports, academic procrastination has negatively affected students' academic performance and psychological health. Regarding physical health, Sirois et al. (2015) reported that students with procrastination problems might experience sleep deprivation due to continual waking moments in between sleep. They found it challenging to sleep back again; thus, they felt unrest after waking up the following day. Regarding mental health, Beutel et al. (2016) revealed that procrastination projected negative relationships with psychological well-being and mental health, as procrastination would increase one's levels of stress and anxiety. Andangsari et al. (2018) researched 320 undergraduate students in Indonesia. Their findings suggested that academic procrastination positively correlates with emotional and social loneliness.

Regarding academic performance, Duru and Balkis (2017) recruited 348 undergraduate students in Turkey. The findings revealed that students' procrastination is associated with low self-esteem, academic achievement, and personal well-being. Morris and Fritz (2015) initiated a survey among 107 undergraduates from a university in the United States, and they detected a significant correlation between high procrastination levels and low coursework marks.

Academic Procrastination and Sense of Coherence

Academic procrastination can be relevant to personality. Zhang et al. (2018) recruited 1184 undergraduate students in China and found that academic procrastination is negatively linked to a person's self-regulation ability. Siah et al. (2019, 2021) also concluded that grit and external locus of control personality is negatively associated with procrastination among Malaysian undergraduates. Besides, Karatas (2015) scrutinized the relationship between procrastination and big-five personality among 475 Turkish undergraduate students. Their findings showed that academic procrastination is negatively related to the conscientiousness and extraversion of this group of undergraduate students.

However, to our knowledge, we did not find any studies examining the relationships between a Sense of Coherence and procrastination among undergraduate students. The claim has been further supported by Mayer and Boness (2011) in their comments that a Sense of Coherence has been

well-researched in various disciplines, such as psychology, sociology, and medical sciences, but very few in transcultural and educational work contexts. Lindström and Eriksson (2011) also contended that only a small amount of studies examined a Sense of Coherence, which was seldom promoted in an educational setting.

Sense of Coherence has been defined as a global orientation that expresses the extent to which one has a pervasive, enduring. However, emotional feelings of confidence steered from these: (1) the stimuli deriving from one's internal and external environments in the course of living are structured, predictable, and explicable (comprehensibility), (2) the resources are available to meet the demands posed by these stimuli (manageability), (3) these demands are challenges, worthy of investment and engagement of life that make sense emotionally (meaningfulness) (Antonovsky, 1987).

Some research was initiated to scrutinize the relationship between a Sense of Coherence and academic performance among undergraduates. Siddiqui et al. (2021a) recruited 110 undergraduate dental students in Malaysia, and they detected that a Sense of Coherence is effectively relevant to academic performance. Colomer-Pérez et al. (2019) surveyed 921 First-year students taking a program for Nursing Assistant certification in Spain. The findings showed that students with more robust levels of Sense of Coherence in the Nursing course were related to greater motivation to pursue something desirable. Eventually, they would obtain higher academic performance.

Since there is a positive relationship between a Sense of Coherence and academic performance, it is hypothesized that a Sense of Coherence will be negatively linked to academic procrastination. However, we did not spot any relevant past research in the literature review on the present study.

Sense of Coherence, Coping, and Academic Procrastination

The relationship between a Sense of Coherence and better academic performance can be related to coping strategies. According to the Transactional theory of stress and coping (Lazarus & Folkman, 1987), coping is a regular changing cognition of an individual's behavioral endeavor. The coping process will enable the individual to tolerate or manage oneself with external or internal demands perceived as taxing or beyond one's coping resources.

On the whole, a group of researchers further classified coping strategies into different categories with particular characteristics, and three prominent types of coping strategies were identified subsequently. The three most studied categories are namely problem-focused coping, emotion-focused coping, and avoidance coping. Problem-focused coping is also known as task-oriented coping. The individual will try to adopt problem-solving and decision-making skills, or directly approach the source of stress to alter or eliminate the stressful situation. Emotion-focused coping is also defined as emotion-oriented coping. The target will attempt to reduce or regulate psychological anxieties, sometimes just by altering the meaning of stressful events cognitively. This does not make the situation better (Baqutayan, 2015). Avoidant coping is a form of defensive

regulation in which individuals tend to neglect, distort or even escape from the stressful demand (Pour et al., 2016).

Meanwhile some studies have verified the associations between a Sense of Coherence and coping strategies. Mayer and Boness (2011) claimed that individuals with a higher level of Sense of Coherence possess higher confidence and can react to challenging situations more flexibly. Therefore, they manage to enhance coping strategies indirectly for a quality life. A sense of Coherence helps people to pay attention to their adapting or coping styles and causes them to remain healthy in distressing circumstances (Mayer et al., 2019).

Abu-Kaf and Khalaf (2020) conducted a study on 170 Arab undergraduate students. They found that a Sense of Coherence is negatively correlated with avoidant coping but positively reflected in active coping. Similarly, Konaszewsk et al. (2021) examined 632 Polish undergraduates and suggested that a Sense of Coherence is ultimately projected in task-oriented coping but negatively reflected in emotion-oriented coping.

Besides research claims on the associations between a Sense of Coherence and coping, some other studies also revealed the connection between coping and academic procrastination. Kandemir et al. (2014) investigated 374 undergraduates in Turkey. They found that academic procrastination relates to avoidant but discordantly correlates with active planning coping.

Similar research was done by Sirois and Kitner (2015). They surveyed 1003 undergraduate students. The findings showed that procrastinators used maladaptive coping strategies to escape negative emotions for a short period. Also, Gareau et al. (2019) recruited 258 students from a Canadian university. They claimed that students with higher levels of academic procrastination were more likely to use disengagement-oriented coping strategies, ultimately leading them to lower academic achievement levels.

Studies revealed that there is an association between academic procrastination and coping (Gareau et al., 2019; Kandemir et al., 2014; Sirois & Kitner, 2015), academic performance and Sense of Coherence (Colomer-Pérez et al., 2019; Siddiqui et al., 2021a), and lastly Sense of Coherence and coping strategies (Abu-Kaf & Khalaf, 2020; Krok, 2016; Yang et al., 2021). These findings may indicate there could be a mechanism that connects the three variables. However, to our knowledge, no study has been conducted to examine the mechanism.

The Personality-Coping-Outcome Theory may provide a framework to validate the relationship between the three variables. This theory proposes that personality influences one's adoption of coping strategies distinctively. In other words, when an individual encounters a stressful situation, their personality traits will determine the coping strategy they will apply. Eventually, the strategy adopted will affect the adjustment to deal with the scenario or experiences (Gallagher, 1996). Some studies reported that the mediating effect of coping styles influences personality and psychological outcomes. For example, a study surveyed 150 Malaysian undergraduate students found that coping strategy is a mediator for the effects of locus of control on procrastination (Siah et al., 2021).

According to another study researching 2357 secondary students in China, the results supported that the mediating effect of coping styles affects Big Five personalities. The findings also showed that coping styles partially or fully mediated life satisfaction (Xu et al., 2017). Moreover, a study investigated 412 Chinese undergraduates who studied introductory psychology and found that coping strategies mediated the effect of maladaptive perfectionism on depression (B. Zhang & Cai, 2012).

Aims of the Study

Based on the literature review, previous studies revealed an association between academic procrastination and coping (Gareau et al., 2019; Kandemir et al., 2014; Sirois & Kitner, 2015). Academic performance and Sense of Coherence (Colomer-Pérez et al., 2019; Siddiqui et al., 2021b), and lastly, Sense of Coherence and coping strategies (Abu-Kaf & Khalaf, 2020; Krok, 2016; Yang et al., 2021), we predict that similar associations will be found in this study. Importantly, as no study has examined the mechanism that associates the three variables, namely Sense of Coherence, academic procrastination, and coping strategies, we adopted the Personality-Coping-Outcome theory proposed by Gallagher (1996) as a framework. It aims to envisage that a coping strategy mediates the effects of a Sense of Coherence on academic procrastination. Aitken Procrastination Inventory (Aitken, 1982) was used to measure academic procrastination. This measurement is reliable and applied to undergraduates from Turkey, China, and South Korea. A shortened version of the orientation to life Questionnaire derived from the original SOC-29 developed by Antonovsky (1987) was used to measure the Sense of Coherence that the same author proposed. Lastly, Brief-COPE that was a shortened version of the original COPE Inventory developed by Carver (1997), was used to measure coping strategies. According to the review conducted by Kato (2013), this inventory is the most frequently used coping measurement.

The conceptual framework and hypothesis are as follows:

1. Sense of Coherence is negatively associated with academic procrastination
2. Coping strategies are related to academic procrastination
   2a. problem coping is negatively associated with academic procrastination
   2b. Emotion coping is positively associated with academic procrastination
   2c. Avoidant coping is positively associated with academic procrastination
3. Sense of Coherence is associated with coping strategies
   3a. Sense of Coherence is positively associated with problem coping
   3b. Sense of Coherence is negatively associated with emotional coping
   3c. Sense of Coherence is negatively avoidant coping
4. Coping strategies are mediators for the effects of Sense of Coherence on academic procrastination
   4a. problem coping is a mediator for the effects of Sense of Coherence on academic procrastination

4b. Emotion coping is a mediator for the effects of Sense of Coherence on academic procrastination

4c. Avoidant coping is a mediator for the effects of Sense of Coherence on academic procrastination

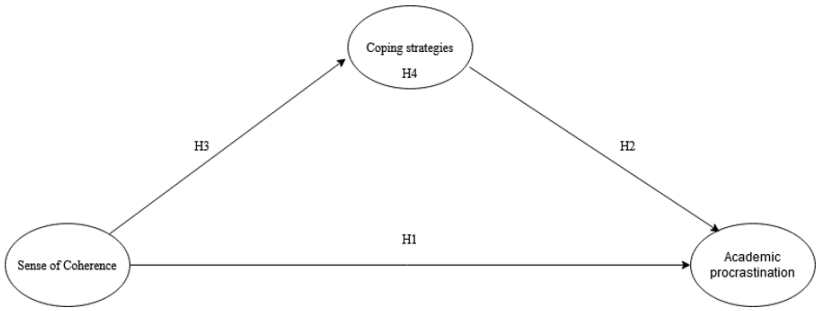

Figure 1: Conceptual Framework

Research method

Research Design

A cross-sectional survey in the research design was administered in this quantitative study. This design is a relatively faster and cost-efficient method that could measure exposure and outcome simultaneously, and thus the associations between these variables can be calculated (Setia, 2016).

Participants

We recruited 99 undergraduates between 19-24 years of (M=22.36, SD=1.28) to participate in the survey. Among them, 24.2% were males, and 75.8% were females. The sample size is larger than the estimated sample size of 85 calculated using the G*Power program (Faul et al., 2007), in which $f^2 = .15$, $\alpha = .05$, power= .80, and the number of predictors = 4.

Measurements

Demographic Information. Before responding to items in the questionnaire, demographic information of the targeted participants, such as their ages, gender, and nationality, was collected.

Orientation to Life Questionnaire. We used a shortened version of the questionnaire derived from the original SOC-29 developed by Antonovsky (1987). It consists of 13 items total, and five are reversed scored. Participants were asked to answer the items on a 7-point Likert scale (1= very rarely or never, 7 = very often). One of the sample items is "I keep my assignments up to date by doing my work regularly from day to day". Cronbach's alpha reliability ranged between .70 to .92 (Opheim et al., 2014). A higher mean score indicated a stronger Sense of Coherence.

Brief-COPE. Brief-COPE was a shortened version of the original COPE Inventory developed by Carver (1997). It consists of 28 items. Participants were asked to answer the items on a 4-point Likert scale (1 = I haven't been doing this at all, 4 = I've been doing this a lot). There are three factors tested: emotion-focused coping (10 items), problem-focused coping (six items), and avoidant coping (12 items) (Su et al., 2015). A sample item of emotional focus coping is "I've been getting emotional support from others"; for problem-focused coping, "I've been taking action to try to make the situation better"; and avoidant coping, "I've been giving up the attempt to cope". The Cronbach's alpha of the three coping strategies was .72 for emotion-focused, .84 for problem-focused, and .75 for avoidant coping (Cooper et al., 2008). A higher mean score indicates more frequent use of coping strategies.

Aitken Procrastination Inventory. Aitken Procrastination Inventory was ed by Aitken (Aitken, 1982). It comprised 19 items, in which nine items were reversed scored. Participants must answer the items on a 5-point Likert scale (1 = False, 5 = True). The Cronbach's alpha of the scale was reported as .89 (Kandemir et al., 2014). A higher mean score implied higher academic procrastination.

Procedure

After getting approval from the University Scientific and Ethical Committee, an online self-reported questionnaire was generated using Qualtrics online survey platform. Qualtrics online anonymous link was distributed through personal social networking sites, including WeChat, WhatsApp, Messenger, Instagram, and Facebook. The research applied purposive sampling to recruit participants. In the present study, the inclusive criteria are these: 1) The participants are undergraduate students, aged between 18 to 24 years old, 2) Malaysians, and 3) They are currently studying at universities in Malaysia. On the first page of the questionnaire, participants were presented with informed consent. They were informed of the study's purpose, their volunteer participation without coercion, and assurance of participant confidentiality. Participants were also notified that they reserved the right to withdraw from the study without any prejudice or penalty charge. In addition, participants were required to tick a box to ensure they had met the study's inclusion criteria. Only participants who had consented could progress to the online self-reported questionnaire. It took about one month to complete the data collection. Data were then extracted from Qualtrics for data analyses.

Data Analyses

Data cleaning was conducted first to examine the normality of the data. Next, the SPSS program was used for descriptive analyses, and lastly, the SmartPLS program was applied to analyze the partial least squares structural equation modeling to examine the hypotheses (Willaby et al., 2015).

Results

Data Cleaning

Skewness and kurtosis were used to examine the normality of perfectionism, coping strategies, and academic adjustment. The skewness and kurtosis values of all measurements are between -2.0 and +2.0 (Kim, 2013), so the normality of the data for all measurements is acceptable (see Table 1). No missing data was found.

Table 1: Skewness and Kurtosis of the Variables

Measurements	Skewness	Kurtosis
Academic procrastination	.11	.42
Emotion-focused coping	.09	.40
Problem-focused coping	-.63	.75
Avoidant coping	.33	-.47
Sense of Coherence	-.58	1.36

Measurement Model

Construct Reliability. One of the items in emotion-focused coping was removed as the composite reliability is below the recommended value of .7 (Hair Jr et al., 2016). The final composite reliabilities of all the measurements ranged from .73 to .89 (Table 2). Correspondingly, the findings suggested that the latent constructs of all measurements are acceptable.

Discriminant Validity. HTMT ratio was used to examine the discriminant validity. Henseler et al. (Henseler et al., 2015) suggested that an HTMT ratio above .85 can be regarded as low discriminant validity. As shown in Table 2, the discriminant validities of all measurements are below .85.

Table 2: Compositive and Discriminant Validities of all Measurements

	Total item	Composite Reliability	1	2	3	4
1. Academic procrastination	18	.82				
2. Emotion-focused coping	10	.78	.46			
3. Problem-focused coping	4	.81	.59	.81		
4. Avoidant coping	12	.78	.47	.61	.41	
5. Sense of Coherence	12	.75	.65	.49	.53	.64

Coefficient of Determination, Effect Size and Collinearity Statistics of Measurements. The results of the analyses are shown in Table 3. The variance inflation factor of all scales is also below 5, indicating no collinearity issue (Hadi et al., 2016). Besides, the results also reveal a large effect

size of the predictors on academic procrastination, R^2 = .42, and a medium effect size of Sense of Coherence on avoidant and problem-focused coping, R^2 = .18 (Cohen, 1992). The primary effect size among the predictors is from the Problem-focused coping on academic procrastination, f^2 = .15, and Sense of Coherence on the problem and avoidant coping, f^2 = .22.

Table 3: Coefficient of Determination (r^2), Effect Size (f^2) and Collinearity Statistics (VIF) of Measurements

Exogenous	Endogenous	r^2	f^2	VIF
Academic procrastination		.42		
	Emotion-focused coping		.01	1.63
	Problem-focused coping		.15	1.71
	Avoidant coping		.02	1.36
	Sense of Coherence		.12	1.52
Emotion-focused		.07		
	Sense of Coherence		.07	1.00
Problem-focused		.18		
	Sense of Coherence		.22	1.00
Avoidant coping		.18		
	Sense of Coherence		.22	1.00

Structural Model

Table 4: Results of the Structural Equation Modelling

	Hypothesis		Beta	Std Error	T value	P Values*
Academic procrastination						
Sense of Coherence → Academic procrastination	H1	-.34	-.35	.13	2.55	.006
Problem-focused → Academic procrastination	H2a	-.40	-.38	.12	3.30	.001
Emotion-focused → Academic procrastination	H2b	.04	.01	.15	.25	.400
Avoidant coping → Academic procrastination	H2c	.10	.13	.11	.92	.180
Coping strategies						
Sense of Coherence → Problem-focused	H3a	.43	.47	.10	4.24	< .001
Sense of Coherence → Emotion-focused	H3b	.25	.34	.19	1.36	.087
Sense of Coherence → Avoidant coping	H3c	-.43	-.47	.11	3.95	< .001
Mediating effect						
Sense of Coherence → Problem-focused → Academic procrastination	H4a	-.17	-.18	.07	2.41	.008
Sense of Coherence → Emotion-focused → Academic procrastination	H4b	.01	.02	.06	.17	.433
Sense of Coherence → Avoidant coping → Academic procrastination	H4c	-.04	-.06	.06	.79	.216
Control variables						
Gender		-.20	-.18	.22	.92	.179
Age		.02	.01	.09	.19	.423

Note: * one-tailed test

As shown in Table 4, after controlling gender and age, a Sense of Coherence is positively associated with academic procrastination, p = .006. Besides, a problem-focused coping strategy is

positively associated with academic procrastination, $p = .001$. Moreover, a Sense of Coherence is positively associated with problem-focused coping strategy but negatively associated with avoidance-focused coping strategy, $ps < .001$.

Mediating Effect. As shown in Table 4, only the specific indirect effect of a Sense of Coherence on academic procrastination through the problem-coping strategies is significant, $p = .008$. Besides, since the direct impact of a Sense of Coherence on academic procrastination is also substantial, $p = .006$, the result indicates a complementary mediating effect (Zhao et al., 2010).

Discussion

Academic procrastination is a common issue among undergraduate students. As studies have revealed the negative consequences of academic procrastination on academic performance, it is essential to find out factors relevant to academic procrastination to tackle the issue. Personality and coping strategies are two factors mentioned in past studies. However, no study has examined the relationships between a Sense of Coherence and academic procrastination and the mechanism that links these variables. Using the personality-coping-outcome theory as a framework, we predict that coping strategies mediate the effects of a Sense of Coherence on academic procrastination.

Firstly, the results showed that a Sense of Coherence is negatively associated with academic procrastination. These results are consistent with other past studies that claimed a positive association between a Sense of Coherence and better academic performance (Colomer-Pérez et al., 2019; Siddiqui et al., 2021a). Since academic procrastination is related to poorer academic performance, it is not surprising to find out that a Sense of Coherence is negatively associated with academic procrastination.

Secondly, the results also showed that a Sense of Coherence is positively associated with problem-focus coping but negatively with avoidant coping. These findings are robust as similar findings were reported by other studies conducted in other countries, such as in Arab (Abu-Kaf & Khalaf, 2020), China (Yang et al., 2021), and Poland (Terelak & Budka, 2014). Nonetheless, we did not find a negative association between a Sense of Coherence and emotional coping. This finding is different from the result claimed by Krok (2016) and Konaszewsk et al. (2021) in their studies on Polish participants. Both reported a negative association between Sense of Coherence and emotion-oriented coping. These differences could be related to the employment of different coping measurements. Therefore, future studies should use similar coping measures to examine the robustness of the findings.

Thirdly, the findings in the current study merely suggested that problem-focused coping is negatively associated with academic procrastination. These results are consistent with other past studies, concluding that engagement-oriented coping is negatively associated with academic procrastination (Gareau et al., 2019). Nonetheless, the results of the present study also showed that two coping strategies, avoidance, and emotional coping, are not relevant to procrastination. These

nonsignificant findings may be due to the two coping strategies, which do not involve actions taken as problem-solving coping and eventually resulted in the emergence of nonsignificant direct effects.

Lastly, the results also partially support the mediation hypothesis: Problem-focus coping is solely a complemental mediator for the effects of a Sense of Coherence on academic procrastination. In other words, undergraduate students with a higher Sense of Coherence are less likely to have the problem of academic procrastination. It is partially because of their use of problem-focus coping. These findings are consistent with the conceptual definition of Sense of Coherence: Individuals with a higher Sense of Coherence are more likely to manage, comprehend and understand the meaning of a stressful situation (Antonovsky, 1993); thus, they are more likely to use a constructive approach to examine potential resources in coping with the situation.

Conclusion

On the whole, the present study's findings suggest that both Sense of Coherence and problem-focused coping strategies are associated with academic procrastination. In addition, problem-focus coping is the mediator or the effect of a Sense of Coherence on academic procrastination.

Implication

In terms of theoretical implications, the findings support the application of personality-coping-outcome theory in academic procrastination. The theory may provide a framework to understand the mechanism associated with a Sense of Coherence, coping strategies, and academic procrastination among undergraduate students. In terms of practical implications, the findings suggest that academic procrastination can be tackled in two ways. Firstly, since a Sense of Coherence directly affects academic procrastination, the results indicated that more precautions should be taken to instill a Sense of Coherence among undergraduate students. For example, the university management may further create a conducive environment for students by giving more general resistance and resources for individual support and improving their self-efficacy (Mato & Tsukasaki, 2019), such as providing a formal health curriculum in the course structure, enhancing students' engagement with families and communities, and improving learning environment with more activities (Jensen et al., 2022). Secondly, since problem-coping indirectly affects the Sense of Coherence in academic procrastination, more workshops may be conducted to promote awareness of using appropriate coping strategies among undergraduate students. These workshops may include a school-based Yoga program (Frank et al., 2014) and cognitive-behavioral and mindfulness intervention (Mendelson et al., 2015).

Limitation

Extra caution should be taken in interpreting the findings in the current research. As we were using purposive sampling to examine the relationships among the variables, the findings may not be able

to be generalized to the whole population. Since the participants of the survey were from one of the universities in Malaysia, more studies recruiting different samples are needed to examine the robustness of the findings. Besides, as the research used a cross-sectional design, the researcher should be more vigilant when making a cause-effect explanation. Moreover, the findings of this study are based on a statistical model; as a result, it may not be able to meet the condition of cause-effect interpretation, such as the time-order relationship and the elimination of alternative causal explanations (Shaughnessy et al., 2015).

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Online Learners' Continuance Intention: A Theoretical Model

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ABSTRACT

Addressing the constraints of time, place, and the physical interaction of class in the face-to-face mode, it took the pandemic for schools to realize the power of technology to transform education. Higher education institutions forcibly shifted their approach to teaching and learning. However, given the novelty of the online platform, several unprecedented outcomes were observed that threatened students' resolve to continue in their respective given learning platforms. This paper attempted to understand online learners' continuance intention in an online learning environment through a theoretical model considering student-student interaction, student-instructor interaction, student-content interaction, course satisfaction, service quality, perceived value, and internet self-efficacy predictors. It established factors affecting online learners' continuous retention among higher education students in three HEIs in a major city of Southern Philippines. A modified questionnaire from Li et al. (2021) underwent validity and reliability checks. It was used to collect information from more than 800 business management college students through an online survey hosted by a professional online survey platform. Only eighteen years old and above students were allowed to participate in the study, given the instruction in the survey instrument. The theoretical model was established with causal-comparative research design, Structural Equation Modeling (SEM) via Amos 20 of SPSS 26. The study reveals that perceived value mediates the influence of course satisfaction and service quality on continuance learning.

Keywords: Course Satisfaction, Service Quality, Perceived Value, Internet Self-efficacy

Introduction

The power of technology to transform education has been a hot topic for over a decade. But it took the pandemic for schools to forcibly shift their approach to teaching and learning. The shift addressed the constraints of time, place, and the physical interaction of class in the face-to-face mode. Online learning allows flexible learning modes that let learners "freely select their learning paths" considering their actual conditions and benefit from contingent teaching (Moore et al., 2011; Li et al., 2021). The first few months of shifting have been difficult, although eventually, schools around the globe proved that online learning could be beneficial and engaging for learners (Cundell & Sheepy, 2018; Khan et al., 2017).

However, given the novelty of the online platform, several unprecedented outcomes were observed that made online instructional delivery quite challenging. A study was conducted on the online learning experiences of 1,641 college students in October 2020 by one of the higher education institutions of this current study. Results revealed some significant issues found to be both beneficial and unfavorable. It included some psychological aspects such as course delivery satisfaction and attitude, technological factors considering students' perception of the usefulness of their learning management system, and students' online competency. Social factors were identified more in their interaction with their teachers, peers, and the modules or learning materials prepared by their teachers (Liceo de Cagayan University [LDCU], 2020). Though the study was not formally conducted for the remaining units of the two HEIs, similar experiences were confirmed to have also been encountered in their respective institutions.

What factors could sustain learners' intention to continue their present academic engagement with their respective HEIs considering the availability of the gadgets and/or devices and the learners' satisfaction with the course delivery and the platforms used? Given the dynamics of digital technologies, understanding why learners intend to continue to use them or not in an online learning environment is important (Yan et al., 2021). Exploring factors that affect higher education students' intention to continue using information systems in their studies could benefit the institutions. This study hopes to contribute a broader understanding of online learners' continuance intention. It may guide higher education institutions to boost their current approaches for students to continue using technologies in their academic programs.

Framework

Continuance Intention. This study focuses on Bhattarcherjee's (2001) Information System Continuance Model (ISCM). Other theories are also mentioned to support the interplay of social, psychological, and technological factors with online learners' continuance and/or behavioral intentions. Bhattarcherjee's theory suggests that after the initial use of the technology, a user's satisfaction and perceived usefulness of an information system may change so that they either repeat the behavior or discontinue the use of the information system (Bhattarcherjee, 2001; Yan et

al., 2021). The theory of reasoned action (Fishbein and Azjen, 1975) is useful for understanding online learners' behavioral intentions toward online learning systems. Decisions to continue or discontinue the use of the students learning management system can be explained by the concept of Fishbein et al. (1975). The theory explains that people's behavioral intentions are influenced by their attitudes and beliefs. Online learners' continuance intention can be swayed by the interplay of attitudes, beliefs, intentions, and actions, which is central to this theory.

Citing Alruwaie et al. (2012), Li et al. (2021) explained that expectation confirmation theory is extensively mentioned in consumer satisfaction, purchase intentions, and brand promotion articles. Similarly, only when learners are satisfied with their course expectations will they continue participating in online learning activities can online learning also take part in its educational role effectively (Li et al., 2021). Additionally, in a Systematic Review of Literature (SLR) of 147 literature, studies identified potential antecedents of continuance intention, which were grouped into four main categories: psychological, technological, social, and behavioral (Yan et al., 2021). Psychological factors included satisfaction, attitude, perceived enjoyment, and trust. For technological factors, perceived usefulness and perceived ease of use were found to have a bearing on continuance intention. Likewise, according to Upton (2013), as cited by Yan et al. (2020), social aspects are more associated with interpersonal relationships and/or social structures and processes. Behavioral factors pertain to habits and other behavioral-related elements, such as frequency of use.

Considering the numerous antecedents of continuance intention identified by the previously mentioned systematic review, this study set its boundaries mostly on factors primarily identified in the results of a previous institutional study mentioned earlier among 1,641 college online learners. Presumed to influence online continuance intention were limited to psychological factors that indicate satisfaction and attitude and social factors that suggests student interaction with other students, instructor, and course content. For this investigation, the perceived value was considered a technological factor was referring to the perceived benefits indicating the usefulness of the learning management system. The behavior aspect was not part of this study since this needs another method of collecting data vis-à-vis more time to observe, such as habit, frequency of use, etc., which goes beyond the timeline of the present study.

Student Interaction. One of the most widely held starting points for discussions about online learning activities is Moore's theory of transactional distance work. It focused on clarifying the world of distance education and was one of the earliest theories related to computer-mediated instruction. He defined transactional distance as "a psychological and communication space to be crossed, a space of potential misunderstanding between the inputs of the instructor and those of the learner" (Moore, 1980). In this study, Moore's distance learning is qualified and limited to using Moore's term for online learning. After all, Moore's theories were also related to computer-mediated instruction, another form of online learning. Further, in this context, three types of interaction were distinguished: learner-content interaction, learner-instructor interaction, and

learner-learner interaction (Moore, 1989). The learner-content interaction is the *student-content interaction* (SCI) between the learner and the study material. In the online context, some of these interactions would mean the student's interactions with webpages, e-books, educational videos, and other media included in an online course (Moore, 1989; Xiao, 2017; Zimmerman, 2012). On the other hand, learner-instructor interaction is the second type and is described as *student-instructor interaction* (SII). It is the exchange between the student and subject matter expert who prepared the content or the person acting as the instructor. The learner-learner interaction is the third type, termed *student-student interaction* (SSI), and is reminiscent of the classroom discussions and group projects of traditional instruction. In distance education, Moore (1989) contended, this type of interaction takes place between learners through discussion board postings, online study groups, or computer-mediated chats (Moore, 1989; Sutton, 2001). Moore stressed the importance of including all three types of interaction for any distance learning course, regardless of the medium or media used. However, some studies indicated that the amount of interaction that learners have with the content is most important to student satisfaction in web-based learning, compared with learner-learner interaction and learner-instructor interaction (Chejlyk, 2006; Keeler, 2006, as cited by Kuo et al. (2013). Perceiving the delivery of the entire course can be related to student interaction and is contingent on the decision of the students to continue using the learning platform to pursue their respective courses.

Course Satisfaction. Bhattacharjee's expectation confirmation model assumed that users' continuance intention of information system use is affected by their satisfaction with their previous technology experience. Citing Kotler (1999), Yan et al. (2021) held that satisfaction is a person's feeling of pleasure or disappointment which resulted from comparing a product's perceived performance or outcome against his/her expectation. In the academic setting, this would refer to the satisfaction of students' experience using the learning information system. In this current study, course satisfaction refers to the feeling of pleasure or disappointment with the curriculum provided through the online learning management system of the institutions. Therefore, course satisfaction refers to the student's satisfaction with the extent to which the online learning service provides the course needed to improve their skills and high expectations on the reliability of the institution's course delivery with the learning platform used. With the ECM of Bhattacherjee (2001), students' course satisfaction is associated with the perceived value or the perceived benefits. Studies show that satisfaction with the information system used substantially affects continuance intention (Lu et al., 2010; Huang & Hsiao, 2012). In their research model, continuance intention explained more than 70 percent of satisfaction variance. Also, cited by Lu et al. (2019), Halilovic and Cicic (2013) revealed that perceived usefulness, confirmation, and support conditions are the main factors influencing users' satisfaction. Conditions of support can be described as how the course was delivered vis-à-vis service quality

Service quality. Another variable that links to learners' continuance intention is service quality, described as "a global judgment or attitude relating to the superiority of a service" (Parasuraman et al. 1985). In this current study, service quality refers to the support extended to the learners in

the online learning platform, such as giving users the necessary knowledge on the learning management system and providing excellent service and quick response to students' queries. Zeithaml et al. (1996) proposed that service quality is one of the main predictors of repetitive behavior intentions. The better the user perceives service quality, the higher the possibility of that user continuing to use the information system in the future. Hu et al. (2009) verified a positive correlation between service quality and continuance intentions. In addition, many studies have proposed that when users perceive that an information system provides perfect service, they will have a strong sense of satisfaction toward that information system and intend to reuse it in the future (Chiu et al., 2007; Chen, 2007; Roca 2006; Zheng 2012; Zhou 2013; Chiu et al., 2005). Egedigwe (2015) used Parasuraman's service quality model to measure the quality of service in an information system. Service quality was used to differentiate the instructors' perceived value and their satisfaction with the quality of the cloud computing system. Results revealed that some demographics could be sources of differentiating opinions on the perceived value of cloud computing. On the other hand, Vajrapana (2019) studied the effect of e-service quality on perceived value, satisfaction, and loyalty using confirmatory factor analysis. It was found that e-service quality had positive relationships with the dependent variables, one of which was perceived value.

Perceived Value. According to Zeithamil (1988), as cited by Zegarra et al. (2020), perceived value and continuance intention established the basis for conceptualizing perceived value. The authors describe it as the trade-off between perceived benefits and perceived sacrifice, thus, producing an overall assessment of the utility of a product or service. The perceived benefits refer to the advantages that users gain from the service. In contrast, perceived costs refer to the sacrifices made in this process (Kim and Gupta, 2007), such as money, time, energy, and mental transaction costs (Kaasinen, 2005). In this current study, the perceived benefits were indicated with the usefulness of the learning management system in gaining & improving one's skills and knowledge.
In contrast, perceived costs are implied by one's effort and other investments made to attain the goals of one's chosen course. In a study, students' expectations of the courses were considered perceived value before deciding to continue online classes, which strongly positively influenced online learners' continuance intentions. It further showed that perceived value is a mediator between continuance intention and course quality, service quality, and interaction (Li et al., 2020). However, in a conceptual model of consequences and antecedents of continuance intention framed after a thorough systematic literature review, Yan et al. (2021) contend that perceived value is a mediator. The model reflected mediators between the antecedents and continuance intention. It identified the information system's perceived value and perceived usefulness as mediators.

Internet self-efficacy. In this study, Internet self-efficacy refers to the belief in one's capability to organize and execute Internet-related actions required to accomplish assigned tasks (Eastin & LaRose, 2000). There are two reasons to include Internet self-efficacy as a predictor of online student satisfaction, eventually leading to continuance intentions. First, online learning relies on Internet delivery through various activities such as group discussions, collaborative projects, and

communication with significant others in the learning process (Roach & Lemasters, 2006). Technical problems while using the Internet may cause student frustration and dissatisfaction (Choy, McNickle, & Clayton, 2002**).** Thus, online learners must possess high internet self-efficacy to complete required tasks for an online course delivered through the Internet. Second, Internet self-efficacy, as one of the three self-efficacy constructs in web-based instruction, is less addressed than academic self-efficacy or computer self-efficacy. The impact of Internet self-efficacy on student satisfaction is scarce and inconclusive. Eastin and LaRose (2000) averred that Internet self-efficacy positively correlates with expected outcomes, including continuance intentions.

The discussed arguments pointed out the constructs that bear on continuance intention. Figure 1 shows the research model and explains the antecedents of continuance intention directly predicted by service quality, course satisfaction, student content interaction, student-instructor interaction, and internet self-efficacy but may be mediated by perceived value. Based on the literature reviewed, this study investigates the mediating effect of perceived value on the influence of student interaction, course satisfaction, service quality, and internet self-efficacy on the continuance intention of online users.

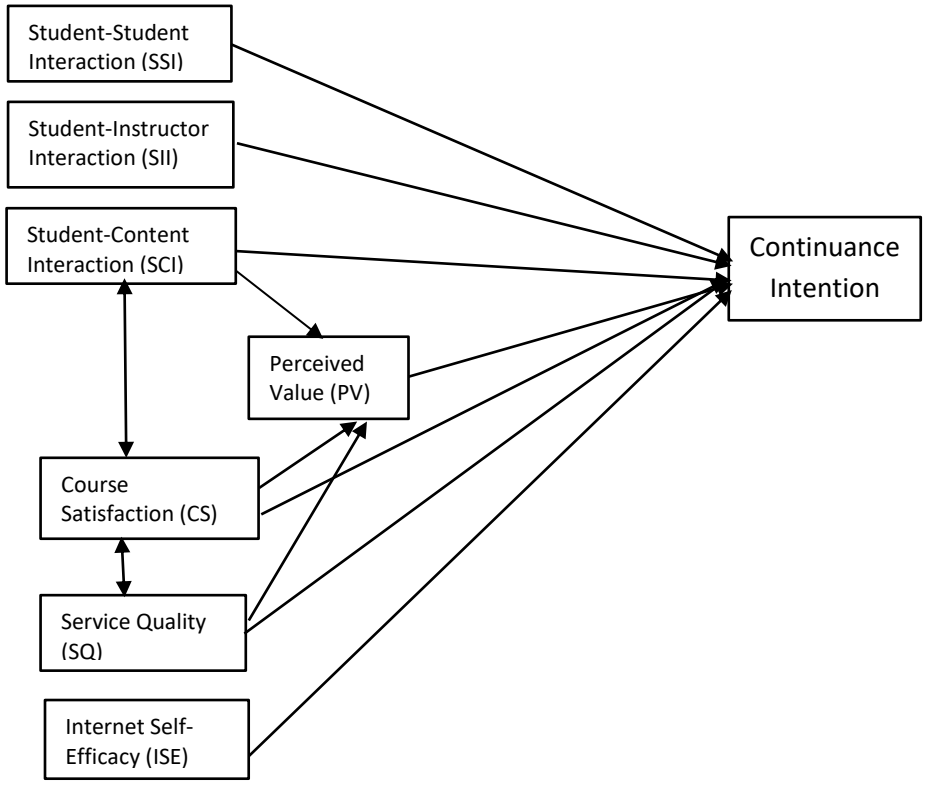

Figure 1. The Research Model

Hypothesis 1: Continuance intention can be predicted by student-student interaction, student-instructor interaction, student-content interaction, course satisfaction, service quality, perceived value, and internet self-efficacy.
Hypothesis 2: The influence of student-content interaction, course satisfaction, and service quality on continuance intention is mediated by the students' perceived value of the online learning system.

Objective of the Study

This paper attempted to understand online learners' continuance intention (CI) in an online learning environment given the selected variables through a theoretical model and established factors affecting online learners' continuance retention among business management students in three HEIs in a major city of Southern Philippines.

Methodology

This study was conducted in three private HEIs in Northern Mindanao, Philippines, and randomly participated in by more than 800 business management students. The Colleges of Business were chosen from among the three HEIs because, despite the pandemic, the colleges have fairly retained their enrollees. Data were collected between May-July 2021 with a retrieval rate of 70% through a partly modified instrument from the study of Li, Nishimura, Yagami, & Park (2021) entitled "An Empirical Study on Online Learners' Continuance Intentions in China." All the constructs from the said study were adapted, and another construct was integrated into the instrument. The constructs of this present study were found to be valid not only because of their theoretical support but also because the previous institutional research conducted by one of the HEIs pointed to these constructs as critical to student engagement in online learning. The five-point scale instrument was likewise content validated by teachers engaged in online business courses, supported by the existing literature of this present study. Reliability was conducted using Cronbach's alpha and was found to have acceptable internal consistency given the reliability coefficients. The constructs included student-student interaction (SSI) (α=.89), student-instructor interaction (SII) (α=.89), student-content interaction (SCI) (α=.90), course satisfaction (CS) (α=.93), service quality (SQ) (α=.91), perceived value (PV) (α=.92), internet self-efficacy (ISE) (α=.87), and continuance intention (CI) (α=.94). It comprised of 8 constructs and 32 related items with a 5-point scale, where 5 means strongly agree, 4 is moderately agree, 3 is agree, 2 is disagree and 1 is strongly disagree. The data collecting tool was designed based on the modified instrument and existing literature. From the agreement scale, the interpretation of the responses was based on the frequency of experience. This was distributed as an online survey hosted by a professional online survey platform through Google Forms. The questionnaire was organized using mean of the mean with the following scale response. Table 1 shows the scoring procedure.

Table 1. Scoring Procedure

Range	Responses	Interpretation*
4.67 - 5.00	Strongly Agree	Always
3.67 - 4.66	Moderately Agree	Often
2.67 - 3.66	Agree	Sometimes
1.67- 2.66	Disagree	Rarely
1.00- 1.66	Strongly Disagree	Never

*Source: Vagias, Wade M. (2006). Likert-type scale response anchors. Clemson International Institute for Tourism & Research Development, Department of Parks, Recreation and Tourism Management. Clemson University.

The study employed a causal-comparative research design. Furthermore, Structural Equation Modeling (SEM) via Amos 20 of SPSS 26 established path coefficients for further analysis of interrelationships of the constructs as advanced by the review of related studies and literature. Research results were presented by readings on Mediation and SEM as reported by Kenny, Kaniskan, and McCoach, (2014) and Kenny (2012). The estimation procedure utilized "model fit", "strength of the postulated relations between variables of interest", and "reliability of the parameter estimates."

Results and Discussion

Descriptives. Table 2 shows the descriptive data of the 839 students, including scale reliabilities, means, standard deviations, and zero-order correlations for all the study variables. The different scales were tested for internal consistency using Cronbach's alpha (α). As earlier presented in the Methodology, the α coefficient ranged from 0.94 to .87, which implies that the scales used in this study are reliable, measuring the constructs of what they intend to measure. Furthermore, Table 2 inter-correlations revealed that the constructs were significantly interrelated.

Table 2. Scale Reliabilities Means, Standard Deviation, and Inter- Correlation

Variable	α	$\bar{x}$	SD	1	2	3	4	5	6	7
1. Student-Student interaction (SSI)	.89	3.56	.79							
2. Student-Instructor interaction (SII)	.89	3.48	.76	.65**						
3. Student-Content interaction (SCI)	.90	3.23	.93	.57**	.75**					
4. Course Satisfaction (CS)	.93	3.34	.86	.58**	70**	.82**				
5. Service Quality (SQ)	.91	3.21	.87	.58**	.73**	.83**	.86**			
6. Perceived Value (PV)	.92	3.18	.91	.55**	.66**	.81**	.86**	.88**		
7. Internet Self-Efficacy (ISE)	.87	3.62	.73	.53**	.52**	.44**	.52**	.54**	.51**	
8. Continuance Intention (CI)	**.94**	**2.92**	**1.1**	.38**	.49**	.62**	.64**	.69**	.74**	.35**

Correlations (n=839); **Correlation is significant at the 0.01 level (2-tailed)

From among the constructs, *continuance intention* (CI) had a relatively widely dispersed response (SD=1.1). Since CI is the focus of the study, an emphasis on the descriptive data for CI can better understand the dispersed responses. Table 3 shows the descriptive data on the student response profile of the CI scale.

Table 3. Descriptive Data on the Responses Profile of Students on Continuance Intention

Range	Responses	Interpretation*	Frequency	Percentage
4.67 - 5.00	Strongly Agree	Always	78	9.3
3.67 - 4.66	Moderately Agree	Often	161	19.2
2.67 - 3.66	Agree	Sometimes	307	*36.6*
1.67- 2.66	Disagree	Rarely	201	*24.0*
1.00- 1.66	Strongly Disagree	Never	92	*11.0*
Total			839	100.0

The table shows that with a scale of 1 to 5, the mean scores of the students' responses were generally in the range of 2.67 to 3.66, which is interpreted as 'agree' or 'sometimes.' Except for Continuance Intention (CI), standard deviations, as shown in Table 2, were small, implying that most of the responses were similar and nearer to the mean and were good estimators of the population mean. The data also implied that the responses were in close agreement with each other and that the students' perceptions were most likely the same. However, the data show that CI has the lowest mean ($\bar{x}$ =2.92, SD=1.1) with a relatively higher standard deviation, implying that students' responses are highly dispersed with a standard deviation of 1.1. It implies that the CI responses of the business students from the three HEIs are not comparable.

The CI item loadings are: 1) I will continue to pursue courses online in the future, 2) I will recommend others to pursue learning courses online in the future, and 3) I will frequently pursue courses online in the future. The data further disclosed that generally, for continuance intention, 36.6% answered agree or 'sometimes' and more than one-third (*24% for disagree; 11% for strongly disagree*) rarely answered and 'strongly disagree' or never, implying that generally there are 293 respondents who strongly disagree and disagree about the possibility of continuing online learning. The 'agree' response can also indicate either wanting to continue sometimes or not implying ambiguity on this behavioral intention.

The authors surmised that the divergence might come from the varying learning platforms of the three institutions in this study; it may come from their status economically or geographically. It may also come from other demographics, which was established in Egedigwe's (2015) study that some demographics can be sources of differentiating opinions on the perceived value of cloud computing. These considerations were not part of the study's objective since the population's assumption was that the business student participants were currently using information technologies or information systems in their academic programs. Furthermore, in Table 2, inter-correlations revealed that these variables were significantly interrelated, an important procedure for initially testing mediation.

The Best Fit Model that Explains Continuance Intention

The first Hypothesized Model 1 states that *continuance intention can be predicted by the student-student interaction, student-instructor interaction, student-content interaction, course quality,*

service quality, internet self-efficacy, and mediated by perceived value was not acceptable with of X^2=10.62, which is more than the acceptable ratio, and the value of RMSEA (.105), which is also beyond the acceptable limits.

In finding the best fit model, items with no significance were deleted from the measurement model, as Awang (2012) recommended in his SEM Handbook. Thus, after a series of modifications, using string constraint parameters on regression weights estimates, a series of modifications were done using the parameters that resulted in finding the default model for Hypothesized Model 1.

			Estimate	S.E.	C.R.	P	Label	
PV	<---	SCI	.156	.029	5.328	***		
PV	<---	SQ	.539	.034	16.061	***		
PV	<---	CS	.344	.033	10.493	***		
PV	<---	ISE	.058	.023	2.566	.010		
PV	<---	SII	-.119	.029	-4.037	***		
PV	***<---***	***SSI***	***.004***	***.023***	***.189***	***.850***		***Not Significant***
CI	<---	SQ	.253	.074	3.442	***		
CI	<---	PV	.755	.066	11.385	***		
CI	***<---***	***ISE***	***-.052***	***.044***	***-1.189***	***.234***		***Not Significant***
CI	***<---***	***SSI***	***-.049***	***.044***	***-1.102***	***.271***		***Not Significant***
CI	***<---***	***SII***	***-.043***	***.057***	***-.760***	***.447***		***Not Significant***
CI	***<---***	***SC***	***.077***	***.057***	***1.347***	***.178***		***Not Significant***
CI	***<---***	***CS***	***-.092***	***.067***	***-1.372***	***.170***		***Not Significant***

Figure 1. Regression Weights: (Group number 1 - Default model for Hypothesized Model 1)

The figure shows that *student-student interaction* (SSI) does not significantly influence *perceived value* (PV); *continuance intention* (CI) is not significantly affected by *internet self-efficacy* (ISE), *student-student interaction* (SSI), *student-instructor interaction* (SII), *student content interaction* (SCI) and *course satisfaction* (CS). Thus, hypothesized model 2 was found acceptable in the set criterion.

Table 3. Results of the Calculation of Overall Model Fit Indices of the Hypothesized Model

Models & Fit Criterion	Absolute Fit		ncremental Fit				Parsimonious Fit
	RMR	RMSEA	GFI	CFI	NFI	TLI	X^2/df
Hypothesized Model 2	.008	.039	.997	1.00	1.00	.995	6.858/3 = 2.29
Standard Fit Criterion	*Nearing Zero*	*<.06*	*> .90*	*>.90*	*>.90*	*> .90*	*Ratio of X^2 to df ≤ 2*

Hypothesized model 2 confirmed that the influence of student-content interaction, course satisfaction, and service quality on continuance intention is mediated by the students' perceived value of the online learning system. Based on the standard criterion in Table 3, the second

hypothesized model was found to be the best fitting model given the values in Table 3 where the chi-square value (X^2= 2.29,); NFI, GFI, CFI, that were >0.90 and the RMR (0.008), approaching 0. The root mean square of approximation or RMSEA is 0.039.

Figure 2 shows the best-fit model with path coefficients. The figure shows the path diagram representing the structural equation model. *Perceived value* and *continuance intention* are endogenous (effect) variables, while *student-content interaction, course satisfaction, service quality,* and *internet self-efficacy* are the exogenous (cause) variables. It is also observed that *perceived value* is both a cause-and-effect variable. It further discloses that *perceived value* is the direct cause and bears the most substantial influence of *continuance intention.* Likewise, it is also the effect of *student content interaction, course satisfaction,* and *service quality.* The model further reveals that 55% of the variation in *continuance intention* can be predicted by *perceived value* and *service quality* as cause variables. On the other hand, 82% of the perceived value is explained by *student content interaction, course satisfaction, service quality, and internet self-efficacy,* or 18% cannot be accounted for and therefore can be potential in exploring further studies in determining other factors that may have a bearing on perceived value in the context of perceived benefits and usefulness of the online learning system used.

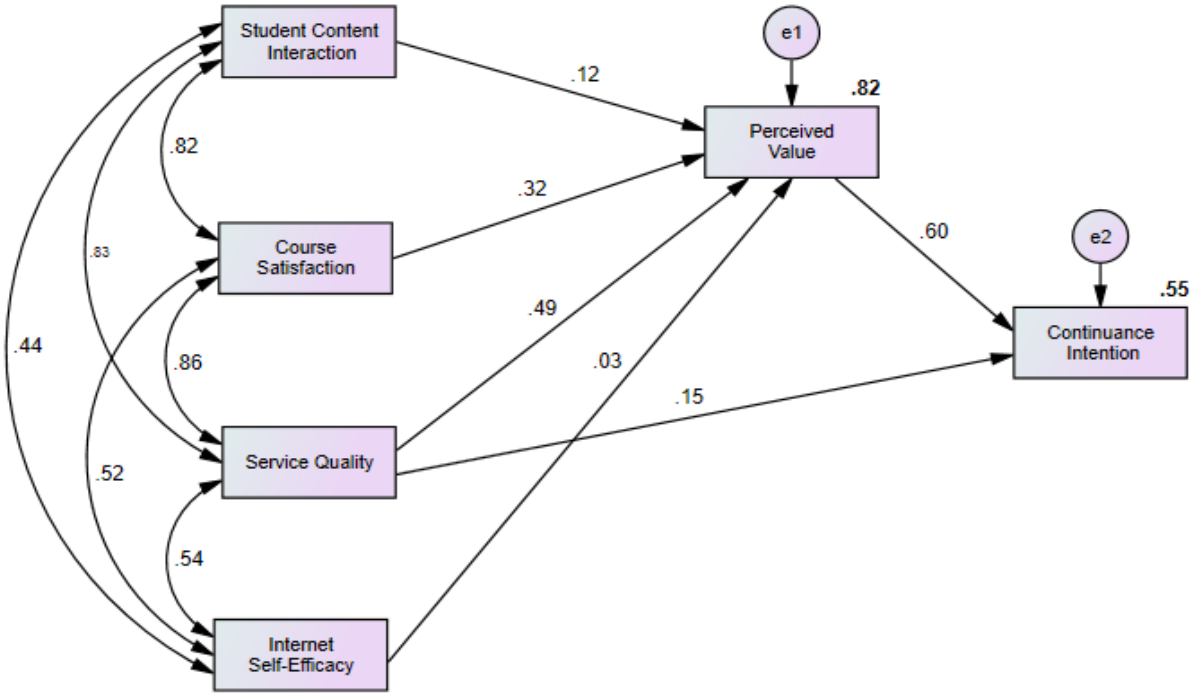

Figure 2. Hypothesized Model 2: The Best Fit Model

The structural equation for *continuance intention is* (CI = 0.60PV + 0.15SQ). It further means that 60% of the variation in CI can be explained by perceived value (PV), while 15% can be

explained by service quality (SQ). It further means that perceived value and service quality affect only 75% (.60+.15) of the students' behavioral intention to continue in their present learning management system, which comprises the 25% factor/s that may bear on continuance intention may be taken up in another study. For *perceived value, the* structural equation (PV = .49SQ + .32 CS + .12SCI + .03ISE). It likewise means that 49% of the *perceived value* (PV) can be explained by service quality (SQ), 32% by course satisfaction (CS), 12% by *student content interaction* (SCI), and 3.1% by *internet self-efficacy* (ISE). It is also important to note that student-content interaction covaries with course satisfaction (CVR =.82), and course satisfaction is also associated with service quality (CVR=.86). This means that course satisfaction is associated with student-course interaction as well as service quality. A correlation was also observed between service quality and student-course interaction (CVR=.83).

By its literature review, this study assumed that students' online continuance intention is directly influenced by the student learning interactions, their course satisfaction delivered through the IS, the perceived value of the online learning system, and their internet self-efficacy. However, initial assumptions were not confirmed. Instead, the perceived value was more influential in sustaining their continuance intention in using the online learning system to pursue their academic programs. This implies that perceived benefits on the usefulness of the students' learning management system outweigh student learning interactions, course satisfaction, and service quality in affecting the students' decision for continuance intention. The more they perceived the online learning platform was working to their advantage, the greater the chances for their continuance intention. For this investigation, the perceived value was considered a technological factor is referring to the perceived benefits indicating the usefulness of the learning management system. In a study, students' expectations of the courses can be considered perceived value before deciding to continue online classes, which strongly influences online learners' continuance intentions. Their study further revealed that perceived value is a mediator between continuance intention and course quality, service quality, and interaction (Li et al., (2020). The crafted conceptual model of the consequences and antecedents of Yan et al. (2021) shows mediators between the antecedents and continuance intention, including the perceived value and perceived usefulness of the information system used.

That perceived value can be strongly influenced by service quality and course satisfaction is also a finding of Egedigwe's (2015) study that used service quality to differentiate the instructors' perceived value and satisfaction with the quality of cloud computing systems. Another investigation studied the effect of e-service quality on perceived value, course satisfaction, and loyalty. Vajrapana (2019), in confirmatory factor analysis, found that e-service quality had positive relationships with the dependent variables, one of which was perceived value. Course satisfaction meant students' satisfaction with the quality of course delivery with the platform used. With the ECM of Bhattacherjee (2001), the perceived value or the perceived benefits is contingent on the students' course satisfaction. The findings of this present study cannot fully confirm the previous studies that revealed satisfaction with information system use has the most substantial direct effect

on continuance intention (Lu et al., 2010; Hsiao, 2012). It may imply that demographics such as students' use of gadgets/devices and economic and geographical considerations may be considered sources of differentiating opinions regarding the student respondents' desire to continue using technologies in their academic programs.

The theory of reasoned action (Fishbein and Azjen, 1975) clarifies that persons' behavioral intentions are influenced by their attitudes and beliefs. The theoretical model of this study explains that students' behavioral intentions to continue or not use their respective learning management systems are strongly influenced by their perceived value of the online learning system. It is likewise affected by service quality, course satisfaction, and student content interaction.

Conclusion

This paper explored understanding learners' continuance intention in an online learning environment through a theoretical model and established factors affecting online learners' continuous retention among higher education students.

Uncovered by this study are crucial dimensions of students' perceived value of the online learning system used by their institutions to stay in the program with their current online learning mode. Factors such as service quality and course satisfaction are primarily the influencing elements that shape the perceived benefits and usefulness of the information system used vis-à-vis perceived value which directly influences their intention to continue using the online learning system.

One notable conclusion is that the students' response to quit or not is ambivalent, with more than one-third of the sampled population rarely or never considering continuance intention, which poses a challenge to the institutions to explore other variables determinant of continuance intention.

It is also worth mentioning that the theoretical model generated in this study disclosed the need for further studies on plausible factors that may affect continuance intention considering that only 75% were accounted for by perceived value and service quality.

This study recognizes that two of the identified student-learning interactions, specifically, student-student interaction and student-instructor interaction, previously discussed as part of the assumptions, did not figure out significant dimensions of continuance intention. Perceived value was not affected by student-student interaction or student-instructor interaction. This study recognizes its limitation in that it could not explain this inclination. Thus, further research must be undertaken to provide insight into this matter.

Recommendations and Implications

The findings of this study elucidate several areas that future actions can address. It may do well for the institutions to review their current approaches to maintaining the efficiency and effectiveness of their online learning system, especially in delivering the course and ensuring optimum user satisfaction.

With the students' ambivalent response to continuance intention, it behooves HEIs to seriously study more on the variations caused by these answers to be more responsive and relevant. Thus, it is suggested that demographics such as students' use of gadgets/devices, economic and geographical considerations may be considered as causes of variation in their continuance intention. It likewise points to the need to expand the population study across other institutions' programs to increase the generalizability of the finding.

Since this study also recognizes the limitation to explaining the notable dimensions of student-student and student-instructor interactions to continuance intention, research may consider the vital student-student and student-instructor interactions effects on online learning and the quality of information systems in information systems in achieving online learning objectives. It may also apply to open innovation strategies to comprehensively understand its effects on online learning and open innovation performance. The study likewise admits the limitations of the variables that may have a bearing on continuance intention. Future studies may explore other variables, such as instructors' online pedagogy & system operation ability or diverse learning platform, to broaden the perspectives on continuance intention. Another future study may include the behavior aspect as an antecedent of continuance intention using the quantitative or qualitative approach or mixed method.

Philippine higher academic institutions continue to reinvent themselves innovatively to stay relevant during and even in the aftermath of the pandemic. While these efforts are laudable moves, it is likewise crucial for HEIs to take higher cognizance of the digital divide among its stakeholders. As the schools transitioned from the conventional mode of learning to online delivery, many students struggled not only in academics. Still, they were also constrained with their internet skills, access, and suitable gadget for their learning. If this phenomenon remains unattended, it may increase the learners' academic deficits and eventually backlash the whole educational system.

As online learning system is here to stay, HEIs must continue to ground their efforts to utilize the power of technology to transform education fully; address the issue of the digital divide to ensure that all can access the right to education; to understand further the dynamics of keeping students focused and nurture their desire to sustain the use of online learning system to pursue their academic aspirations.

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Experiences of in-service Ph.D. Scholars for undertaking Job and Study concurrently: A case from a Pakistani higher education institution

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ABSTRACT

The group of students undertaking work while studying in tertiary education is increasing due to various factors. Resultantly, such students may face various challenges hampering academic performance. Understanding their experiences during the negotiation process between study and work life would be immensely fruitful in facilitating working students. The study aimed to explore the experiences of in-service Ph.D. scholars for combining job and study simultaneously who were enrolled at the Institute of Education and Research, University of the Punjab, Lahore. It was a qualitative research study. A case study design was used to explore the experiences of in-service Ph.D. scholars. The study sample comprised ten in-service Ph.D. scholars and was selected using purposive sampling. The researchers used semi-structured interviews for data collection. Data analysis was done by identifying the relevant codes and themes. The result of the study revealed that the in-service Ph.D. scholars had no time for participation in their social life activities. They also faced health-related problems. The continuation of research and job simultaneously was the source of considerable stress and anxiety for Ph.D. scholars and significantly affected their academic learning and job performance. The study also documented and discussed the potential solutions to address such challenges leading to enhanced academic performance.

Keywords: Experiences, Higher Education Institution, In-Service, Job, Ph.D. Scholars, Pakistan,

Introduction

The group of students undertaking work while studying in tertiary education is increasing due to various factors (Christiansen et al., 2019). In recent years, the fee and financing for education have grown to such an extent that combining jobs and study may be necessary for many students (Curtis & Lucas, 2001; Curtis & Williams, 2002; Robotham, 2012). Accommodation and basic living costs also continue to grow yearly, forcing students to work during the academic year to fulfill financial needs (Stevenson et al., 2022). Some studies suggest that work can positively benefit students during study time and brings educational benefits. Watts and Pickering (2000) suggested that skills learned at the job are transferable, and students who have a job are more employable due to their development of organizational and time management skills. Working students were also said to develop good interpersonal and intrapersonal skills.

Globally, there has been a constant increase in the number of tertiary students working while studying (Owen et al., 2017). Many college and university students needed a job to pay for their studies and survive their lives. Most students do not have equal financial and economic needs as their university colleagues, yet more are doing their job. Their employment raised the main questions for policymakers that we could consider for all students. It was argued that this was inadequate because combining employment and education was mainly about founding individual freedom in the transition to maturity. Combining study and job became routine and the norm for most young and adult college and university students. In other words, dividing study and employment was no longer worthwhile or suitable (Lucas & Lammont, 1998).

The prevalence of students engaging in work and study concurrently can be attributable to various factors or reasons. A few of the percentage respondents were working full-time hours. There was a view that this was increasing among college and university students. Three key reasons seem to drive decisions to combine work and study. The first was financial because finance and money is the basic need for survival in the life of all humankind. The second was a wish to establish a bright future career. Thirdly, some students were interested in working almost full-time hours to qualify for the independent rate of youth allowance (McInnis & Hartley, 2002). Many societies/universities have allocated a specific educational budget by providing scholarships, but not all students have the privilege of getting them. Thus, concurrent engagement with work and study seems inevitable for many students (Faizuddin, 2018).

Students' employment usually refers to working students' characteristics and reasons for working during their studies (Robert & Saar, 2012). A strong tendency was that not only students from low-income families work during their studies, but also those who do not have financial problems. Some worked to gain practical experience and develop personal competencies, while some worked to earn money (Beerkens et al., 2011). While studying full-time, the students' jobs have been the subject of several scholars, academic workers, and researchers (Curtis & Shani, 2002; Neill, Mulholland, Ross, & Leckey, 2004; Watts & Pickering, 2000). The positives for full-time students undertaking part-time work have been noted and include the development of transferable skills to gain real-world experiences, such as team working, coordination, cooperation, and time management (Holloway, 2001; Wignall, 2007). McInnis and Hartley (2002) found that most in-

service students reported that their primary focus was not social life due to the busy routine of job and study. In this study, about 70 percent said they have no time for their social life activities, and 57 percent said they would not spend much time on social life and campus other than attending classes. In addition, part-time and full-time work can also contribute to testing, developing, preparing, and reflecting upon a particular career path and provide direct experience and a more direct route into desired employment (Billett & Ovens, 2007).

The workplace distribution system and work experiences during the study after graduation guaranteed successful entry into the labor market and provided a bright future in the form of a reasonable job, so there was no need to accumulate work experience to ease the university-work transition. Nowadays, financial motivation plays an essential role in student employment, but at the same time, new motivations have appeared. Moreover, motives can vary for students with different characteristics. Financial motivation can often be found among students from low-income families. The motives of students who work without considerable financial problems can be more heterogeneous, from the willingness to facilitate the labor market entry to the desire to fill free time and gain practical experience in the real world (Beerkens et al., 2011). Moreover, such students are more likely to have family responsibilities, increased financial commitments, and a heightened need to undertake paid work (Young, 2016). As a result of these personal and social factors, the percentage of working students is increasing every year (Tsurugano et al., 2021).

Apart from reasons to join work, there are multiple consequences of concurrently engaging in study and work. One more research concerned the issue of when students were employed: working during the first two years of studies has more negative effects on academic achievement than working later (Beerkens et al., 2011). The main conclusion was that part-time work might have no adverse effects on academic achievement, while full-time work negatively affects academic achievement. This assumption already meets some institutional responses, such as university 'job shops' in the UK, which are aimed at helping students find part-time jobs (Little, 2002). However, at the same time, in Little's work, such responses were presented as problematic because of the possible negative impact on academic performance. In some studies, student employment is compared to other types of extracurricular activity, such as leisure (Derous & Ryan, 2008).

Several studies demonstrated that the combination of full-time study and part-time employment might influence students' physical and emotional health and academic performance (Creed et al., 2015; Hovdhaugen, 2015; Stevenson et al., 2022; Yikealo et al., 2018). Salamonson and Andrew (2006) found that working for the job would adversely affect academic achievement and performance and create time management issues in the continuation of both study and job simultaneously. Significantly, Lillydahl (1990) found that students who said that part-time work had affected their academic achievement and performance spent more hours for work. Also, students who thought that part-time work had not affected their academic achievement and performance generally spent few hours for work or their work was related to their studies.

Many studies found that the longer hours students devote to employment, the less they involve in either academic or social activity (Fjortofy, 1995; Hailikari et al., 2021). Moreover, some other research has shown that part-time employment may cause dangers to students' health and safety.

In addition, it may have adverse effects on schooling and academic performance. The research constructed by O-Donnell and White (1999) revealed that students who spend more than 10 hours a week working have worse performance in learning and dangers to health than those who spend less than 5 hours a week or are non-workers. Paul (1982) suggested that the working experience of the undergraduates harmed their health and academic performance, and they faced time management issues and felt workload burden and stress. Darmody and Smyth (2012) also claimed that students working more extended hours experienced higher dissatisfaction with their academic workload. On the contrary, Kuh (1995) found that the working experience of college and university students might benefit their interpersonal capability, practical skills, cognitive complexity, knowledge, and academic skills.

Furthermore, the immediate and recent interruptions caused by COVID-19 may have impacted tertiary working students recently. A body of knowledge indicates that COVID-19 has resulted in significant employment shortages worldwide and increased stress for higher education working students (Qarajeh et al., 2020; Rawat et al., 2020). Covid-19 spread out, caused a loss of work for numerous students across the globe, and may increase especially financial stress. Stevenson et al. (2022) found that COVID- 19 did disrupt some students' opportunities for work, although the influence was less pronounced due to governmental policies and response. Tsurugano et al., 2021 asserted that the risk of working students losing their jobs due to the COVID-19 pandemic was far greater than the risk in normal working conditions, and job loss greatly impacted the studies and health of this group of students. Overall, the Covid-19 pandemic greatly influenced working students in different dimensions, consequently increasing financial insecurity among students and eventually affecting their studies.

Previous studies have explored the impact of paid work and research on academic and work life (Creed et al., 2015; Hovdhaugen, 2015; Robotham, 2012; Owen et al., 2017; Yikealo et al., 2018). Few studies explore concurrently tertiary students' experiences regarding study and work (Christiansen et al., 2019; Stevenson et al., 2022; Vicencioi & Banaag, 2019). Even minimal research focuses on tertiary students working and studying simultaneously in the Pakistani context. A better understanding of students' conditions on the part of the universities and instructors would lead to improved performance of students. Universities catering to working students should support these learners with faculty, administrators, facilities, modes of study, and fees that can foster success among them (Pema, 2005). Hence, in this context, the researchers undertake this study to understand the working students' experiences.

Moreover, in recent years enrolment of in-service people in Ph.D. has increased. Generally, universities have continued to treat these working Ph.D. scholars in the same manner as the majority of full-time scholars are treated. Most in-service Ph.D. scholars face issues related to social and personal life and the imbalance between job and study (Vicencioi & Banaag, 2019). Therefore, understanding tertiary students and their challenges would be quite helpful in tackling the barriers students face. Consequently, universities would be mindful of the conditions of their students, especially those struggling to create a balance between work and study. They should be accommodating and thoughtful when dealing with such students. In the given context, examining and exploring the experiences of doctoral students who work concurrently with their studies is

vital. There is a lack of research involving doctoral students in a local context, especially at the Institute of Education and Research. To adequately serve working Ph.D. scholars, universities must look beyond their demographic characteristics to see these individuals, their perceptions, social worlds, and experiences from their viewpoints. Consequently, this study was designed to explore the experiences of working Ph.D. scholars enrolled at the Institute of Education and Research, University of the Punjab, Lahore. Specifically, the study has addressed the following research questions:

- How do continuing study and job influence in-service Ph.D. scholars' lives?
- How far does study affect a job and vice versa?
- What organizational problems are being faced by in-service Ph.D. scholars during their Ph.D. studies?

Methods

Research Design

This study aimed to explore the experiences of working Ph.D. scholars enrolled at the Institute of Education and Research, University of the Punjab, Lahore. The study was exploratory, and a qualitative approach was applied. Generally, the kinds of research questions addressed by qualitative research approaches are frequently open-ended and exploratory, resulting in an enriched description of the studied phenomena (Burck, 2005). Moreover, a case study approach emphasizes how people interpret and make meaning of their experiences and the world they live in (Holloway, 1997, as cited in Gregory, 2020). A case study research design was used to explore the experiences of in-service Ph.D. scholars to help fulfill the aim of this research and obtain answers to the research questions. From a case study perspective, in-depth and detailed accounts of a particular phenomenon can be explored from the participants' standpoint (Ylikoski & Zahle, 2019). A qualitative design generally focuses on the meanings and interpretations of some specific phenomena from the individuals' standpoint while honoring the context of the study (Figgou & Pavlopoulos, 2015). Consequently, more in-depth and rich data were obtained for the study (Creswell, 2014).

Participants Selection

The study population was the in-service Ph.D. scholars enrolled at the Institute of Education and Research, University of the Punjab, Lahore. The study sample was 10 in-service Ph.D. scholars enrolled at the Institute of Education and Research, University of the Punjab, Lahore, and selected using the purposive sampling technique. Patton (2015) argues that individuals, groups, and settings are considered for selection if information-rich. The inclusion criteria are the Ph.D. students working while studying at the Institute of Education and Research, University of the Punjab, Lahore. This institute was selected due to several distinguished attributes: one of the oldest institutes in the region, comprehensive, and attractive for many diverse students from different distanced areas.

Table 1: Demographic Information of the Participants

Sr.	Gender	Job title	Teaching experience	Distance (KM): Campus to work place	Organization
1	Female	Lecturer	2	13	Public
2	Male	Lecturer	1	250	Public
3	Male	Head Teacher	8	130	Public
4	Female	Teacher	2	20	Public
5	Female	Lecturer	4	10	Public
6	Male	Lecturer	4	120	Public
7	Female	Lecturer	2	90	Public
8	Male	Teacher	6	160	Public
9	Male	Lecturer	4	15	Public
10	Female	Teacher	25	15	Private

Moreover, within the institute, students who had more experience and information about the issue were selected. Specifically, all participants (five female; 5 male) related to educational sciences and mainly worked in public-sector education institutions. Their working experiences varied from at least one year to 25 years. The distance between the study campus and the workplace ranged from 13km to 160km. The details of the 10 interviewees are presented in table 1.

Instrumentation

Case studies generally involve, among other aspects, face-to-face interviews or interactions with the research participants to gain an insider perspective (Islam et al., 2021). In this study, a semi-structured interview was developed as a research instrument. As a qualitative study, the objective is to capture students' lived subjective experiences, attached meanings, and understanding of phenomena-related experiences. One often-used data collection method is the semi-structured interview (Ylikoski & Zahle, 2019). This format is regarded as one of the ways to reach participants' subjectivity (Figgou & Pavlopoulos, 2015). The researcher sets the agenda based on their interests and topics but allows room for the participants' more spontaneous descriptions and narratives (Figgou & Pavlopoulos, 2015). In addition, Burck (2005) observed that several different considerations influence the construction of a research interview schedule. These considerations include the researcher's ideas about what is pertinent to explore in a specific area, what it is possible to elicit in an interview, and the kind of analysis employed.

The researchers developed the interview questions in light of the central aim and purpose of the study. During this process, the researcher can ask practical questions, listen, and interpret the responses. It also entails having a firm grip on the case study's issues and being able to approach the study reflectively and adaptably (Mfinanga et al., 2019).). The interview protocol was developed and validated based on these insights through experts' opinions. Given the instrument's purpose, opinions were sought to ensure that the elements included in the instrument are reflective and relevant to the construct of interest (Almanasreh et al., 2019). Therefore, the recommendations

were incorporated to make the instrument more representative and aligned. The central theme of the instrument was to explore the experiences of in-service Ph.D. scholars concerning involvement in studying and job simultaneously. Definitions of sub-themes are given as employed in the current study to guide the interview process.

- ***Feelings of In-service Ph.D. Scholars*** - How scholars generally experience the situation of undertaking study and job activities simultaneously.
- ***Fairness in Job and Study*** **-** Scholars' conceptions concerning the state of fairness experienced during doctoral study and job.
- ***Study and Job Effects*** **-** Feelings about the effect of studying on job activity and the effect of a job on doctoral study.
- ***Effects on Social and Personal Life*** **-** Experiences concerning simultaneous doctoral study and job affect scholars' lives' personal and social spheres.

Constraints and Suggestions

What are obstacles or barriers reported during doctoral education and relevant suggestion to improve the studying experience from a scholar's standpoint?

Various general questions are developed based on these broad areas to explore to guide the interview process and gain in-depth descriptions and views. Specifically, linking with these times, the following interview questions have been asked:

- How is your life, or are you being influenced by the continuation of study and job?"
- How far does study affect your job and the extent of influence job on your study?"
- What are the main departmental problems you are facing during your studies?"
- What recommendations or strategies would you suggest to constructively negotiate the situation of concurrently taking up work and study?

Data Analysis

The information sheet describing the study's purpose was given to each participant. Interviews were recorded and transcribed after receiving permission. A few questions regarding simultaneous engagement with work and study were posed to the participants. All interviews were personally conducted and recorded with the help of the facilitator. Interviews varied in length from about 20 minutes to 30 minutes. The interviews were open-ended and carried out in a conversational style. It may aid in maintaining the integrity of the participant's voice obtained through qualitative approaches such as in-depth interviews while providing a systematic, thorough, and relevant analysis (Gregory, 2020). The data were interpreted using the three-code method (Bailey, 2007). First, information was coded based on statements. Then initial coded information was categorized by placing similar assertions together. Finally, categories were then further refined into broader themes. To enhance the trustworthiness of the findings, both researchers independently interpret and analyze the interview information. This step is essential to know the credibility of the study. Afterward, analyzed data were matched to see the similarity or differences between the two

analysis sets. Overall, a broad range of agreements was found, and the difference was negotiated to reach valid conclusions. Now, the findings of this study have been presented and discussed following the study's research questions.

Results

The results of the study have been presented and described following the research questions of the study. The first research question was, "How are the in-service Ph.D. scholars' lives being influenced by the continuation of both study and job?"

Table 2: Themes Emerged From the Responses of the In-Service Ph.D. Scholars Regarding their Lives Experiences

Sr. No.	Themes	Frequency
1	No participation in social activities	8
2	Try to attend social activities	1
3	Participation in social activities	1
4	Personal life and health affected	7
5	Unable to perform personal responsibilities	4
6	No time for hobbies	3
7	Feel difficulties and burden	6
8	Feel stress and frustration	3
9	Problems in time management	3
10	Feel happy and motivated	3

Table 2 shows the life experiences of the in-service Ph.D. scholars. When the researcher asked the respondents about their social life experiences, most in-service Ph.D. scholars believed they had no time for participation in social activities due to the continuation of both studies and jobs. Whereas some of them reported that they tried to attend social activities, and some respondents said that they had time for participation in social activities. Consequently, most respondents have minimal time to participate in their social life activities.

When the researcher asked a question about their personal life, the majority of in-service Ph.D. scholars reported that their personal life and health were affected due to the continuation of both studies and jobs simultaneously. At the same time, some participants reported that they could not perform personal responsibilities, and some in-service Ph.D. scholars said they had no time for their hobbies. The majority of respondents also faced health-related problems.

When the researcher asked the question about the feelings of the in-service Ph.D. scholars in continuation of both study and job at the same time, about majority answered that they felt the burden and faced various difficulties in study and job. At the same time, some reported that they felt stress and frustration. Some said they had faced time management problems and some respondents feel happy and motivated. It was concluded that most respondents felt burdened and stressed and faced various difficulties in their studies and jobs.

The second research question was, "How far does a study affect a job and vice versa?"

Table 3: Themes Emerged From the Responses of the In-Service Ph.D. Scholars Regarding Effects of Job on Study and Vice Versa

Sr. No.	Themes	Frequency
1	Positive effects of study on job	1
2	Negative effects of study on job	6
3	Study has no effects on job	3
4	Positive effects of job on study	1
5	Negative effects of job on study	8
6	Fairness with study	2
7	Unfair with study	2
8	Try for fairness with study	7
9	Fairness with job	3
10	Unfair with job	1
11	Try for fairness with job	8

Table 3 depicts the responses of in-service Ph.D. scholars concerning the effects of a job on study and study on the job. When the researcher asked the respondents about the effects of the survey on the job, few respondents stated that the study had positive effects job. In contrast, the majority reported that studies have adverse effects on the job, and some answered that studies have no effects on the job. When the researcher asked the respondents about the effects of a job on the study, just a few participants responded that jobs have positive effects on the study, and the majority reported that jobs have adverse effects on the study. Thus most respondents have adverse study effects on job and likewise job on studies.

When the researcher asked the respondents about fairness in the study, some interviewees answered that they were fair with their study work, some of them were unfair with their study, and the majority of respondents tried for fairness with their study. When the researcher asked the respondents about fairness in their job, some respondents answered that they are fair with their job, whereas few are unfair with their job and the majority of in-service Ph.D. scholars try for fairness with their job. One of the respondents said, "I am not doing fair with my job because I shall have to leave my school work early to attend my Ph.D. class. In the same way, I am not doing justice with my studies because I do not visit the book library frequently."

The third research question was, "What are the departmental problems being faced by in-service Ph.D. scholars during studies?"

Table 4: Themes Emerged From the Responses of the In-Service Ph.D. Scholars Regarding Problems by their Department

Sr. No.	Themes	Frequency
1	No permission for study	3
2	Study leave not granted	3
3	Extra work load	5
4	No constraint in study by department	1

Table 4 illustrates the responses of the in-service Ph.D. scholars about problems faced at the department; some interviewees answered that their department did not permit Ph.D. study, and some reported that their department did not grant them study leave. One of the respondents said, "my department is not giving me study leave, and I have to face a lot of problems to go to study." About majority of in-service Ph.D. scholars reported that they have an extra workload from their department, and some reported that they have no constraint in Ph. D study by their department. It

was concluded that most respondents faced the problems of the extra workload from their department.

Table 5: Themes Emerged from the Responses of the In-Service Ph.D. Scholars or Suggestions to In-Service People to Do Ph.D.

Sr. No.	Themes	Frequency
1	Permission and study leave	7
2	Admission in distance learning and week end programs	3
3	Confirmation of job	1

Table 5 describes the suggestions of the in-service Ph.D. scholars to in-service people to do Ph.D. When the researcher asked the respondents about their proposals for in-service people to do a Ph.D., about majority of the in-service Ph.D. scholars suggested that they must avail of study leaves and get permission to study from their department. Almost some of them indicated that they get admission to distance learning and weekend programs for Ph.D. study, and about few suggested that they start Ph.D. after confirming their job. It was concluded that most respondents suggested that the in-service people must avail of study leave and get permission for Ph.D. study from their department. It was further elaborated that the in-service Ph.D. scholars emphasized the following themes: no time for participation in their social life activities and faced health-related problems. Moreover, other themes were generated from this study, feeling burdened and anxious, facing various difficulties in study and job, and adverse effects of job on study performance. Other themes emerged, unable to perform personal responsibilities, fairness with job and study, extra workload, time management issue, departmental permission, and study leave.

Discussion

The job orientation among university students is strong whether they are working to attain necessities or want to gain financial independence from their families. The researcher intended to investigate the experiences of in-service Ph.D. scholars and how in-service Ph.D. scholars were coping with both study and job. The experiences of the in-service Ph.D. scholars were explored through interviews. The findings of this study are discussed as follows.

The present findings of this study indicated that the majority of in-service Ph.D. scholars had no time for participation in their social life activities, and some of them devoted less involvement in their social activities due to the continuation of jobs and studies at the same time. The researcher could compare these findings with those of McInnis and Hartley (2002) found that most in-service students reported that their primary focus was not on social life due to the busy routine of job and study. Seventy percent said that they had no time for participation in social life activities, and 57 percent reported that they did not spend much time on social life and campus as well other than going to classes. Likewise, Fjortofy (1995) found that the longer hours students devote to employment, the less they involve in their academic or social activities. Moreover, the in-service Ph. D scholars face time management issues and feel workload burden and stress.

The further findings of this study pointed out that the in-service Ph. D scholars faced health-related problems. They were careless about themselves because they spent much time studying and working. Furthermore, they felt workload anxiety and faced various difficulties with their studies and jobs. The researcher could compare these findings with some other research O-Donnell, and

White (1999) revealed that students who spend more than 10 hours a week working have worse performance in learning and dangers to health than students who spend less than 5 hours a week or non-workers. Paul (1982) advocated that the students' working experience had a negative effect on their health and academic performance. Likewise, McInnis and Hartley (2002) explored that the counseling staff reported impacts on students' physical and psychological health that may lead to a decision to switch to study.

Furthermore, the findings of this study show that in-service Ph. D scholars feel burdened and anxious and face various difficulties in study and job, time management issues, and adverse effects of job on academic performance. The researcher could compare these findings with those of Lillydahl (1990) and Salamonson and Andrew (2006) found that working part-time can adversely affect academic performance and creates time management issues in the continuation of both study and job at the same time. Significantly, Little (2002) found that students feel that part-time work has affected their academic performance and generally work more hours. Further, Darmody and Smyth (2012) also claimed that students working more extended hours experience higher dissatisfaction with their academic performance, workload burden, and time management issue. On the contrary, Kuh (1995) found that students working experience was beneficial to their interpersonal competence, practical competence, cognitive complexity, knowledge, academic skills, and humanitarianism.

Conclusion

The study aimed to explore the experiences of in-service Ph.D. scholars. It was a qualitative research study, and interviews were conducted to explore the experiences of in-service Ph.D. scholars. It is essential to gain insights on the impact of undertaking work and study concurrently to understand how best to support them. Most in-service Ph.D. scholars have no time for participation in their social life activities and face health-related problems. Further, working students feel burdened, stressed, and anxious and face various difficulties in study and job.

Furthermore, it was concluded that most in-service Ph.D. scholars have adverse effects of study on job and job study, but they were trying for fairness with their job and study. They also encounter the problems of extra workload and time management issues. Overall the combination of study and job was a tough and challenging experience for Ph.D. scholars during their class workload. Therefore, after considering these conditions and providing support, the satisfaction and performance of working students could be improved.

Recommendations

Based on the findings and conclusion, the following suggestions are proposed for various research consumers/stakeholders to help working students balance their work and studies for better academic performance.

- To maximize the student's ability to learn, administrators should understand the impacts of labor burden on academic achievement, including physical and psychological influences.

It will probably increase the number of high-quality graduates. Fatigue and pressure from the workplace and campus are some of the constraint's student's encounter while working.

- The department/organization should grant employees study leaves and permission to study Ph.D. or higher education. Giving leaves will remove substantial pressure on students to focus solely on their studies. Government-related organizations already have a mechanism for leaves in place, but they tend to be reluctant to provide leaves due to various factors. Consequently, national policies should be transparent and explicit in granting study leaves.
- Recently, due to Covid-19, many institutions have developed online learning programs as an option for students. E-learning possesses a significant advantage in providing flexible learning schedules with enhanced learner control. Exclusively devoted institutions for E-learning are also available now virtually in all societies. In-service students may get admission, preferably to distance learning and weekend programs for Ph.D. to mitigate the adverse effects of undertaking work and jobs concurrently in the physical context.
- Institutions and instructors are encouraged to work with students to explore how they can simultaneously minimize the negative impacts on students involved in work and study. Universities shall be mindful of the conditions of their students, especially those struggling to create a balance between work and study. They should be accommodating and thoughtful when dealing with such students.
- Being a student and an employee also implies that stress is inescapable. As a result, rather than avoiding stress, learning to manage it is the best course of action. Take regular breaks, stay focused in class and work, eat sensibly, exercise, stretch, and perhaps go for a walk. Maintaining a healthy lifestyle assists people from walks of life deal effectively with stress.

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Trends of Corpus Linguistics Used in English for Specific Purposes Research: A Case of Asian ESP Journal

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ABSTRACT

This corpus-based study aims to investigate the trends of corpus linguistics used as a methodology in the English for Specific Purposes (ESP) research based on corpora of research article (RA) abstracts and conclusions published in the Asian ESP journal between 2005 and 2020. The findings reveal that 52 research articles out of 452, accounting for 11.5%, adopted corpus linguistics as a methodology. The number seems to be highest between 2011 and 2015 and tends to fall dramatically between 2016 and 2020. In terms of research approach, the corpus-based approach appears to outnumber the corpus-driven overwhelmingly. Swales' CARS model and study on research articles were strongly connected with corpus linguistics. However, the pedagogical application of corpus linguistics in the ESP domain appears to be underresearched. This study demonstrates how corpus linguistics can be applied as a research tool in trends investigation and contributes to the area of both corpus linguistics and ESP research.

Keywords: Corpus Linguistics; Corpus-based approach, Corpus-driven approach, trend analysis, English for Specific Purposes (ESP)

Introduction

According to McCarthy and O'Keeffe (2010), *corpus linguistics* becomes the common term known by linguists referring to the act of "searching through screen after screen of concordance lines and wordlists generated by computer software, in an attempt to make sense of phenomena in big texts or big collections of smaller texts" (p.3). A term *corpus* itself is defined as a body of texts collected from spoken or written sources which can be particularly of use to conduct a large-scale investigation of words in context, identify specialized vocabulary for more understanding, and build word lists for classroom use and autonomous study (Coxhead, 2013).

The applications of corpus linguistics are diverse. It has been applied to the empirical analysis of language and adopted in "language teaching and learning, discourse analysis, literary stylistics, forensic linguistics, pragmatics, speech technology, sociolinguistics, and health communication" (McCarthy & O'Keeffe, 2010, p.7). Using software tools in corpus linguistics facilitates the analysis of many searches. It offers "invaluable statistical information about co-occurrences, trends, tendencies, frequency, and distributions", making it a faster method than any other manual (Vo & Carter, 2010, p.305).

Two main approaches are applied in corpus linguistics research, that is, corpus-based and corpus-driven. According to Vo and Carter (2010), in the corpus-based approach, intuitions are placed first, and corpora are employed to test and validate them as sources of empirical data. On the other hand, in a corpus-driven approach, "corpora themselves are the data from which creative language uses are uncovered" (p.310). In other words, Tognini Bonelli (2001) defines the corpus-driven approach in the way that "observation leads to hypothesis leads to generalization leads to unification in a theoretical statement" (p.85), while the corpus-based approach is based on previously held beliefs or pre-existing rules.

English for Specific Purposes (ESP) research has also been revolutionized by the corpus linguistics approach, which has made it possible and convenient to investigate large sets of texts and has contributed to the generalizability of findings (Salmani-Nodoushan, 2020). In light of this, Lesiak-Bielawska (2015) mentions that corpus linguistics seems to have a lot to offer to English for ESP practitioners; for example, they can make use of mega-databanks which allows them to access authentic written and spoken discourse, and with the help of concordancing software, they can also develop specialized corpora, compare learner and expert texts, as well as examining the distribution of specialized grammatical and lexical features. Lesiak-Bielawska suggests that corpora have significantly provided numerous alternatives available to ESP practitioners and have raised the significance of research activity in the new forms.

As a result, the study aimed to examine the trends of corpus linguistics, including the extent and areas used in the ESP research context. The findings will significantly benefit graduate students, researchers, professors, and policymakers to follow the trends or fill the gap in the underrepresented areas. Furthermore, the study also helped demonstrate corpus linguistics's use in the trends investigating process.

Literature Review

Friginal and Hardy (2013) note that nearly all published research articles in the subfields of applied linguistics, such as ESP and English for Occupational Purposes (EOP), have highly become corpus-based, taking advantage of some forms of corpus analysis; nevertheless, corpus-based studies still are underresearched, particularly in terms of spoken discourse analysis. ESP and EOP studies on workplace discourses often focus on practical and pragmatic applications of communication patterns.

A corpus has also had an enormous impact in English for Academic Purposes (EAP) both in terms of direct (as a pedagogic tool) and indirect (as a reference and evidence) ways (Charles, 2013). Based on Charles's comments, corpora have contributed much to EAP in indirect use, especially in written discourse. Corpus-based approaches have become the norm in EAP, e.g., to describe specific features of academic discourse and its phraseology, reveal the characteristics of different disciplines and genres, examine recurrent word sequences, compile academic wordlists, and identify signals of moves and move boundaries. As for the direct application of corpus data with students, Charles identifies that research has recently also begun to focus on evaluating the effectiveness of direct corpus approaches and their acceptability to students, but there is a scarcity of work on the pedagogical applications of genre analysis.

The dominance of the corpus linguistics approach in written discourse is also pointed out by Johns (2013), who elaborates with solid evidence found in research studies submitted to the *English for Specific Purposes* journal (ESPj) and other research scenes. Similarly, Gollin-Kies (2014) conducted a study to compare research articles in two journals: *English for Specific Purposes journal* (ESPj) and the *Journal of English for Academic Purposes* (JEAP) published between 2003 and 2012 to examine the research methods most used and the research paradigms underrepresented in the field. The findings revealed that qualitative analysis of corpus based on written discourse was overwhelmingly found in both journals about frequency and distribution of linguistic or rhetorical features. Sa-ngiamwibool (2014) examined 70 articles in the *Asian ESP Journal* (AESPJ) published between 2011 and 2013, and the results of the study revealed that genre analysis and corpus linguistics were prevalent. The topics studied during this period primarily included lexical bundles in journalistic discourse and research article abstracts. Sa-ngiamwibool projected that corpus linguistics tended to continue its influence over the next decade. Salmani-Nodoushan (2020) notes that in the past two decades, most ESP practitioners and teachers have changed their research focus from theoretical issues to methodological and analytical studies on topics such as genres, corpora, and metadiscourse. According to Salmani-Nodoushan's analysis, corpus linguistics/analysis, discourse analysis, and computer and digital technology will continue to influence ESP research.

Methodology

While other research has already investigated the trends of general research methods in ESP-related journals using a manual approach, this current study concentrates explicitly on the trends

of corpus linguistics used as a methodology in AESPJ, based on the findings from the corpus analysis tool.

Most articles published in AESPJ are from Asia, Africa, and the Middle East. In addition, the journal's name indicates that Asia is the main target of this journal. Since both researchers in this study are in Thailand, it would be highly advantageous for Thai and other Asian researchers to observe the trends of international journals like AESPJ, which are the primary target.

This research adopts a corpus-based approach applying the previous research findings as a guideline in the investigation. The period of research publication was also expanded to cover the research articles published between 2005 and 2020, accounting for 16 years.

The research data was based on corpora of 446 research article (RA) abstracts and six conclusions published in the AESPJ between 2005-2020. Most texts in the corpora (N=446) were from RA abstracts which, as Sánchez (2018) suggested, are typically required by most journals to be included for publication. RA abstracts are considered a significant part of the RAs, acting as "an indicator of whether the research idea has been well established and disseminated" (Fatma & YAĞIZ, 2020, p.391). Most importantly, abstracts "offer preliminary notions about the research" (Sánchez, 2018, p.215). Hengl and Gould (2002) note that the "abstract should be short but give the overall idea: what was done, what was found and what are the main conclusions" (p.1). Despite its significance, abstracts were found missing in six research articles; therefore, the researcher decided to adopt the RA conclusion as the substitute, given that the RA conclusion's primary purpose is "to summarize the research by highlighting the findings, evaluating and pointing out possible lines of future research as well as suggesting implications for teaching and learning" (Ruiying & Allison, 2003, p.380). RA abstracts and conclusions represent the texts corresponding to the purpose of this study, that is, to examine the trends in research ideas and research approaches.

All available sixteen volumes of the AESPJ, published between 2005 and 2020, were retrieved from its official website. They were sifted through to extract only research articles (RAs). Forwards, company reviews, book reviews, and business articles were excluded. After that, 446 RA abstracts and six conclusions were then divided into three timeframes: 2005-2010 (6 years), 2011-2015 (5 years), and 2016-2020 (5 years). There were only six RA abstracts in 2005; hence they were included in the first period.

All RA abstracts were then transformed into plain text or *.txt* format, and a freeware *AntConc* (Anthony, 2004) was employed for data analysis. The search terms corpus and corpora were used at the concordance function to extract only research articles employing corpus linguistics as a methodology. Then the researchers checked the file names displayed in the next column, next to the concordance lines. All articles in which search terms corpus and corpora were found were then separated into three folders and three timeframes. Fifty-two articles from the selection process were then run again for trend analysis.

Results

Overall results

Based on the corpus data analysis, out of 446 RA abstracts and six conclusions published between 2005 and 2020 in the AESPJ, there are 52 research articles in which the search terms *corpus* and *corpora* were found, accounting for 11.5% when compared with the total number of 452 articles.

Table 1 The number of ESP research applying corpus linguistics as a methodology in the AESPJ between 2005 and 2020

Years	Total no. of articles	No. of articles with the terms *corpus* and *corpora*	Percentage of corpus articles compared with total no. of articles
2005-2010	58	9	15.5%
2011-2015	97	22	22.7%
2016-2020	297	21	7.1%
Total	**452**	**52**	**11.5%**

From Table 1, when divided into three timeframes, the number of articles that applied corpus linguistics as a methodology seems to be the highest (22.7%) between 2011 and 2015. It appears to be the least between 2016 and 2020.

The results correspond with Sa-ngiamwibool (2014) 's findings that corpus linguistics used in AESPJ articles was prevalent between 2011 and 2013. However, the trends seem to decline between 2016 and 2020, which may be concluded that Sa-ngiamwibool's (2014) projection of corpus linguistics' rising trends in the following decades seems incorrect.

Corpus-based vs. Corpus-driven

As discussed earlier, corpus-based and corpus-driven are the two main approaches adopted in corpus linguistics research. The corpus-based approach checks the researcher's intuition, while the corpus-driven approach is adopted with an open mind to see what patterns emerge (Tognini – Bonelli, 2001). When the terms *corpus-based, corpus-based, corpus-driven, and corpus-driven were searched in the corpus of 52 RA abstracts and conclusions, it appears that the corpus-based and corpus-based terms* overwhelmingly outnumber *corpus-driven* and *corpus-driven,* as presented in Table 2.

Table 2 Frequency corpus-based and corpus-driven in AESPJ between 2005 and 2020

Years	Corpus-based/Corpus base	Corpus-driven/Corpus driven
2005-2010	1	0
2011-2015	6	0
2016-2020	3	2
Total	**10**	**2**

Trends of corpus studies in AESPJ between 2005 and 2010

Based on Table 1, there are only 9 RA abstracts and conclusions in which corpus and corpora search terms were found during this period. The corpus contains 1,555 tokens with 559-word lists. McCarthy and O'Keeffe (2010) suggest that "small, carefully targeted corpora (by which we commonly mean corpora of fewer than a million words of running text) have proved to be a powerful tool for the investigation of special uses of language, where the linguist can 'drill down into the data in immense detail using a full armory of software and shed light on particular uses of language" (p.6). The corpus of these 9 RA abstracts and conclusions in this study has also been purposefully selected and was faithfully based on the corpus analysis.

The trends investigation in this study was grounded on top ten-word lists, and their collocates run on *AntConc* based on their frequency, as demonstrated in Table 3. Only key content words and one lemma occurring first in the list were selected. Content words refer to nouns, verbs, adjectives, and adverbs (Scott & Tribble, 2006). Function words or grammatical information were excluded since they do not carry meaning (Bortolato, 2016). Concordance lines were also rechecked for better comprehension. The same criteria were applied to selecting and analyzing word lists and collocates. The first word, *English*, emphasized the representativeness in which the researcher aimed to examine the trends of corpus linguistics in the area of *English* for specific purposes.

Table 3 Ten most frequent word lists and their ten most frequent collocates between 2005 and 2010

No	Word Lists	Collocates									
1	**English**	RAs	Native	Language	Business	Writers	Speaking	Published	Persian	Medical	Literature
2	**Study**	Present	Examines	Uses	Suggests	Reveal	Observational	Incorporated	Corpus	Consists	Case
3	**Research**	Articles	Writing	Medical	Tried	Texts	Published	Persian	Linguistics	Forty	English
4	**Corpus**	Data	Used	Study	Showed	Revealed	Relevant	Pilot	Parallel	Current	Based
5	**Articles**	Research	ELT	Selected	RAs	Experimental	Comprised	-	-	-	-
6	**Language**	English	Teaching	Student	Real	Figurative	comprehension	challenges	-	-	-
7	**Journals**	International	TESL	Swales	Persian	Medical	Local	Indicating	English	ELT	
8	**Persian**	Research	Professional	Made	Journals	English	EFL	Capitalized	-	-	-
9	**International**	Journals	Trade	Scale	English	Counterparts	Communications	-	-	-	-
10	**Results**	Support	Show	Practices	Obtain	Effective	Directly	Confirmed	-	-	-

The corpus linguistics approach applied in AESPJ during this timeframe may focus on analyzing *RAs* and native and *medical* discourse. Written texts may be an emphasis in this period since the word *speaking*, when checked with concordance, mainly refers to *native English speaking*, not spoken texts. The *Persian* language seems to be popular to be investigated together with the English language in the AESPJ in this period, as seen in Figure 1. *Literature* is another area that tends to be explored in this phase.

the use of metadiscourse elements in Persian and English research articles. The research
. The intralingual analysis showed that both Persian and English used interactive resources more
the academic genre. Compared with English, Persian capitalized on more interactive resources, which
English RAs written in English by Persian EFL writers rejected by international journals
of Persian RAs published in professional Persian journals of the same field in
to find out how English and Persian made use of metadiscourse elements, and
more interactive resources, which shows that Persian puts a premium on textuality at
compared with a parallel corpus of Persian RAs published in professional Persian journals
rentiating factors between published English and Persian research articles at the level of
in the two languages, English and Persian. The intralingual analysis showed that both

Figure 1 Concordance lines of 'Persian'

There is one *observational* study conducted on linguistic metaphors. The third most frequent word found in this corpus, *research*, still emphasizes the dominance of RAs in corpus studies in ESP in this period (See Figure 2). Pedagogical application is noticed from the collocates *teaching*, *ELT* (English Language Teaching), *TESL* (Teaching English as a Second Language), and *EFL* (English as a Foreign Language). Swales' CARS model is revealed in the corpus.

, allowing them to better understand published research articles and facilitating the process of
factors between published English and Persian research articles at the level of move
and facilitating the process of writing research articles for publication.
the discussion sections of applied linguistics research articles (RAs) from the perspective of
based study uses two corpora of 40 research articles selected from two TESL journals
metadiscourse elements in Persian and English research articles. The research tried to find
of the discussion sections of medical research articles. We obse group consisted of

Figure 2 Concordance lines of 'Research'

Trends of corpus studies in AESPJ between 2011 and 2015

Similar to results revealed in the first period, *English* is the first most repeated word in 22 RA abstracts and conclusions published between 2011 and 2015. *English* is strongly collocated with *American, Philippines, Native, Chinese Speakers, Proficiency, Abstracts, Vocabulary, University,* and *Tests*. According to the concordance, three varieties of English, namely American, Philippines, and Chinese, seem to be often investigated. RA *abstracts* and *vocabulary* may still be the research focus of corpus studies. *University* settings may be among the areas of research interest.

Table 4: Ten most frequent word lists and their ten most frequent collocates between 2011 and 2015

No	Word Lists	Collocates									
1	**English**	American	Philippines	Native	Chinese	Speakers	Proficiency	Abstracts	Vocabulary	University	Tests
2	**Corpus**	Based	Word	RA	Linguistic	Incorporating	Data	Containing	Annotated	Various	Tools
3	**Academic**	Writing	Words	Purposes	Register	World	Vocabulary	Various	Use	Typical	Texts
4	**Research**	Article	Business	Previous	Mathematics	Writing	Three	Studies	Space	Questions	Quantitative
5	**Study**	Examines	Aimed	Suggested	Shows	Reveal	Provided	Profiles	Present	Pilot	Lexical
6	**Business**	Research	Meetings	Word	Twenty	Specific	Purposes	Subjects	Students	Science	Register
7	**Lexical**	bundles	Verbs	Coverage	Word	Items	Competence	Vocabulary	Study	Students	Specific
8	**Word**	List	Corpus	Families	Academic	Million	Lexical	Four	Business	Top	Token
9	**Vocabulary**	Technical	Profiles	Learning	Active	Students	Specific	Specialized	Selected	participants	Online
10	**Writing**	Academic	Mathematics	Teaching	Student	Specific	Resemble	Research	Practices	Letter	Instructors

Research may appear to be highly corpus-*based* in this period (See Figure 3), and most of the corpora tend to be *annotated*.

(RA) methods sections. This paper reports a corpus-based analysis of the communicative move structure
overview of mathematics writing based on a corpus-based analysis of 410 refereed journal articles coverin
xical bundles were identified. Pedagogically, the corpus-based approach to the study of field-
words reported in this study by incorporating corpus-based concordance data into teaching materials, thereby
discourse community, as well as for incorporating corpus-based learning. Finally, the limitations and direction
This study is a corpus-based lexical study that is aimed at
moves, of this section, taking a genre-based, corpus-informed approach. With both self-developed

Figure 3 Concordance lines of 'Based'

As shown in Figure 4, academic *writing* seems to be highly interesting to researchers. This matches the findings in ESPj and JEAP previously conducted by Gollin-Kies (2014).

ogical implications are suggested for teachers of academic writing courses. Strategies are recommended for consciou
mostly used in the same way as academic writing in terms of structural distribution. As
nse popularity among linguists, hoping to inform academic writing instructors and advanced EFL/ESL writers
trajectories of the lexical verbs employed in academic writing of three Chinese novice science researchers.
and the development of lexical verbs in academic writing practices.Pedagogical implications are suggested
Acknowledgements are an indispensable part of academic writing such as print books, research articles,
for course design and materials development in academic writing through which learners are able to

Figure 4 Concordance lines of 'Writing'

Writing, Words, and *Purposes* seem to be associated with English for academic purposes (EAP). In addition, this period also focuses on academic *register* and *vocabulary* and is strongly linked with the analysis of the research *article* (See Figure 5). Hence, corpora seem to contribute much to EAP, per Charles' (2013) advice.

function of lexical bundles. A corpus of 200 research article abstracts by Iranian authors in the
to achieve a similar goal by analyzing research article abstracts in terms of the frequency
generic structure of different sections of the research article genre, including Research Article Introduction (R
ong members of various academic disciplines, the research article has gained immense popularity among linguists,
sections of the research article genre, including Research Article Introduction (RAI). Both disciplinary and subdisc
tool. The study investigated a corpus of 30 research article introductions, 10 English ones written by English
he structural organization of Chinese and English research article introductions in the field of applied
by Chinese. The results show that the research article introductions written by Chinese researchers exhi
While the ultimate purpose of a research article is to persuade the audience to
or apprentice writers to write a good research article (RA) abstract to publish in international
little previous research into the structure of research article (RA) methods sections. This paper reports
Research article writing has received a great deal

Figure 5 Concordance lines of 'Article'

In addition, *Lexical bundles* are primarily found in this corpus (See Figure 6). It proves Sangiamwibool's (2014) findings indicated that the topics between 2011 and 2013 mainly involved lexical bundles. It also confirms the interest of ESP researchers in the distribution of specialized grammatical and lexical features to study the authentic use in the actual context, which can be facilitated by using corpus linguistics as a methodology, as Lesiak-Bielawska (2015).

terms of the frequency and function of lexical bundles. A corpus of 200 research article abstracts
istribution of functional and structural types of lexical bundles and their probable relations as used
cture could possibly be realized through specific lexical bundles and vocabulary. This study examines vocabulary
unctions were described. The findings reveal that lexical bundles employed in journalistic materials are mostly
of the bundles also shows that the lexical bundles found in the Iranian corpus included
paper aims to investigate the use of lexical bundles in newspapers. It aims to shed
cific move structures, move-signaling words, and lexical bundles in RAs provide valuable information for
This study examines vocabulary use, particularly lexical bundles, in the introductions of computer science
reveal that Iranian authors use more 4-word lexical bundles in their writing compared to their
five-word, four-word, and three-word lexical bundles that reflect the specific rhetorical functions
assigned to these frequently used expressions is lexical bundles. This paper aims to investigate the
Daily were selected to form a corpus. Lexical bundles were identified with the use of
major moves, move-signaling words and meaningful lexical bundles were identified. Pedagogically, the corpus-based

Figure 6 Concordance lines of 'Bundles'

Trends of corpus studies in AESPJ between 2016 and 2020

In contrast with the findings in the previous two periods, *study* is the most repeated word in 21 RA abstracts and conclusions published between 2016 and 2020, which may be regarded as the norm of RA abstract writing. *English* is strongly associated with *language, native, relative, writers, variable, used, Turkish, teaching, spoken,* and *speakers*. There are two corpus-*driven* research articles; however, the researchers still favor corpus-*based* in this period. The *academic* area tends to focus on research implementation, particularly in the *academic promotional* genre. *The qualitative* corpus approach appears to be often employed.

Table 5: Ten most frequent word lists and their ten most frequent collocates between 2016 and 2020

No	Word Lists	Collocates									
1	**Study**	Present	Examines	Concludes	Aimed	Used	Tried	Seminal	Seeks	Provides	Models
2	**English**	Language	Native	Relative	Writers	Variable	Used	Turkish	Teaching	Spoken	Speakers
3	**Corpus**	Based	VNMC	Driven	Compiled	Word	Used	Thesis	Reveals	Qualitative	Lecture
4	**Used**	Frequently	First	Veterinary	Turkish	Study	RVs	Rarely	Qualitative	Predominantly	Nominalization
5	**Research**	Articles	Design	Terms	Related	Published	Publication	Process	Past	Little	Investigating
6	**Academic**	Writing	Promotional	Words	Purposes	Genres	Discourse	Word	Teaching	Spoken	Research
7	**Rhetorical**	Moves	Repertoire	Students	Questions	Occurring	Novice	Involves	Features	Examines	Eight
8	**Students**	Graduate	Novice	Journalism	Writing	Vietnamese	Undergraduate	Rhetorical	Postgraduate	Native	Made
9	**Words**	List	Including	Academic	University	Synonym	Running	Related	Pakistani	Occurring	Hold
10	**Analysis**	Genre	Collocational	Unveils	Thematic	Textual	Shows	Score	Resulted	Qualitative	Move

reporting the results along with their rhetorical configurations. This study discloses the impact
The rhetorical construction of discourse is constantly changing
impact of research design on the rhetorical conventions of students' F&D sections.
NNEWs the various functions and the rhetorical effects that RVs can have on
was carried out to explore the rhetorical features, i.e., occurrences, salience, and
showed that the most commonly occurring rhetorical move pattern and stance features for
in academic discourse analysis that involves rhetorical move patterns and metadiscourse stance features.
was an inappropriate usage of both rhetorical move patterns and stance features in
was carried out to analyze the rhetorical moves. Afterward, a bottom-up approach
on genre analysis to investigate the rhetorical moves and communicative functions of the
, the paper sought to identify the rhetorical moves and the functional constituent of
This study examines rhetorical moves and their linguistic realizations including
realizations. The findings demonstrated that the rhetorical moves and their constituent steps of
, verb function, and sentence voice. However, rhetorical moves considerably exemplified a variety of
most common in the corpus. All rhetorical moves have utilized verbs in this
verbal groups in experiential meaning. The rhetorical moves in the twelve (12) brochures were
findings, and non-standard configurations of rhetorical moves, indicating the students' novice rhetorical
This study examines the rhetorical moves of the NNES undergraduate students'
he communicative functions were determined. Eight rhetorical moves were identified and in terms
action or use classroom management or rhetorical questions. However, NES lecturers use more
to mediate the enhancement of students' rhetorical repertoire.
rhetorical moves, indicating the students' novice rhetorical repertoire. Meanwhile, the discrepancies influen

Figure 7 Concordance lines of 'Rhetorical'

Analysis of *rhetorical moves* and *repertoire* tends to be most often conducted (See Figure 7).

Most research in this period may appear to be linked with *graduate* students (See Figure 8) and *novice* researchers. The field of *journalism* tends to be the research focus in this period. Data analysis relates to *genre, collocation, theme, text, qualitative,* and *move.*

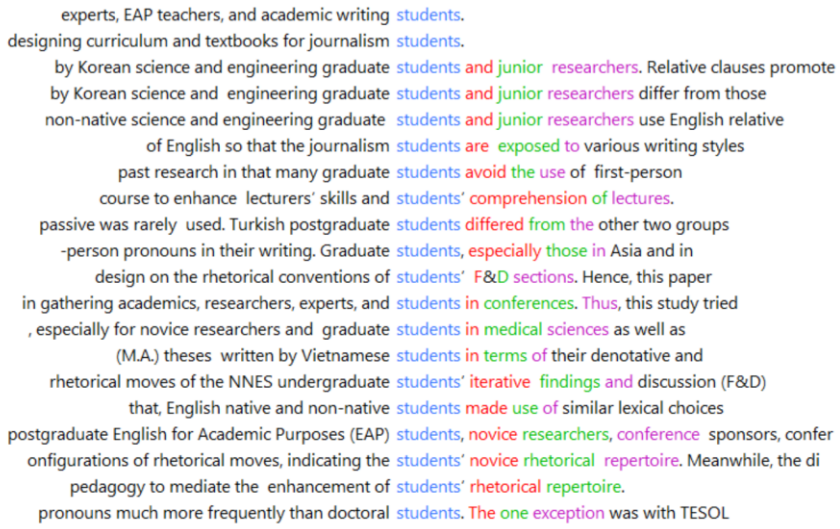

Figure 8 Concordance lines of 'Students'

Discussion and conclusion

The number of articles with the terms *corpus* and *corpora* seems to be highest between 2011 and 2015 (22.7%). The results correspond with Sa-ngiamwibool (2014) 's findings which indicate that corpus linguistics was prevalent between 2011 and 2013.

However, between 2016 and 2020, despite the high number of research articles published during this period (N = 297), the number of articles in which the search terms *corpus* and *corpora* were found tended to plummet (N = 21, accounted for 7.1%). It seems that ESP researchers might turn their focus to other methods. The results contradict Sa-ngiamwibool (2014) projection of rising corpus linguistics trends in the following decades.

The terms *corpus-based, corpus base,* outnumber *corpus-driven,* and *corpus-driven* imply that most researchers apply a corpus-based approach. Or it may be assumed that they reject the dichotomy between corpus-based and corpus-driven and call their research corpus-based. For example, McEnery and Hardie (2011) prefer to describe all corpus linguistics as a corpus-based approach. They argue in their book, "for those who accept it, the corpus-based versus corpus-driven dichotomy creates a basic, binary distinction, under which most works of corpus linguistic research can be sorted into one or the other group; however, the researchers' perspective rejects the notion that the corpus itself has a theoretical status, and thus also rejects the binary distinction between corpus-based and corpus-driven linguistics" (p.6).

Swales' CARS model was frequently mentioned, particularly between 2005 and 2010. According to Eak-in (2015), Swales' CARS model is "well-known and has been playing an important role in the analysis of academic texts and been applied widely to explore rhetorical structures of academic work and a part of research articles in various fields" (p.9).

In addition, the corpus research related to RAs seems prevalent in all three periods but tends to be most favorable between 2011 and 2015, including business and academic research. Nesi (2013) notes that "many ESP corpora are made up of research articles, partly because there is a long ESP tradition of research article analysis, dating from Swales' original work on article introductions (1981), and partly because research articles are readily accessible in electronic format and can easily be selected according to learners' specific disciplines and fields" (p.441).

Between 2011 and 2015, lexical *bundles* tended to be the favorite area to be examined, which corresponds with Sa-ngiamwibool (2014) 's findings. Still, the results in the corpus seem to be highly associated with research articles rather than journalistic discourse, as Sa-ngiamwibool suggested.

Corresponding with the trends in ESPj and JEAP, researchers in AESPJ also tend to prefer examining written to spoken texts. This might be because a corpus of written texts is much easier to build. In contrast, a corpus of spoken texts involves a highly labor-intensive process, including several difficulties in data collection (Bowker & Pearson, 2002).

The words related to language and nationality, such as *American, Philippines, Chinese*, *Vietnamese, Turkish*, and *Persian,* were also revealed between 2005 and 2020. Most words are associated with Asia, Africa, and the Middle East, confirming that most articles published in AESPJ were from these regions. The researchers were intrigued to investigate the use of English and their native language.

The pedagogical application of corpora focuses mainly on the first period between 2005 and 2010 and seems to be under-researched.

Implications of the study

This study demonstrates how corpus linguistics can be applied in trend investigation. It can then provide the applications of such a method for graduate students, researchers, professors, and policymakers. For postgraduate students, the corpus-based approach can be selected as one of the methods for identifying a research gap that can gather a large amount of data and reduce reading time. Researchers also employ trend investigation through corpus linguistics to visualize a research gap that needs further investigation. Moreover, in terms of data collection, this approach can be used to guard against criticism of cherry-picking, especially in a qualitative study. For professors, the corpus-based approach can be utilized as a pedagogical tool to promote students' analytical and critical skills since they are required to systematically manipulate a significant amount of data. Most importantly, the authority and policymakers can benefit from the results to gear towards the right direction and push more corpus linguistics research into the ESP domain.

Limitations and recommendations

Since the data of this study were limited to RA abstracts and conclusions, further studies may collect the data from the other parts of the study, such as research methodology and discussion, to obtain multidimensional perspectives. In addition, since this study collected the data from only Asian ESP Journal, further studies can compare trends of the Asian ESP Journal and other ESP journals in other regions. Finally, corpus linguistics for trend analysis should not be only employed for the ESP discipline but also for other fields of research.

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The outcome of using the Line app for English-speaking practice of Thai EFL students

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ABSTRACT

Fluency in speaking English is essential for communication, but it also brings success, from getting a job promotion to earning a higher academic degree. In this connection comes the consideration of language tool development for improving the spoken English of students. Of course, social messaging applications are one of the keys to increasing speaking proficiency in the 21st century, as they are instrumental and easily applied in teaching and learning. In Thailand, LINE App holds the number 1 position in the social networking app market. Its popularity is constantly growing, making most Thai people familiar with this application daily. In education, LINE App is usually selected as the first choice in many courses for not only giving students notifications about the courses but also being a space for students to consult with teachers and friends. LINE App also contains many essential features for communication, such as free voice and video calls, LINE Camera, LINE KEEP, etc., all of which can be used for language learning. The present study aimed (1) to examine the effects of using LINE App for English speaking practice on the students' English speaking proficiency and (2) to study the critical role of contributory factors triggered by the use of LINE App, such as motivation, levels of anxiety, self-confidence, and convenience in improving the students' speaking proficiency. The participants were 95 Thai undergraduate students in a public university in Bangkok. The data were collected from the pre-test and post-test, and interview responses. The comparison between the pre-test and the post-test reveals a marked improvement in the students' English speaking proficiency after four weeks of speaking practice via LINE App ($t = -23.79$, $p \leq 0.05$.). Considering the interview results, the students were highly motivated, confident, and less anxious while speaking English after receiving the English-speaking treatment via the LINE App.

Keywords: LINE App, English Speaking Proficiency, Contributory Factors, Social Messaging Applications

Introduction

Under the AEC (ASEAN Economic Community), being highly proficient in spoken English is one of the critical factors in getting the most benefits for regional entrepreneurs. With a higher level of English speaking proficiency, entrepreneurs can make a good bargain and bring a lot of advantages to the region. In Thailand, a higher level of English speaking proficiency is required in various work sectors, so staff members who speak English with customers, employers, and colleagues are usually well paid (Boonpattanaporn, 2014.) Unfortunately, a considerable number of Thai people have low English language proficiency. As indicated by the world's most prominent ranking of countries by English skills, Thai people's English was ranked 74 out of 100 developing countries in 2019 (EF Education First, 2019.)

In education, limited English speaking proficiency is a significant obstacle for many Thai EFL students. Many Thai students cannot speak English fluently because it is neither their official nor second language. Thus, they do not have many opportunities to speak English in any English-speaking environment (Ratanapinyowong, Poopon, and Honsa, 2007.) Furthermore, many students have several reasons for not speaking English, such as being afraid of making errors, fear of teachers, being embarrassed when their classmates laugh at them while speaking incorrectly, low levels of confidence, insufficient vocabulary knowledge, unable to speak fluently, unreachable goals like speaking like a native speaker, having a negative attitude toward one's language ability, and gestures and negative attitudes from teachers (Dincer and Yesilyurt, 2017.)

As stated above, since English-speaking fluency is essential for various purposes, many teaching methods have been developed and implemented in classrooms. Among the many techniques available, mobile technology best fits students today because it allows them to study without time and space constraints. Specifically, smartphones can be a part of learning success nowadays. Students are usually exposed to communicative interaction through various smartphone functions (Stockwell and Hubbard, 2013.) On smartphones, they can make a voice call or video call to their friends and teachers. They can even text, chat, and discuss with more knowledgeable people, like influencers who teach English online.

Furthermore, according to previous studies, some smartphone functions have been proven effective in teaching the English language. Gromik (2012) found that Japanese students could use the video recording function of their smartphones to make short English monologues. Sandberg, Maris, and de Geus (2011) found that young Dutch students learned English vocabulary better on GPS capabilities.

Concerning smartphone advances, one of the programs that seem more essential for learning over others is social messaging applications such as KakaoTalk, LINE App, WhatsApp, ChatON, Tango, and WeChat. These applications can potentially assist students in learning foreign languages and facilitating communication with teachers and friends through text, voice, imagery, or video (Pollard, 2015; Racoma, 2012; Yap, 2012; Yeung, 2013.) Additionally, previous studies found that using social messaging applications effectively supports English language learning.

Bensalem (2018) studied the development of English academic vocabulary knowledge of the students in the Arabian Gulf Region. The students were divided into the WhatsApp group and the traditional learning group. The results showed that the WhatsApp group outperformed the traditional learning group. Most participants found WhatsApp effective in enhancing their English academic vocabulary knowledge as it could motivate them to learn more vocabulary than in the regular classroom. They claimed that learning vocabulary through the application was flexible in time so that the assignments could be done to their satisfaction. Ta'amneh (2017) explored the English language learning achievement of the first-year students enrolling in Badr Community College at Taibah University, Saudi Arabia. The study focused on speaking and reading skills on weather and geography topics. The participants were divided into two groups: the experimental and the control groups. The results showed that the experimental group with a combination of WhatsApp and the traditional way significantly outperformed the control group taught only in the conventional way. The mean of the former in the post-test was (13.47), while that of the latter was (10.10.) Adding to this, according to the survey results from 300 students at King Saud University, after using WhatsApp for learning practice, most of the participants found WhatsApp effective in supporting their English language learning. They claimed that the application significantly boosted their language learning, confidence, positive attitude, and motivation as it was an authentic communication space. Most participants also highlighted integrating WhatsApp with educational technology to create a meaningful student experience (Alqahtani, Bhaskar, Elumalai, and Abumelha, 2018.)

Besides WhatsApp, another popular instant messenger is KakaoTalk. Recently, Kakao Talk has been used as a tool to support learning vocabulary, pronunciation, and Korean culture (Baek, Yoo, Lee, Jung, and Baek, 2017). The purpose of this study was to explore the development of the students in pronunciation, the use of vocabulary, and the study of Korean culture focusing on a language exchange in KaKaoTalk. There were 14 participants: the first half from a Korean language course and the other half from an English intensive course. They were asked to participate in a one-hour session class: the first half hour in Korean and the second half in English. All the participants found the language exchange activity through KaKaoTalk helpful for learning Korean and English vocabulary, pronunciation, and culture. The students from both courses had an excellent opportunity to exchange language knowledge and learn new Korean and English phrases. However, the students preferred face-to-face learning over instant messaging, like KakaoTalk. For this application, the students liked only the start of the session. The researchers also suggested that for those interested in integrating instant messenger applications into any language course, features of instant messengers such as voice recording and video should be included because such a combination is conducive to better pronunciation. Teachers should also send videos teaching learners the correct pronunciation of vowels and consonants via instant messengers (Baek, Yoo, Lee, Jung, and Baek, 2017.)

In Thailand, the most popular messaging application is LINE App. Thai students use this application on their smartphones, tablets, laptops, and other digital assistants to do their assignments and communicate with friends daily. In terms of second language acquisition theories, features of LINE App that support language learning correspond with the eight essential factors for constructivist pedagogies as follows (Vygotsky, 1978):

1. Social negotiation and mediation are involved in learning. Students can quickly negotiate with the teacher to find solutions to their learning problems on the LINE App.
2. Students can request to study the lessons of their interest on the LINE App.
3. The teacher acts as a guide or a facilitator and can provide students with access to various resources on the LINE App.
4. Learning should take place in an authentic environment. As the LINE App is widely used by Thais daily, this application is like training for students to know how to apply knowledge for use in the real world.
5. The teacher should provide and encourage students to learn a variety of perspectives and content. LINE App allows students to consult or talk with classmates and teachers, allowing them to understand various perspectives.
6. Content and skills should be relevant to the students' prior knowledge. LINE App can be a scaffolding to encourage students to review prior knowledge and learn new things.
7. As the teacher can easily stay connected with students on the LINE App, students can be assessed constantly. The teacher can use those formative assessment results to improve their teaching methods.
8. Students should be encouraged to be self-regulatory, self-mediated, and self-aware. The distinctive feature of the LINE App is its convenience, learning without time and space constraints. This characteristic promotes self-access learning as students can focus and monitor their studies.

Apart from the above-stated, the LINE App helps students answer questions faster than giving answers on paper because of the high-speed internet today; this increases students' motivation (Wee, 2013.) Moreover, instead of typing words, teachers can use virtual stickers, emojis, and emoticons to cheer students while students can do the same thing to other students (Bogart and Wichadee, 2015.) These can make the learning atmosphere free from stress and reduce the students' anxiety (Stapa and Shaari, 2012.) Their communication can flow smoothly and relieve the boredom of learning (Wee, 2013.)

Besides the advantages aforesaid, the findings of previous research have pointed to the usefulness of the LINE App on language learning. The questionnaire results collected from a sample of 128 Thai students at Bangkok University, Bogart (2014) revealed the students' positive attitude toward the possibility of using the LINE App in doing classroom assignments. He suggests that the teacher monitor how the students use the LINE App because many of its features are new to them. Additionally, Bogart and Wichadee (2015) investigated the use of the LINE App for academic purposes of 144 Thai undergraduate students who enrolled in English for Communication Arts Professionals course. The course selected promoted using LINE App for discussions and answering detailed questions about an unethical advertisement. From the questionnaire results, the students used the LINE App (95.8%) more than other social networking applications. They believed it was an effective communication tool (76.4%), especially using it as an online platform to learn English (72.2%.). A recent study conducted on 34 third-year students in an undergraduate hospitality program at a Thai university has revealed that the LINE App blended with classroom instruction was effective for learning English grammar and vocabulary. The questionnaire data showed that the students were satisfied with the blended method because they felt more confident

using the LINE App than other platforms (White, 2019a). In the same year, White (2019b) investigated the satisfaction and perceptions of learning via the LINE App of 30 textile engineering students in Thailand. The researcher uploaded English lessons about conversations and grammar structure through a LINE group. The lessons uploaded were in the form of document texts, video clips, and other presentation files. The results of the questionnaires and interviews showed that the students had a high level of perception of learning ($\bar{x}$=4.47; SD=.49). They also had a high level of satisfaction with using the LINE App as their learning resources ($\bar{x}$=4.51; SD=.43.), easy use of the application ($\bar{x}$=4.55; SD=.60) and the quality of the application for language learning ($\bar{x}$=4.48; SD=.50).

In Taiwan, a research study was conducted to explore the effects of the English spelling learning experience on the LINE App of 29 college students. The researchers created a LINE group used as a space for the participants to practice English spelling skills blended with lectures in the traditional classroom. This study took a total of six weeks for data collection. The students were assigned to practice exercises via the LINE App. Each exercise consisted of four vocabulary words the teacher recorded and sent to the students in an audiovisual file. The students needed to distinguish vowels, consonants, phonemes, and syllables because the researchers believed that before they could spell words correctly, they first used listening skills to identify the word components. The results of the pre-assessment and post-assessment showed a statistically significant improvement in the students' ability to classify vowels, phonemes, and syllables coupled with English spelling skills. The questionnaire results also showed that the students' satisfaction was moderate to good. The participants claimed that after-class exercises through the LINE App improved their ability to spell English to a great extent. They also claimed that the admiration and compliments given by the teacher via the LINE App could help build confidence and motivate them to improve their English skills.

Hsieh, Wu, and Marek (2016) examined the effects of flipped instruction treatment, using technology outside the classroom for learning, on improving the students' idiomatic knowledge. The researchers employed LINE App as a flipped instruction treatment in this study. The participants were 48 students at a four-year comprehensive academic university in Central Taiwan. Data were gathered from the pre-test and post-test on idioms, two questionnaires, observations, and semi-structured focus-group interviews. The study's findings showed that the flipped classroom using the LINE App for outdoor classroom learning could motivate the students to learn more English idioms. They acquired idiomatic knowledge and were more efficient at using the idioms learned from the application for communicative interactions, storytelling, discussions, speaking through dialogs, and group presentations.

Above, LINE App has gained the greatest popularity among Thai students and played a significant role in both modern-day communication and education. That is why this study used it as an alternative learning platform to improve Thai EFL students' spoken English.

Research Objectives

The objectives of the study were (1) to examine the effects of using LINE App for English speaking practice on the students' English speaking proficiency and (2) to study the critical role of contributory factors triggered by the use of LINE App, such as motivation, levels of anxiety, self-confidence, and convenience in improving the students' speaking proficiency

Research Questions

1. To what extent did the LINE App increase Thai EFL students' English-speaking proficiency?
2. To what extent did using the LINE App for language practice strengthen the influence of contributory factors on improving the students' English speaking proficiency?

Methods

Participants

The population was 232 EFL students with English-speaking pre-test scores less than 50% (25 out of 50 marks; See Appendix Scoring Rubric.) The researchers used the sample size calculation formula of Yamane (1967) to determine the size of the current sample group shown below.

n = the sample size
N = the population size
e = the error of the sampling method, which is 0.05

$$n = \frac{N}{1 + Ne^2}$$

$$n = \frac{232}{1+232(0.05)^2}$$

$$n = 146.84 \approx 147$$

According to the result, the proper sample size is 147; however, there were only 95 volunteering participants in this study. When this study was carried out, they were between 17 and 20-year-old first-year students from the faculties of science, engineering, public health, and nursing of Mahidol University in Nakhon Pathom Province, Thailand. They had studied English as a foreign language from primary school to their first year at university. However, their English speaking proficiency was relatively low, as indicated by numerous errors such as incorrect grammar, incorrect pronunciation, redundancy, ambiguous words, etc. For most of them, mastering English speaking skills was back-breaking because of their insufficient English knowledge and lack of opportunity to speak English as a routine.

For this reason, their spoken English needed improving. One alternative solution was LINE App, which contained numerous contributors to language learning such as LINE Dict, TH-EN translator official account, and many more. For all the participants, it was convenient to take part in this study because they had their own smartphones with at least one LINE account and used the LINE App almost every day to chat with their friends and teachers about personal and learning issues.

Procedure

Data collection took one month in the first university semester of the 2019 academic year. The process began with administering the pre-test to the students, then collecting their speaking progress through the LINE App, administering the post-test, and conducting the interview.

Pre-test

The students took the pre-test in the classroom. The test was designed to determine their English speaking proficiency before using the LINE App for language treatment. The speaking topic was "Types of Learners." Each student was given three minutes for preparation. While preparing, they were allowed to take notes and write down some ideas; they had five minutes for their talk.

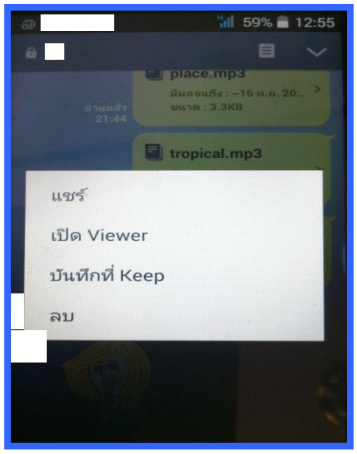
Speaking Practice on the LINE App

For four weeks, the students were given the speaking topics starting with the topic "Greeting" in the first week, followed by the topics: "Friends" in the second week, "Ordering Food through Different Languages" in the third week, and "The Best Place to Attract People" in the fourth week. The students could speak individually about these topics at their convenience on smartphones. When any student was ready to speak, s/he had to greet the teacher by sending a line sticker. When the teacher replied, the student could speak within five minutes. They could use the microphone icon on the LINE App or any recorder program on their phone to record their voice. Then the teacher corrected their speaking errors. If the students had some questions, they could ask the teacher immediately. Furthermore, the students could talk more if they wanted to. Figure 1 below shows the students' interaction with their teacher on the LINE App.

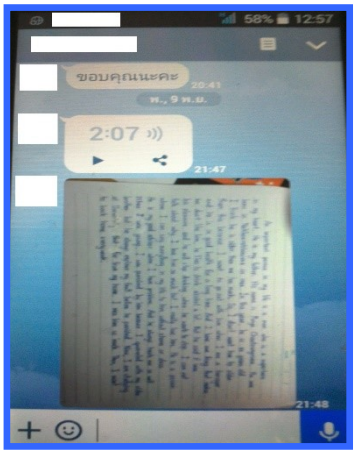
A. The teacher corrected a student's talk and the student typed "Thank You, Teacher." and sent James, a LINE character, to show appreciation.

B. A student posted a picture showing her topic and sent her recorded talk on an m4a file.

C.The teacher sent the correct pronunciation of the words a student said. The students said, "Thank you" and showed her feelings through two emoticons.



D. The audio file on LINE can be shared with other users. It can be opened with Viewer, recorded in Keep, or deleted.



E. A student practiced reading an English text out loud by recording her talk with the record bottom of the LINE app.

F. A student asked the teacher about her English speaking problems, said "Thank you," and sent a sticker showing her thank manner.

G. A student practiced his English speaking more than once to ensure that he could speak English well.

H. Before her talk, a student asked the teacher about some English grammatical points. The teacher explained the points and gave some examples.

IA student got confused about some grammatical points. The teacher explained the points to her and gave some examples. The student said "Thank you" with an emoticon showing a respoectful manner

Figure 1: Students' Interaction with the Teacher on LINE App

Post-test

The post-test evaluated the student's English speaking proficiency after four weeks of speaking practice on the LINE App. The topic was "My Family." The steps were similar to the pre-test.

Interview

One week after administering the post-test, an interview was conducted with ten volunteer students. They were required to give opinions about using the LINE App to help develop their English speaking proficiency. During the interview, each interviewee was asked one by one to ensure they would not copy the answers from the other interviewees. Each interview took around five minutes.

Data Analysis

1. The pre-test and post-test scores were analyzed with Paired Samples T Test, and the students' speaking errors were counted. This procedure was carried out to compare their English speaking proficiency before and after using the LINE App to find out any statistical significance that could prove the effectiveness of practicing speaking English on the LINE App.
2. The interview responses were transcribed and analyzed with the content analysis method to find the role of contributory factors reinforced by using the LINE App in improving their English speaking proficiency.

Test Reliability and Validity

According to the regulation of the students' institution, any test administered to students considered highly subjective, such as writing and speaking, needs a minimum of two raters to assess their performance. Likewise, the present study's tests were not exempt from such a regulation. Two raters gave the student's scores on both the pre-test and post-test. The first rater was the instructor of English Level 1, the fundamental English class of the institution, and the other was the coordinator in charge of teaching that class. The students' scores were calculated using Pearson Correlation to determine the inter-rater reliability of the scores given by the raters. The results show that the Pearson correlation coefficient, r, of the pre-test was 0.786, and the p-value was 0.002, while the correlation of the post-test was 0.806, and the p-value was 0.001. It indicates that the scores given by the two raters were significantly correlated. In this study, two raters used the item-objective congruence (IOC) to evaluate the pre-test and post-test validity. Both had more than 20 years of experience teaching English speaking. The result of the IOC of both tests was 1, indicating that the tests had an acceptable level of validity. Both raters also assessed the IOC for scoring rubrics, which was 0.82, suggesting that it also had an adequate level of validity.

Regarding the research's framework, Figure 2 below displays how LINE App's features are linked to the desired learning outcomes of the students' English speaking proficiency. LINE App's Chat Room contains Cameras, Audio, Video Calls, emojis, and emoticons. and stickers, which help to bridge the gap between teachers and students, allowing students to ask questions and discuss their speaking problems more (Bogart and Wichadee, 2015.) Shy students can avoid seeing the teacher in person by texting instead (Dincer and Yesilyurt, 2017.) They can use emojis and stickers to communicate with teachers as well. Because of the funny looks of these virtual stickers, psychological problems that may arise from students can be reduced. Besides, the unique qualities of the LINE App cannot only build learning motivation and self-confidence but also eliminate anxiety, such as fear of making errors and teachers and negative attitudes toward one's speaking ability (Tuan and Mai, 2015). It is because there are fascinating and challenging features newly developed available on the LINE App and the internet's capability to promote spontaneous responses, thus reinforcing enthusiasm for learning. A case in point is when in doubt, students can discuss problems with their teachers and friends in real-time and immediately without no need to wait for the next scheduled class day.

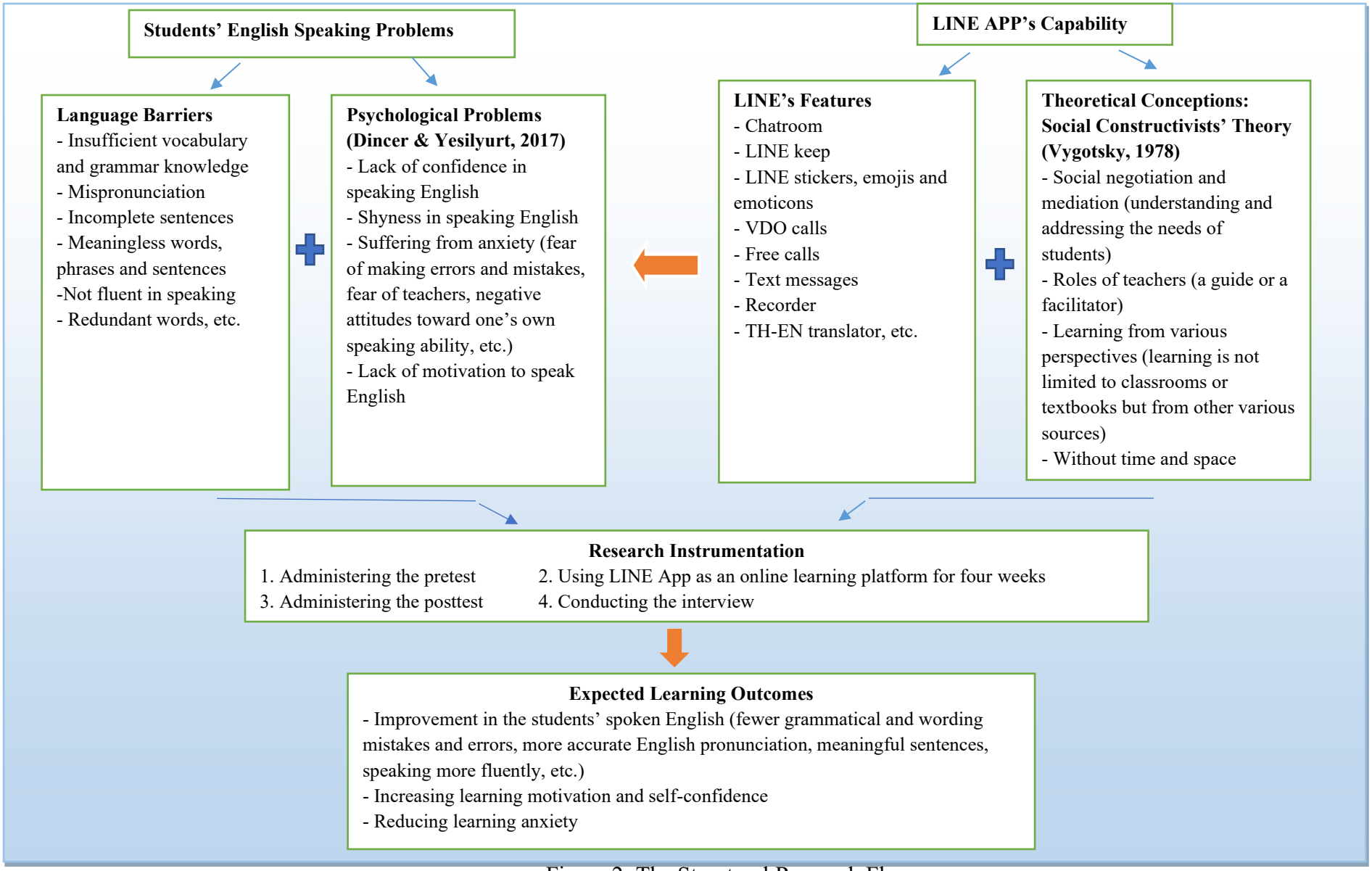


Figure 2: The Structural Research Flow

Furthermore, LINE App's features are likely to link to social constructivism theory (Vygotsky, 1978.) This theory states that learning is not limited to classroom learning; students can learn from things around them. These surroundings play the role of more knowledgeable others, people, or information resources that can increase the students' knowledge. In other words, LINE App is a means that leads students to obtain new knowledge from people or various sources through discussions, conversations, and consultations. These allow them to jump from the actual stage of development, the student's current abilities, to the potential stage of development, the maximum development according to their potential.

Due to the reasons mentioned, in this study, LINE App was applied as an alternative learning platform to determine that after the student participants had consulted with the teacher, submitted dialogues, and practiced speaking English through LINE App to what level their English speaking proficiency would be and how this App could help reduce their psychological problems.

Considering the research questions, the present study consists of two primary constructs: speaking proficiency and contributory factors. Speaking proficiency is the advancement in speaking skills the participants are expected to master at the end of the study. Contributory factors are composed of the convenience construct and affective factor constructs, emotional factors that affect language learning, such as motivation, self-confidence, and low anxiety levels. Both speaking proficiency and affective factor constructs are influenced by the convenience construct brought to students by the LINE App. The constructs and measures of the study are illustrated in Figure 3.

	Construct	Measures
RQ1: To what extent did LINE App contribute to increasing Thai EFL students' English speaking proficiency?	Speaking proficiency	Statistical significance of higher mean scores
		Speaking fluently without any long pauses (more than 1 minute)
		A smaller number of speaking errors such as grammar, vocabulary, and pronunciation
		Coherence in speaking (ideas are well-linked with credible explanations)
RQ 2: To what extent did using the LINE App for language practice strengthen the influence of contributory factors on improving the students' English speaking proficiency?	Motivation	Using new knowledge acquired from various sources such as LINE TODAY to build meaningful content for their talks
		Using new English vocabulary words like from TH-EN Translator
		Asking for advice from teachers and friends to improve their spoken English
	Low levels of anxiety	Using many funny, fun, lively, and enjoyable stickers, emojis, and emoticons for interaction with the teacher

		Smooth flow in speaking
	Confidence	Making eye contact and facial expressions with the teacher while speaking English
		Talking with the teacher more.
	Convenience	Immediate feedback, including comments and corrections from the teacher
		Facilitating consultation with the teacher and friends using voice and video calls
		Sharing lessons and various learning resources among teachers and friends rapidly

Figure 3: Constructs and Measures of the Study

Results of the Study

The pre-test and post-test scores indicate that the students' spoken English noticeably improved after the four weeks of speaking practice on the LINE App.

Table 1: English Speaking Proficiency of the Students Comparing the Pre-Test and Post-Test Scores

Speaking Proficiency	Full Marks	Tests	Min.	Max.	Mean	SD.	t	Sig. (2-tailed)
1. Fluency	10	Pre-Test	1	9	4.15	2.14	-12.20	.000
		Post-Test	2	10	6.15	1.73		
2. Pronunciation	10	Pre-Test	1	9	4.56	2.15	-12.20	.000
		Post-Test	3	10	6.79	1.81		
3. Grammar and Word Choice	10	Pre-Test	1	9	4.03	1.78	-16.74	.000
		Post-Test	3	10	6.24	1.54		
4. Content	15	Pre-Test	3	12	7.32	2.04	-10.78	.000
		Post-Test	5	15	9.66	2.64		
5. Facial Expressions	5	Pre-Test	1	5	3.03	1.12	-10.14	.000
		Post-Test	2	5	4.31	0.88		
Total	**50**	**Pre-Test**	**14**	**39**	**23.08**	**5.82**	**-23.79**	**.000**
		Post-Test	**24**	**45**	**33.15**	**4.29**		

Table 1 shows that the students acquired greater English speaking proficiency as displayed by a mean score of 33.15 out of the total 50 in the post-test, significantly higher than a mean score of 23.08 in the pre-test ($t = -23.79$, $p \leq 0.05$.) They gained higher mean scores in the subcategories of speaking skills such as fluency, pronunciation, grammar and word choice, explicit content, and facial expressions. The explicit content they narrated was far more exciting and meaningful, with

credible explanations and fine examples. They had better English pronunciation and spoke more fluently with fewer grammatical and wording mistakes. It indicates that the students developed greater proficiency after the treatment.

Pre-Test

The following excerpt is from the pre-test by a volunteer student.

⇨Pre-Test Topic: Types of Learners⇦

"What kind of learners are you and why? I am a visual learner because if thing [the intended word "think"] of an image [pronouncing /ImIt/ instead of /ImIdʒ/] in my head [Incomplete clause: missing the subject "I"], make a diagram, highlight important part and write summary [Incomplete clause: missing the subject "I"]. That's [Use of Verbs] make me understand and remember things better."

The above example shows that this student could not speak English much initially. Her talk was short, and although she had some ideas to support being a visual learner, most of her sentences were incomplete. She mispronounced some words and made a lot of grammatical errors.

Post-Test

The following excerpt is from the post-test by the same volunteer student.

⇨Post-Test Topic: My Family⇦

"My family always spends time together. We always have breakfast [Number and Article] and dinner together. Sometimes we go out for dinner at [Number and Article] restaurants and go shopping. Every year on my birthday we have a meal and dessert at the shopping mall. There is no cake, but I'm so happy. Moreover, we have done many activities together, such as working out, jogging and playing badminton, watching movies, and going to many tourist attractions in Thailand. In April, as soon as Songkarn Festival began, many visitors visited my maternal grandparents in Prae province. I play water fight. It's so much fun. Next, we make merit, offer the monk food, and visit our relatives in Singburi. I used to go abroad with my family also. Many years ago, we went to Hong Kong. It has many tourist attractions. We went to the Chinese Temple and amusement parks such as Ocean Park and Hong Kong Disneyland. I love it so much. We went to Ngong Ping too. It's a crystal cabin. We ate a lot of food and went shopping at the outlet. Finally, we went back to Bangkok. It was always a great time there. I'm so happy when we spend time together."

In the post-test, she came up with more ideas for her talk, which was much longer than the pre-test. She made fewer grammatical and wording errors with more accurate pronunciation.

Concerning the students' speaking practice on the LINE App from the first to the final week, it was found that the students had a noticeable improvement in their English speaking skills, as displayed by the following excerpts.

Speaking Practice on the LINE App

⇨ Week 1. Greeting⇦

"Next, I will talk about a good topic of conversation with someone you don't know well. For me [Redundant], I think a good topic of conversation is a basic question like "Hi, my name is…," How are you doing?" "What is your favorite color?" "What is your favorite movie?." And then talk about the movie they like, like "What kind of movie? [Incomplete sentence]," "Why do you like the movie?" "Who do you like in the movie?" I think it's a good [Use of Adjectives] for [Prepositions] talk about someone you don't know well."

⇨ Week 2. Friends⇦ "What does it mean, 'friends'? How is it important for people? [Incomplete sentence missing: 'it'] Before I talk about the meaning of friendship [Incomplete sentence: missing the main clause]. Friends mean those who dare to promise to be friendly or are still with us sharing their life even when we don't have to promise benefits[Incomplete meaning]. I have four close friends [Articles and Numbers] in my life, but I will talk about one person in debt [Mispronounced: "depth"]. Her name is Nam, but I call her Bow. I must know [Mispronounced "known"] her in grade 10. The first time we have not talked [Verb tense: past simple] anymore. I [Linking Verb] close with her in the last semester in grade 10. However, we have [Word choice] still good friends. We help [Verb tense: past simple] each other with our homework and spend [Verb tense: past simple] the weekend together. We go through [Verb tense: past simple] a lot of hardship together. She was beside me all day of my trouble. Now she is studying architecture. We have not talked [Verb tense: present perfect] for a month [Articles and Numbers]. And I don't know why we don't talk anymore. I want to know. I wish we talk [Verb tense: past simple] like past, and I miss her so much."
⇨ Week 3. Ordering Food in Different Languages⇦ "How many language [Noun: plural form] can you order a meal? All have a simple conversation [Incomplete sentence: missing the subject]. I can use tree [Mispronounced: "three"] language [Noun: plural form] is [Verb: incorrect use of "be"] Thai, English and Korean to order a meal or have a simple conversation. Thai language is my mother tongue. I use [Incomplete sentence: missing the object] in daily life to communicate with other people around me while English language is my second language from [Preposition] I learn at the school, but I'm not good at skills to use[Word choice] very much and Korean language I use a little bit. For example, when I was 16 years old, I went to travel at [Preposition] South Korea and I want [Preposition: missing "to"] eat some desserts. I order two blueberries and cream, but a waitress hasn't understood [Verb tense: past simple]. I saw menu [Article and Number] in Korean language. So I list menu [Article and Number] and told her. Her understand [Noun form] because I can list and speak Korean language."
⇨ Week 4. The Best Place to Attract People⇦ "I'm going to recommend the best place to experience natural beauty of my country. If you like atmosphere of forest [Article and Number] and view, you can go to Kanchanaburi where [Relative pronoun] [missing "verb"] near Bangkok and many other natural resources. That's why people from the capital city always travel in this province. Most of the area is the forest and two rivers flown through that suits for relaxation. The most famous place that I think everybody knows is Erawan Waterfall. There are many of Thai and foreign travelers visit [Verb form] it every day. Erawan Waterfall is a large waterfall. There are seven floors and each floor is difficult to walk through because sometimes we have to climb on the wet floor or stone but it's worth working because you can see the blue water like a swimming pool flown from a high cliff. It flows through green plants and white limestone to the basin that's full of fish. If you are the one who loves to walk in the forest, see waterfalls and nature or swim in the blue water, you shouldn't miss this place. You can go to Erawan Waterfall every time of year except between December to April because the dry season makes the water level lower than other months."

In addition to a higher score in the post-test, the students also made fewer speaking errors as shown in Table 2 and Table 3.

Table 2: English Speaking Errors Detected in the Pre-Test Speaking Topic "Types of Learners"

Types of Errors	Number of Errors	Percentage	Examples of Errors Found in the Study
1. Repeated Subject	32	2.49	*Error:* "My learning type I am a visual learner." *Correction:* "I am a visual learner"
2. Incorrect Subject and Verb Agreement	78	6.07	*Error:* "I needs to study harder." *Correction:* "I need to study harder."
3. Incorrect Use of Final Sounds	94	7.31	*Error:* "image" [pronouncing /'ImIt/] *Correction:* "image" [pronouncing /'ImIdʒ/]
4. Incorrect Use of Tenses 4.1 Past Simple	113	8.79	*Error:* "Ten years ago, I am a little girl and I like drawing." *Correction:* "Ten years ago, I was a little girl and I liked drawing."
4.2 Present Progressive	28	2.18	*Error:* "I trying to pay attention" *Correction:* "I am trying to pay attention."
5. Fragments	167	13	*Error:* "Doing many activities fun for me." *Correction:* "Doing many activities is fun for me."
6. Pause (more than 1 minute)	121	9.41	*Error:"* I like ……..Ah……(more than 1 minute pause) drawing." *Correction:* "I like drawing."
7. Incorrect Word Choice	89	6.92	*Error:* "In my idea, you can learn best if you are diligent." *Correction:* "In my opinion, you can learn best if you are diligent."
8. Double Negative	11	0.86	*Error:* "Intrapersonal students don't have no friend." *Correction:* "Intrapersonal students don't have friend."
9. Incorrect Word Stress	79	6.14	*Error:* "Every learner needs good communication [pronouncing /kʌ'mjunI keI'ʃən/]." *Correction:* "Every learner needs good communication [pronouncing /kʌmjunI 'keIʃən /]."
10. Incorrect Pronunciation	67	5.21	*Error:* "kinesthetic" [pronouncing /ķInəs 'θɛtIk/] *Correction:* "kinesthetic" [pronouncing /ķInIs 'θɛtIk/]
11. Incorrect Conjunctions	47	3.65	*Error:* "I study hard and I can't get good grades." *Correction:* ""I study hard but I can't get good grades."
12. Redundant Verbs	52	4.04	*Error:* "That's make me can understand and remember things better." *Correction:* ""That makes me understand and remember things better."
13. Articles (a, an, the)	197	15.3	*Error:* "I would like to study an abroad." *Correction:* "I would like to study abroad."
14. Pronouns	111	8.63	*Error:* "My friends and me usually study together." *Correction:* "My friends and I usually study together."
Total	**1286**	**100**	

Table 3: English Speaking Errors Detected inthe Post-Test Speaking Topic "My Family"

Types of Errors	Number of Errors	Percentage	Examples of Errors Found in the Study
1. Incorrect Subject and Verb Agreement	33	6.68	*Error:* "We lives in a small house." *Correction:* "We live in a small house."
2. Incorrect Use of Final Sounds	24	4.86	*Error:* "average" [pronouncing /'ævəɹIt/] *Correction:* ""average" [pronouncing /'ævəɹIdʒ/]
3. Incorrect Use of Tenses 3.1 Past Simple	65	13.16	*Error:* "Yesterday I visit my parents in Rayong." *Correction:* ""Yesterday I visited my parents in Rayong."
4. Fragments	48	9.72	*Error:* "Happy living with my family." *Correction:* "I am happy living with my family."

Types of Errors	Number of Errors	Percentage	Examples of Errors Found in the Study
5. Incorrect Word Choice	78	15.80	*Error:* "I usually help my mom make chores." *Correction:* "I usually help my mom do chores"
6. Double Negative	9	1.82	*Error:* "My father doesn't have nothing to do at home." *Correction:* "My father has nothing to do at home."
7. Incorrect Word Stress	47	9.51	*Error:* "At home I usually walk around my neighborhood [pronouncing /neI 'bəḥUd/." *Correction:* ""At home I usually walk around my neighborhood [pronouncing /'neIbəḥUd /."
8. Incorrect Pronunciation	35	7.09	*Error:* "At home we live together in perfect harmony [pronouncing /'həɹməni/.]" *Correction:* "At home we live together in perfect harmony." [pronouncing /'hɑɹməni/.]"
9. Incorrect Conjunctions	12	2.43	*Error:* "My mother is short, and I am tall." *Correction:* "My mother is short, but I am tall."
10. Incorrect Use of Auxiliary Verbs	8	1.62	*Error:* "My mother don't usually go shopping at the market." *Correction:* "My mother doesn't usually go shopping at the market."
11. Articles (a, an, the)	88	17.8	*Error:* "I experience a loneliness when I stay far from them." *Correction:* "I experience loneliness when I stay far from them.".
12. Pronouns	47	9.51	*Error:* "Some people leave his parents behind." *Correction:* "Some people leave their parents behind."
Total	**494**	**100**	

Seeing the tables above, the number of errors the students made in the pre-test was relatively higher than those detected in the post-test. In Table 2, the students made 1286 errors in total. The types of mistakes noticed most were incorrect uses of articles (15%), followed by fragments (13%), and past simple (9%.) In addition, the students were not fluent in speaking English, as they paused for more than one minute 121 times. Surprisingly, they made only 494 errors in the post-test, as illustrated in Table 3. The errors drastically decreased; some of them, like repeated subjects, present progressive, redundant verbs, and pauses (more than 1 minute), were not found in the post-test.

Apart from the statistical evidence mentioned, the interview results reveal that the students liked practicing their spoken English on LINE App more than learning in the classroom. All the interviewees claimed that LINE App's features contributed to language learning achievement. Camera Icon, for example, allowed them to take pictures of the lessons on the screen during the study time in the classroom and share them with friends. The teacher did not have to review the lessons with them many times because when they did not catch up with some points, they could review the lessons by themselves in LINE Keep. Besides, the teacher could post some pictures with some explanations on LINE App to help students follow news and current issues.

"Besides, Camera Icon available on the App helps us take pictures faster. We can save pictures taken in the classroom such as lecture explanations, classroom assignments, and everyday lessons with the LINE App and share those pictures with friends. Since LINE App saves information efficiently and we can look it back anytime in LINE Keep, we don't have to ask the teacher repeatedly. We are in the information technology

era and many students and teachers use smartphones. We can carry our smartphones wherever we go. Unlike textbooks we use particularly for learning, smartphones have many practical functions supporting learning."

"LINE App allows people to stay up-to-date with new information. For example, when students don't understand some lessons, the teacher can post pictures with some explanations on the LINE App. You can access and follow various sources of news and current issues. Additionally, students feel free to ask some questions through the LINE App if they did not dare to ask the teacher in the classroom."

"It is almost impossible that every student in a big class will completely understand the lesson. That is, some may not be able to catch up with the words. But LINE App gives students a great opportunity to learn more details."

All the interviewees said that LINE App brought convenience when asking the teacher because they were afraid to ask the teacher face-to-face in the classroom. LINE App allowed them to consult with their teacher avoiding seeing each other in person. They could speak more because they felt free from the anxiety of seeing the teacher officially.

"LINE App has fulfilled a gap between teachers and students since we can use it to communicate with each other. We can send the information and its details rapidly. We can make a LINE group and allow other students to share ideas. Also, LINE App can be used for personal communication. We feel more confident and have less anxiety to ask the teacher unofficially on LINE."

"LINE is advantageous for language learning. When I don't understand the lessons and feel afraid to ask the teacher directly in the classroom, I ask her through LINE personally. It seems to be more convenient."

Additionally, the teacher could post new lessons. It could help students study the lessons in advance.

"When the teacher has new lessons, she can post them so we can study the lessons beforehand. LINE App brings us more convenience to communicate with each other."

The students also had more ideas to support their talks because they could receive news from their teacher and classmates on the LINE App.

"Students can receive news and up-to-date information from their teachers and classmates on the LINE App. When they have problems, they can consult with their teachers or peers."

They also mentioned the convenience of contacting friends and teachers on LINE App, which was faster than face-to-face communication. When they posted their learning problems or questions on LINE App, they could get the answers promptly. They did not have to wait for the next scheduled class day. Moreover, their answers were various and helped them create many new ideas for their talks.

"LINE App is practical and fast. Students can use LINE App to chat with other friends about their learning lessons. They can share the lessons with a large group of friends. Enclosing lessons in LINE App makes learning easier and more comfortable."

"LINE App allows us to communicate with each other more conveniently and rapidly. Moreover, if we post some learning issues in a LINE group, we can get a variety of answers. I think various answers make me have more ideas to speak English"

"LINE App brings convenience to modern people. We can use LINE App to communicate with other people faster. For learning, the teacher can explain the lessons to students immediately. Students can ask questions

and get answers through this application. If the teacher wants to emphasize some issues, she can post them on LINE App."

"Because most people have LINE accounts, learning English through LINE is more comfortable and easier."

"Students can contact friends or teachers anytime instead of waiting for their learning session."

Some of them claimed that they could stay connected and use a VDO call, a voice call, and text messages available on LINE App to ask the teacher or friends when they did not catch up with some lessons.

"I usually use a VDO call or a voice call through LINE App when I don't understand the lesson."

"We can text messages on LINE App. When we ask our teacher about English lessons through LINE App, she can text messages as an answer. Texting messages is more accurate than speaking."

Some of them said that when they lost the word, they consulted TH-EN translator, an official account available on LINE App. The translator was of much help. They spoke more fluently without frequent pauses because it could translate their Thai words or phrases into English at once.

"It was like words were on the tip of my tongue. Many times I lost words or phrases. I paused, paused, and paused. I felt bad when I kept the teacher waiting for my answers. Fortunately, after TH-EN Translator was introduced to me, speaking English was easier. It helps me translate words and phrases rapidly. I think now I can speak English faster and better."

More importantly, most said that practicing their spoken English on LINE App could reduce their learning anxiety because they could use LINE stickers, emojis, or emoticons to show their feelings or respond to their teacher. They preferred using these stickers to text messages because they were more fun, funny, lively, and enjoyable.

"I prefer using LINE stickers, emojis, and emoticons to texting messages to my teacher or friends because the stickers look fun, funny, lively, and enjoyable. I feel free from anxiety."

As for English-speaking assistance, all the interviewees believed that LINE App was one of the most effective social networking apps for English-speaking practice. It provided numerous features to reinforce language learning, such as free calls, VDO calls, LINE Keep, LINE recorder, etc. The VDO calls significantly enhanced their confidence and improved their body language while speaking English since it was like face-to-face communication. In other words, the teacher could see their face and vice versa. When they video-called more frequently, they were familiar with the teacher and overcame shyness. The students used the mentioned features to discuss their speaking topics with their teachers and friends. They could send their recorded talks to the teacher as well.

"I felt more confident speaking English as I saw my teacher many times during VDO calls. We are familiar with each other. I am no longer shy to speak with her. Because I could overcome shyness, I made better eye contact and gestures."

"When I don't understand or have no ideas about the speaking topic, I usually consult my teacher and friends through voice calls and VDO calls because they are free and convenient. I sometimes record my voice with LINE Keep and LINE recorder and send it to my friends. Some of my friends have better English speaking skills so they can check, correct, and comment on my talk. I don't have to record my voice on CDs but I can send it through LINE. I love LINE App. It makes me happy with learning and speaking English."

Almost all of them claimed they could pronounce English words and phrases better because when they mispronounced, the teacher always promptly sent back the correct words and phrases in MP 4 files on the LINE App.

> "I received the correct pronounced words and phrases in mp4 files. They were easy to open on my smartphone. When the teacher sent the files back to me, I knew how to pronounce so now I can speak English better."

> "I feel happier speaking English through LINE App because I can send my talk in mp4 files. I am not worried about teacher interruption, so I can speak English better."

Some of them believed that LINE App was a good means for learning English and world knowledge because they could receive news from links posted in LINE Chat Room. When they clicked the link, they could access many websites, read, and learn lots of current issues that could be used as supporting ideas for their talk. Besides being a means, LINE App itself was a source of news as there was LINE TODAY, a source of news.

> "I think I learn lots of current news from the LINE App. I get news and word knowledge from links posted in LINE Chat Room and LINE TODAY, a source of news available on the LINE APP. I can speak English better because I have more ideas to speak. I have learned them from LINE TODAY because there are various types of news. I can use them as supporting ideas for my talk."

Last but not least, all the interviewees claimed that they preferred receiving feedback on the LINE App to receiving it in the classroom. They thought that the feedback from the teacher on LINE App was more thoroughly stated since the teacher could listen to their recorded voice many times on the application.

> "I think the feedback I received on LINE App is more thoroughly stated than that I received in the classroom. The teacher gave me finely detailed feedback which I could use to improve my speaking on LINE App. I think this is because when I recorded my voice and sent it to the teacher on this application, she could listen to it many times, so she could give me lots of useful comments. However, the teacher could listen to me only once when I spoke English in the classroom."

The results of this study have confirmed the effectiveness of the LINE App used as a platform for speaking classes. With the availability of its features like free voice calls, VDO calls, LINE Keep, LINE Recorder, LINE Camera, stickers, emojis and emoticons, and many possible upcoming services that will appear on the LINE App shortly, students could practice their spoken English in their peak performance. Besides, they enjoyed having English speaking practice through the LINE App more than learning in the classroom.

Table 4: Summary of the Advantages of LINE Features for English-Speaking Practice

LINE's features	Advantages of each feature to improving the students' spoken English
Camera icon	Students took pictures of the lessons and shared them with friends faster.
Keep	Students kept track of news, current issues, and lesson explanations and looked them back when necessary.
LINE stickers, emojis, and emoticons	Stickers, emojis, and emoticons made students fun, enjoyable, and less anxious while learning.
VDO calls	Students built up confidence and improved body language while speaking English via VDO calls.
Free calls	Students who were afraid of talking with their teacher face to face could use free calls to consult with the teacher and practice their spoken English.
Text messages	Students texted messages to their teacher when they did not understand some lessons.
LINE recorder	Students could send their recorded talks to the teacher.
Chat Room	The teacher could post links, and when students clicked on them, they could access many websites, read and learn many current issues that could be used as supporting ideas for their talks.
TH-EN translator	When students could not think of words to speak out, they could use words from the translator.

The table above displays the usefulness of LINE's features gathered in this study that contributed to success in the students' spoken English.

Discussion

The current study results show that the students acquired greater English speaking proficiency after practicing speaking English through the LINE App. The measure of success in speaking is a higher mean score in the post-test which is statistically significant ($\bar{x} = 33.15$, $t = -23.79$, $p \leq 0.05$). It suggests that the students could apply new knowledge such as vocabulary from TH-EN Translator, English grammar and pronunciation competence gained from consulting with teachers and other friends, and general knowledge acquired from various sources during the practice to enhance their English speaking proficiency. In addition to the statistical difference, the indicators that indicate the improvement in their spoken English include less hesitation to speak. During the post-test, no students paused for more than 1 minute. The students could use vocabulary and grammar more accurately, making fewer language errors. The students also used the knowledge from various sources during the speaking practice to make their talks more exciting and consistent. Because the examples that supported the credibility of their talks were well used, their talks had internal coherence. However, these desired outcomes could not have been achieved without contributory factors triggered by the LINE App, as discussed below.

Motivation

Motivation is students' determination to reach their goals through various learning behaviors. This study found that the students were highly motivated to practice their English speaking through the LINE App. The indicators of their motivation include curiosity to learn more English words, such

as learning new words from the TH-EN Translator, asking for advice from teachers and friends to improve their spoken English, and using new knowledge from LINE today as supporting details to enhance the credibility of their talk resulted in higher scores in speaking. This set of data was derived from the interview responses. "*I usually consult my teacher and friends through voice calls and VDO calls….*" "*Fortunately, after TH-EN Translator was introduced to me, speaking English was easier....*" "*Some of my friends have better English speaking skills, so they can check, correct and comment on my talk...*" "*I love the LINE App. It makes me happy with learning and speaking English….*" "*I can speak English better because I have more ideas to speak. I have learned them from LINE TODAY....*" These results indicate that the LINE App could strengthen their instrumental motivation, a type of motivation that leads students to their intended goal for this study to speak English better. In developing language potential, many researchers and scholars have recognized the importance of motivation in the language learning outcomes of students. Seven (2020) states that motivation encourages learners to express their actions and behaviors that promote learning and lead them to success as intended. Seven (2020) suggests that building motivation in the classroom is necessary for every language class, and teachers should include activities that generate motivation in their teaching plans. Listyani and Tananuraksakul (2019) point out that motivation is another factor determining a student's language learning success. Both integrative motivation and instrumental motivation play an important role in making learners successful in language learning (Listyani and Tananuraksakul, 2019.) Integrative motivation is a student's desire to be part of the native speakers' culture. It leads learners to the process of acculturation in the target language community, which is essential for acquiring a second language because the social and psychological distance between students and the target language community will be smaller (Brown, 1992). In terms of instrumental motivation is another type of stimulus that results in a student achieving a set goal, such as getting better jobs, getting better grades, obtaining a degree, etc. (Listyani and Tananuraksakul, 2019.)

Self-Confidence

Self-confidence is one construct that determines a student's motivation level in learning a language (Xu, 2011.) In other words, when students have self-confidence, they will dare to express their opinions and experience new and more challenging things, which drives motivation. In the present study, the interview results show that the students felt more confident speaking English after practicing their speaking skills through the LINE App. They dared to make eye contact with the teacher while speaking. They also dared to talk with and ask the teacher for advice. *"We feel more confident and have less anxiety to ask the teacher unofficially on LINE App…." "I felt more confident speaking English as I saw my teacher many times during VDO calls…." "We are familiar with each other. I am no longer shy to speak with her. Because I could overcome shyness, I made better eye contact and gestures…."* These responses indicate that the LINE App can help increase the students' self-confidence. Many researchers and scholars consider self-confidence to be correlated with academic success. The advanced student's confidence leads to their courage to communicate in a more target language (Clément, 1986; Clément and Kruidenier, 1985; Noels,

Pon, and Clément, 1996; Yang, Noels, and Saumure, 2005). In addition, self-confident students tend to be persistent in the challenging tasks they face (Tunçel, 2015.) On the other hand, students with low self-confidence often exhibit fearful, antisocial, and insecure behavior blocking them from learning and creating negative attitudes toward language learning (Bong, 2008; Pajares and Miller, 1994).

Low Levels of Anxiety

Brown (2007) and Al-Khasawneh (2016) state that anxiety is one of the significant affective factors in learning a foreign language. Liu and Huang (2011) point out that language anxiety is one of the most powerful indicators of a student's success in language learning. In the present study, it has been found that practicing speaking English through LINE App could help reduce speaking anxiety. This is due to features such as cute, funny, and lively stickers, emoticons, and emojis. These can reduce students' anxiety in interacting with teachers and other students. *"Because the stickers look fun, funny, lively, and enjoyable. I feel free from anxiety…."* Of course, when students felt less anxious by the impulse of these appealing features, they would have the courage to interact with teachers using these emojis, emoticons, and stickers instead of text messages. With more interaction and communication, the students were more familiar with the language, resulting in the courage to speak English with the teachers. They could thus talk in English smoothly, as seen in the results that there were no long pauses. Recent research has found that high language anxiety is a significant contributor to language learning failure (Mesri, 2012; Al-Shboul, Ahmad, Nording, and Rahman, 2013; Toghraee and Shahrokhi, 2014; Lian and Budin, 2014; Gopang, Bugio, and Pathan, 2015.) Horwitz et al. (1986) claim that foreign language anxiety plays a huge role in doing the exams. Many students with anxiety during exams usually forget grammatical structures and vocabulary words in English. This is due to their high level of anxiety, though, in regular classes, they understand and learn the language well. (Al-Khasawneh, 2016.)

Convenience

Convenience is crucial for millennial students to choose social media tools, including collaborative technologies, to support their learning (Jang, 2015.) In the present study, LINE App was proven convenient for students to practice speaking English outside the classroom without restrictions on location and time. They also received feedback and comments from teachers immediately. They could review and study lessons in advance from the files the teacher posted in LINE Chat Room. *"I ask her through LINE App personally. It seems to be more convenient…." "When the teacher has new lessons, she can post them so we can study them beforehand. LINE App brings us more convenience to communicate with each other…."* These responses reveal that LINE App provided convenience for students to practice speaking English. Ragupathi (2013) claims that students should not be disturbed by other students while focusing on the task, and convenience should be given to students. Jang (2015) mentions the three salient types of convenience: convenient to everybody in the team, convenient to access and use, and convenient to collaborate privately within the team, all of which can be provided by the LINE App. LINE App encourages students to create

LINE groups to discuss with their teams. With the speed of the internet today, students can access the application easily and quickly. In addition, students can make a private LINE group to discuss their learning problems with friends. It shows that the LINE App provides the convenience of learning for students, facilitating practicing English skills.

Apart from the discussions above that have confirmed the effectiveness of the LINE App for English-speaking proficiency, the application's usefulness in language learning is also emphasized in previous studies. According to the findings of the research studies conducted by Bogart (2014) and Bogart and Wichadee (2015), it was found that Thai students used the LINE App more than other social messaging applications. They believed that the LINE App was another effective communication tool for teaching language courses. White (2019a) and White (2019b) found that LINE App blended with the traditional classroom model helpful in increasing the knowledge of English vocabulary and grammar. The volunteer participants in his study were also satisfied with using the LINE App for teaching and learning. Hsieh, Wu, and Marek (2016) found that the flipped classroom instruction using LINE technology could enhance the participants' idiomatic knowledge and encourage learners to apply those idioms to many speaking activities such as interaction among themselves in English, storytelling, discussions, and group presentations. McCarty, Sato, and Obari (2016) found that the students' productive and receptive skills greatly improved after using the LINE App as a medium for interaction in English. They also found a high level of satisfaction with using the LINE App for learning English among the participants

Besides LINE App, other similar social applications have been found effective for teaching and learning foreign languages. Bensalem (2018) compared the performance of two groups of students between the WhatsApp group and the traditional classroom group. The results revealed that the WhatsApp group outperformed the conventional group. They had a greater knowledge of academic English vocabulary and motivation to learn more English vocabulary. Ta'amneh (2017) found that a group of students that studied from both WhatsApp and the regular classroom developed better reading and speaking skills than those who learned in the regular classroom alone. Alqahtani et al. (2018) found that the participants were satisfied with using WhatsApp to support their English language learning. Besides WhatsApp, in South Korea, KaKao is another popular instant messenger. Baek et al. (2017) found the language exchange activity through KaKaoTalk helpful for learning Korean and English vocabulary, pronunciation and culture. According to the present study's findings and those obtained from previous studies, it can be said that LINE and other similar social applications can be one of the best choices for learning foreign languages.

Apart from the constructs and related research mentioned above, there are other factors for language learning success that can be reinforced by using LINE App (Tuan and Mai, 2015.)

Performance conditions

When students speak English, they usually talk under various conditions, including time pressure, planning, the standard of performance, and the amount of support (Nation and Newton, 2009.)

Under time pressure, students have to put in a great deal of effort to complete any speaking task within a limited time. They need to plan for their talks to get a high score. They need to speak their best to meet the performance standard, such as grading criteria set by the teachers. Students need the proper support from their teachers, classmates, parents, and mobile-assisted language learning applications. With the wide availability of social media platforms, especially the LINE App employed in this study, the students were free from time pressure. When they had questions about their spoken English, they could consult their teachers on the LINE App without time constraints. LINE App helped them prepare well for their talks as they could practice speaking by facilitating features such as recorder, VDO calls, ChatRoom, LINE Dic, and a lot more involved in this application.

Listening ability

The students in this study claimed that their spoken English was better after they learned how to pronounce English words and phrases correctly from the MP4 files sent from the teacher as feedback on their performance on the LINE App. When their listening ability was better, they could acquire new lists of English vocabulary and convey meaning through their spoken English. This response implies that the LINE App is another good choice for students to practice their listening ability. According to the students' beliefs, as stated in this study, it seems to be related to Doff's (1998.) That is, speaking skills should be developed, accompanying listening skills. Before speaking out, every speaker needs to listen and interpret the meaning of what they hear first. They can understand the conversation and speak fluently if their listening skills are good.

Topical knowledge

The interview results reveal that the LINE App is a good source of knowledge as it contains many news stories and current issues, especially LINE TODAY, a good news source. Besides, the students could add more news accounts on this App or click links posted in LINE Chat Room to support their talks. LINE App is a significant source of information, allowing students to access the latest news and enhancing their topical knowledge. Bachman and Palmer (1996) claim that topical knowledge affects speaking skills because speakers can speak well if they have a relevant topical understanding of the tasks given. In other words, students can make their talks more informative and exciting when they have sufficient knowledge about the assigned topics.

Feedback during speaking activities

Although most students want feedback from their teacher, the teacher should not always correct mistakes because over-correction can interrupt the conversation flow (Harmer, 1991.) Most importantly, when teachers give some feedback, they need to consider the stages of the lessons, the activities, and the types of mistakes (Harmer, 1991.) This study has guaranteed that the LINE App is a good platform for teachers to send feedback to their students. As shown in the interview results, the students liked receiving feedback from LINE App more than getting it in the classroom because they were less anxious whenever they could avoid face-to-face interaction. They chose to

send their talks in MP4 files on the LINE App, so they could speak English without being obstructed by the teacher as it usually happened in the classroom.

The results, as shown here, have confirmed that the LINE App can be used efficiently as a learning platform for English-speaking practice, though the application was not initially invented for such a purpose. As presented in this study, the students could communicate with teachers and friends in Chat Rooms where they could take and post pictures, show reactions through LINE stickers, emojis, and emoticons, send their talks in MP4 files or other formats, post links, and record and send video clips. They could read current news from LINE TODAY and use the information and knowledge received from the news to support their talks. They also learned new English vocabulary words from LINE Dictionary and TH-EN Translator. All the features mentioned can reduce their learning constraint and enhance their motivation and self-confidence in speaking English.

Research Implications

Owning essential features for communication such as video calls, voice calls, Camera Icon, Chat Rooms, KEEP, and cute and fashionable stickers, emoticons, and emojis, the LINE App makes speaking English much more accessible, more enjoyable, and more successful. Furthermore, because LINE App is an online platform, the unique feature of this social network has more speed and storage capacity; students can get answers promptly after consulting with their teachers and simultaneously acquire new knowledge from a massive range of information resources. However, despite LINE App's infinite contributions to improving English speaking skills, as indicated by this study, teachers need to consider many factors listed below when using LINE in teaching.

Notification

In LINE's system, newer notifications replace those older ones preventing teachers from seeing notifications from previous students. Teachers can solve this problem by turning off notifications of inactive groups or creating a separate LINE group or a particular account for students to contact and discuss about their learning.

Contact time

In this study, the teacher did not set the time for students to contact her online so many students submitted questions at an inappropriate time. It caused a delay in receiving an answer from the teacher. A recommendation is that teachers set the time for students to discuss their English-speaking problems so that students can get answers promptly and quickly.

Appropriateness of stickers and emojis

In this study, the teacher did not impose any restrictions on using stickers and emojis, resulting in some students sending disrespectful stickers. It is suggested teachers have restrictions on the format of stickers and emojis for polite communication between teachers and students.

Storing data files is only temporary.

In LINE's system, all files are automatically deleted within two weeks, causing comments and suggestions teachers give students to disappear. Teachers should advise students to store various data files in KEEP so that if in doubt, they can go back and view them again.

Suggestions for Future Research

Future researchers can use the LINE App as an alternative teaching medium to explore students' learning achievements in other skills such as listening, writing, reading, and even learning other languages. LINE App can also be integrated with effective language learning strategies such as memory, cognitive, compensation, metacognitive, affective, and social strategies. When combined with other learning strategies, researchers may compare traditional teaching with LINE-based teaching and LINE-based teaching combined with different learning strategies to see how effective they are.

Conclusion

The results of this study reveal that using the LINE App as an online space for English-speaking practice significantly increased the students' English-speaking proficiency. It is because this application could strengthen the influence of contributory factors such as motivation, self-confidence, and convenience, simultaneously significantly reducing the students' anxiety. Shedding light on the findings, language teachers should pay close attention to these critical factors because they play a crucial role in students' achievement. The teacher should create activities that stimulate students' motivation to study, which may be just the level of instrumental motivation, or if it is integrative motivation, it will be considered excellent learning support (Listyani and Tananuraksakul, 2019.) The activity must not prevent students from feeling overly anxious, as a high level of anxiety can reduce their learning potential (Al-Khasawneh, 2016.) The teacher should create a relaxed learning atmosphere to maintain the appropriate level of anxiety in learning. It must be fun and challenging to boost students' confidence in using the target language. A plausible outcome is that students will have the courage to express their opinions and speak more in English. In other words, higher motivation and less anxiety can boost students' confidence in learning. It makes them not afraid of making mistakes while speaking English. However, none of these desired outcomes can happen without the convenience offered by the LINE App.

Almost all the features of this application can be applied as a medium to promote language learning and teaching efficiently. Language teachers can post messages and send video and document files for students to study in the blink of an eye. However, it is recommended that teachers tell students to keep lesson files, including supplementary worksheets, in LINE KEEP because all files in LINE ChatRooms are temporarily stored for up to two weeks. After that period, those files cannot be opened. The teacher should be aware that the lessons posted must not infringe on the owner's copyright. The teacher may instead post a link to the owner's website and allow the students to read more on their own or even create their lesson. In addition, the teacher should check the correctness of the content and lessons before sending them to students to study.

Limitations of the Study

One of the reasons for conducting this research study was to enhance the English-speaking skills of the students in the educational institution the researchers have worked for. Therefore, the study's results obtained from 95 students were merely the outcomes of a sample of the teaching method employed in the institution and thus cannot be generalized with other cases. It is recommended that researchers interested in using social media to teach language can apply this study's research process and teaching methods to trial in their research.

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Appendix

Scoring Rubric for English Speaking Pre-and Post-Tests

Scoring Criteria	Maximum Score	Earned Score
1. Fluency		
1.1 Speak with the acceptable number of pauses	5	
1.2 Don't repeat or use redundant words	5	
2. Pronunciation		
2.1 Pronoun words correctly	5	
2.2 Stress syllables and words in the sentences correctly	5	
3. Grammar and Word Choice		
3.1 Speak with grammatically correct sentence structure	5	
3.2 Use appropriate words and expressions	5	
4. Content		
4.1 Show coherence	5	
4.2 Speak relevantly to the topic with clear and impressive examples	5	
4.3 Speak within an acceptable length of time	5	
5. Facial Expression		
5.1 Look at the audience while speaking	2	
5.2 Be confident and try to engage the audience's attention	3	
Total		

A Collaborative CLIL Teaching Between ESP Teacher and PR Professionals IN English for PR Course

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ABSTRACT

Most CLIL research examines the effects of the collaboration between content subject teachers and language teachers. Besides, CLIL research in the PR ESP domain has rarely been implemented. Consequently, this research aims to highlight a CLIL collaboration between an ESP teacher and the domain experts outside the educational setting in an English for PR course at a public university in Thailand. A group of domain experts in PR and related fields was invited to participate in the course design and planning. One PR professional also joined one class sharing his/her real-world experience with undergraduate students. To examine the effectiveness of collaborative CLIL teaching, students were pre-tested and post-tested. Students' opinion evaluation questionnaires and semi-structured interviews were also conducted at the end of the course. The findings revealed the beneficial effects of the collaboration, such as increased authenticity in the ESP classroom and improved students' academic achievement and motivation. This research significantly contributes to pedagogical PR research and bridges a gap between theory and practice.

Keywords: PR and communication industry, media, CLIL in ESP context, public relations research, collaborative teaching, Thailand

Introduction

The content and Language Integrated Learning (CLIL) approach "is a dual-focused educational approach in which an additional language is used for the learning and teaching of both content and language. That is, in the teaching and learning process, there is a focus not only on content and not only on language. Each is interwoven, even if the emphasis is greater on one or the other at a given time" (Coyle, Hood, & Marsh, 2010, p.1).

The CLIL approach has now been adopted as an alternative methodology by English for Specific Purposes (ESP) teachers worldwide (Wahyuningsih, Widiati & Anugerahwati, 2016). CLIL and ESP approaches are target and students oriented (Ruiz-Garrido & Fortanet Gómez, 2009). The use of authentic materials embodying the content and language based on the target culture is emphasized in CLIL and ESP approaches (Mehisto et al., 2008; Trisyanti, 2009). In addition, they are interdependent approaches (Lavrysh & Halatsyn, 2018). While ESP is more promising to cope with students' linguistic challenges, it desperately needs CLIL components and vice versa (Alhasani, 2017).

However, CLIL in a class of ESP in the public relations (PR) domain is rarely implemented. Most CLIL research in the PR domain available at the time of this study is in the content subject courses, not ESP courses. Furthermore, most CLIL research mainly investigates the effects of the collaboration between content subject teachers and language teachers. The CLIL collaboration with domain experts outside the classroom has hardly been explored.

As a result, this present study aimed to construct the CLIL collaboration between the ESP teacher and the domain experts outside the classroom in an English for PR course offered for undergraduate students in Bangkok, Thailand, to expose students to the authentic content and language in the target culture.

The research questions for this study were:

1. To what extent does the collaborative CLIL teaching between an ESP teacher and the domain experts improve students' content knowledge, specialized language, and awareness of professional culture?
2. What are the opinions of students toward collaborative CLIL teaching?

This study filled the gaps in pedagogical PR research and the collaboration between ESP teachers and the domain expert, bridging a gap between theory and practice. The findings of this study may not be generalized. It may be limited to this specific context. Still, it can be used as a guideline for other teachers and researchers who may encounter similar contexts to this study.

Literature Review

Content and Language Integrated Learning (CLIL)

CLIL refers to the teaching approach in which the English language is used as a medium of instruction for a non-language subject, where both language and subject have a joint role. The emphasis is on the 4Cs framework, including content (subject matter), Communication (language learning and using), Cognition (learning and thinking process), and culture (intercultural understanding and global citizenship) (Coyle, Hood, & Marsh, 2010). The 4Cs were constructed from a holistic perspective for CLIL pedagogies to be developed and supported by different facets (Coyle, 2007).

To teach a content subject in a foreign language, CLIL is seen by many to be linked with established approaches such as English Across the Curriculum (EAC), Dual Language Immersion (DLI), Content-Based Instruction (CBI), and Cognitive Academic Language Proficiency (CALP) (Coyle, 2007; Coyle, Hood, & Marsh, 2010; Lin, 2016). In some perspectives, CLIL can be regarded as an umbrella term that covers instructional approaches geared towards content and language teaching (Marsh & Lange, 2000). These approaches imply that there are different models of CLIL. The distinction lies in the emphasis on the language-based or the subject-based (Coyle, 2007). On the other hand, CLIL can be regarded as an approach that can be distinguished from different approaches since both content and language are primarily emphasized in CLIL teaching (Dale & Tanner, 2012). The integration of contextualized content, communication, cognition, and culture yields the distinctive feature of CLIL teaching (Coyle, 2002).

As Coyle, Hood, and Marsh (2010) suggested, the successful CLIL implementation should also incorporate the Language Triptych (LT), which consists of the language of learning, language for learning, and language through learning. LT is "a conceptual representation connecting both content and language objectives. This conceptual representation provides a framework for analyzing the vehicular CLIL language from three interrelated perspectives, which are the components of the LT" (Martín del Pozo, 2016, p.144). According to Martín del Pozo (2016), while the language of learning refers to discipline-specific language, the language for learning includes the classroom language, language for academic processes, and speech acts in a foreign language environment. Language through learning refers to the new language required and acquired in the process of learning.

Mehisto et al. (2008) have identified CLIL's five essential characteristics to be implemented for an effective CLIL course. They are 1) *Authenticity*: authentic content and materials from real contexts; 2) *Multiple foci:* various activities undertaken to develop several skills of students leading to automatic skills simultaneously; 3) *Active learning:* teachers encourage students to engage in all learning activities; 4) *Safe learning environment:* familiar classroom environment and peer participation for students to feel secured and become more confident; and 5) *Scaffolding:* teachers to perform as a facilitator.

CLIL has multiple benefits for learners and other stakeholders. As Dale and Tanner (2012) identify, there are 12 benefits for learners. That is, CLIL learners "1) become motivated; 2) develop cognitively and their brains work harder; 3) develop communication skills; 4) make new personal meanings in another language; 5) achieve language progress more; 6) receive a lot of input and work effectively with that input; 7) interact meaningfully; 8) learn to speak and write; 10) develop intercultural awareness; 11) learn about the 'culture' of a subject; 11) are prepared for studying in another language, and 12) learn in different ways towards becoming multiple intelligences" (pp. 11-14). Regarding teachers and schools, according to Dale and Tanner, CLIL encourages the professional development of both content and language teachers; and builds an institution's international profile.

CLIL and ESP

There is much research in which the researchers call for the collaboration between CLIL and ESP (see, for example in Alhasani, 2017; Leshchenko, Lavrysh, & Halatsyn, 2018; Woźniak, 2017; Ruiz-Garrido & Fortanet Gómez (2009).

Tzoannopoulou (2015) implemented the 4Cs in an ESP Journalism course using authentic material, real-life tasks, scaffolding, project work, and collaborative group work. The findings revealed a higher level of students' motivation, learning, and engagement. Similarly, Al Amrani (2019) conducted CLIL in English for Telecommunications and Computer science, and CLIL yielded satisfactory results in language learning and did help increase students' motivation. Likewise, CLIL was also conducted in Chansri (2015) 's 12-week experiment in the EAP course experiment with agricultural undergraduate students. The findings reported that the students' English language abilities, sociocultural content, and cultural knowledge were enhanced with statistical significance.

CLIL in PR and Related Domains

There is evidence suggesting the effectiveness of CLIL in PR and related domains. For example, Baranova, Kobicheva, and Tokareva (2019) studied the implementation of CLIL in the International Business course in the department of Advertising and PR. Students were divided into two groups, CLIL and non-CLIL groups. The results showed that CLIL students had a higher level of motivation in studying the English language and a higher positive impact on their tests in English. Likewise, Peterson (2019) conducted a CLIL approach combined with mobile learning in a Business English course in the program of Advertising and PR. Various teaching methods were employed, such as presentations, business role-playing games, and the widespread use of authentic audio-video materials. The results revealed that the model contributes to the students' motivation, analytical skills, and critical thinking.

Methodology

Research Design and Framework

English for PR in this study is an elective course under the General Education administration offered at King Mongkut's Institute of Technology Ladkrabang (KMITL). The course can be attended by students from any faculties based on students' interests and availability. As a result, the present study used an entire group and a one-group pre-test-post-test non-randomized design, allowing the researchers to explore and fully understand the nature of the course.

CLIL's 4Cs – content, communication, cognition, and culture- were the main principles. However, because of the time constraint, all aspects except 'cognition' were investigated in this study. In this context, 'content' refers to the body of knowledge surrounding PR. Meanwhile, 'communication' covers all three main concerns of the LT, in which language of learning refers explicitly to specialized language practically employed in the PR industry and related fields. 'Culture' includes organizational cultures of in-house and agency, professional practices, intercultural communication, ethics, and values within PR and related fields. Besides, CLIL's five key characteristics – authenticity, multiple focus, active learning, safe learning, and scaffolding – identified by Mehisto et al. (2008) were also integrated into this collaborative CLIL course. Such an integration allowed students to earn the full benefits of the CLIL environment. A framework used in this present study is presented in Figure 1.

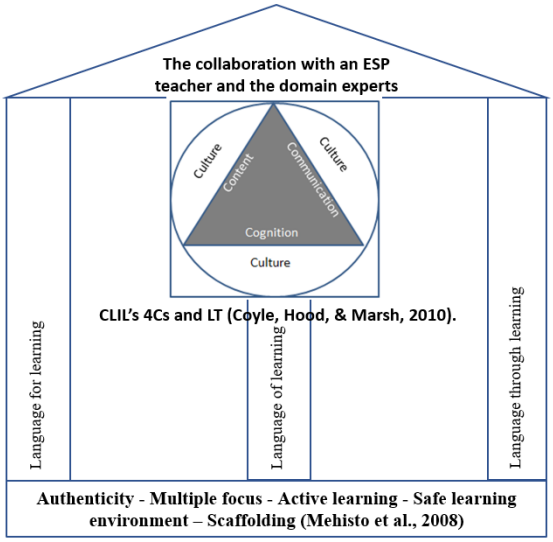


Figure 1 Framework of the Present Study

Figure 1 illustrates the framework of the present study in which the collaboration between an ESP teacher and the domain experts is at the top. CLIL's 4Cs lie at the heart while the language of learning is the central pillar of the classroom, accompanied by another two pillars: language for

learning and language through learning. Mehisto et al. (2008) are CLIL's five key characteristics are at the base as the foundation of this course.

Due to the Coronavirus outbreak in Thailand at the time of the present study, the English for PR course at KMITL was conducted online from the academic year 2019 till 2021. Therefore, data collection throughout this research was implemented using virtual meetings via Zoom application, phone calls, emails, and google forms.

Population and Sample

Students

As an elective course, the population of this study included the 1st to 4th-year students at KMITL. The study's sample group was the entire group of students who undertook the English for PR course during the 2nd semester of the academic year 2021, starting from January to April 2022. In the previous semesters, students in this course typically were from different faculties. Unexpectedly, all 42 students during the 2nd semester of academic year 2021 were the 2nd year students from the faculty of Agricultural Technology, majoring in four fields – Agriculture, Fisheries Science, Agricultural Communication, and Agricultural Development.

Table 1 Summary of Participants' Background

Profile	Category	N	Percent (%)
Gender	Male	7	35.0
	Female	13	65.0
Age	18	3	15.0
	19	15	75.0
	20	2	10.0
Year of study	2	20	100.0
Faculty	Faculty of Agricultural Technology	20	100.0
Major	Fisheries Science	9	45.0
	Agricultural Communication	3	15.0
	Agriculture	8	40.0
FE2	A (Excellent)	2	10.0
	B+ (Very good)	3	15.0
	B (Good)	7	35.0
	C+ (Fairly good)	3	15.0
	C (Fair)	2	10.0
	D+ (Poor)	1	5.0
	D (Very poor)	2	10.0

After the consent form was sent to all students, 20 students volunteered to participate in the study. The summary of the research participants' profiles is presented in Table 1. According to Table 1, most participants were female. They were from three majors – Fisheries Science (45%), Agriculture (40%), and Agricultural Communication (15%). Since they all had passed their two compulsory English courses: Foundation English (FE) 1 and 2, their FE 2 grade result was collected as part of the students' English background in year one. The English competency of

students in this elective course was diverse, ranging from the lowest' D' to the highest 'A'. Whereas most participants accounted for 35% had earned a grade B in their FE2 course, which can be defined as a 'Good′ level, according to the KMITL Office of the Registrar, forty percent of them were below a 'Good' level.

When asked at the beginning of the course whether students had prior knowledge of the PR domain, only students majoring in Agricultural Communication had earlier knowledge of PR and related fields since their major is more relevant to the PR discipline. One student cited a friend's recommendation, and others stated their interest when asked for reasons for pursuing this course. Concerning the importance of English, they all were fully aware of how significant the English language was to them. However, most of them clearly stated that they were not confident in using English since they rarely had a chance to use it, and some were embarrassed by their peers bullying them when they misused English.

Professionals from PR and Related Fields

Professionals were recruited according to the research's criteria and availability. The research's criteria are that professionals' communication medium at their workplaces must be English. They must work in their specialized fields for more than five years before this study so that they are thoroughly familiar with the PR industry and related disciplines and can provide suggestions in terms of both content and specialized language. This study's PR and associated field professionals included four professionals from different established companies. They possess extensive experience in PR and related disciplines, such as crisis management, strategic planning, media relations, KOLs, content creation, and journalism.

ESP Teacher

An ESP teacher, who was also one of the researchers in this study, has been teaching for six years at the Faculty of Liberal Arts, at KMITL, at the time of the study. She had ten years of experience working in the PR industry and related fields. However, since she had already left the industry, her knowledge of PR and related disciplines may be outdated.

Course Development

Since an English for PR course has been offered for some time at KMITL. As a result, the materials and activities in the previous semesters can be used as a baseline. In addition, to increase authenticity, the ESP teacher also built specialized corpora in October 2021, which contained research articles related to PR fields and press releases collected from established companies' websites. While the findings are based on press releases, the corpus analysis revealed frequent use of exaggerated forms and presented simple and descriptive adjectives. Words often used in the PR field, such as lobbying, spin, pitch, publicity, campaign, etc., the findings from the PR-related research corpus yield exciting topics to be discussed in the class, such as crisis management and global PR.

In November 2021, the ESP teacher started to invite domain experts. Once a group of PR professionals and related disciplines confirmed participation, numerous meetings were conducted. The lesson plan and teaching materials were sent back and forth between ESP teachers and professionals for reviews and feedback.

The final lesson plan consisted of eight units: 1) Introduction of PR, 2) Ethics and Regulations, 3) Media Relations and KOLs, 4) PR Event Planning, 5) Press Release (Traditional Media), 6) Content Creation in PR (New Media), 7) PR Crisis management, and 8) International and global PR.

The collaboration with the domain experts significantly contributed to the authenticity of the content and the materials. For example, content creation, especially on new media, is one of the topics with which the ESP teacher is most unfamiliar. Yet a content creator job is closely relevant to the PR discipline and was currently in high demand in Thailand at the time of the study; therefore, equipping students with this knowledge may increase their employability. With the guidance of professionals who are experts in this field, the ESP teacher was able to find suitable materials corresponding to real-world practice.

Collaborative CLIL Course

Table 2 Sample of Lesson Plan

Unit	Content focus	Language Focus	Class activities
Unit 5: Press Release (Traditional Media)	- Different types of press release - Structure of press release - Regulations and ethics	- Language of learning (descriptive adjectives, comparative and superlative) - Language for learning (transitions) - Language through learning (students acquired when searching for info during class activities)	- Vocabulary exercise - Grammar exercise - Reading comprehension exercise - Discussions - Writing press release headline

The collaborative CLIL course was implemented online for 15 weeks using the Zoom application. A sample of a lesson plan is shown in Table 2. As seen in Table 2, both content and language were primarily emphasized. The theme in this unit is about developing a press release. In the class, students were also shown how press releases were covered in both online and print media. As for the language focus, before being taught how to write a PR headline, students were introduced to a *PR News* section on the *Bangkok Post* newspaper's website, one of Thailand's two leading English newspapers. They were then divided into small groups, and each group chose one press release, analyzed how the headline was constructed, and then shared their ideas with the class. Students were encouraged to ask questions and the ESP teacher closely observed them if they encountered problems and needed any assistance.

At the end of the semester, students were also assigned to form a small group, simulate a small press conference, and create talking points, agenda, and possible questions and answers. While each group was presenting, the rest of the students performed the role of journalists asking questions to keep all students engaged and motivated.

One PR professional specializing in crisis management was invited to *Unit 7 PR crisis management* week. The class started with an introduction to specialized terms and the basic workflow of crisis management. The authentic crisis cases were introduced, and students were encouraged to share their solutions to each case, as a whole class activity, without receiving feedback from the teacher. After that, the PR professional shared his/her knowledge based on real-world practical expertise. Then, students were divided into small groups. Each group was given the case studies again, which included both new cases and some already-seen cases, but this time students could apply the knowledge learned from a guest speaker. Afterward, each group was asked to present their ideas, and the PR professional and ESP teacher gave feedback.

Through these activities, students' 4Cs and LT were promoted, and the activity also offered authenticity, multiple focus, active learning, a safe learning environment, and scaffolding.

Data Collection

Students were pre-tested in the first week and post-tested in the final week. Students' opinion evaluation questionnaires and semi-structured interviews were also conducted at the end of the course.

Pre-post-tests consisted of 60 items divided into three main parts: part 1, PR content; part 2, PR specialized language; and part 3, awareness of professional culture. The first two parts were multiple-choice achievement tests, while the third was designed as situational judgment tests.

The students' opinion evaluation questionnaire was based on Chansri (2015), which was adjusted to fit the context of the present study. The questionnaire comprised three main parts: part 1, students' personal information including sex, age, major, and faculty; part 2, students' opinions towards the collaborative CLIL teaching in the areas of course's objectives and content of the course, teaching materials, teaching methodology and activities, and evaluation; and part 3 students' additional comments about the course. Apart from the questionnaire, a semi-structured interview was employed for triangulation.

All research instruments were validated by three experts using the index of Item Objective Congruence (IOC index) and were pilot tested for another validation and improvement. Data collected from pre-post tests and parts 1-2 of the questionnaire were analyzed using the SPSS program for descriptive statistics. In contrast, data collected from the open-ended questions in part 3 of the questionnaire and the semi-structured interview was analyzed using content analysis approach.

Findings and Discussion

Research question 1: To what extent does the collaborative CLIL teaching between an ESP teacher and the domain experts improve students' content knowledge, specialized language, and awareness of professional culture?

Table 3 Pre-post-test Results of Content, Specialised Language, and Awareness of Professional Culture

Topics	$\bar{x}$ *(SD)*		*Mean differences*	*t.*	*df*	*Sig. (2-tailed)*
	Pre-test	**Post-test**				
1. PR content	7.75 (2.693)	14.50 (3.035)	-6.750	-15.322	19	.000***
2. PR specialized language	9.00 (3.756)	13.35 (1.565)	-4.350	-6.418	19	.000***
3. Awareness of professional culture	10.15 (1.725)	16.35 (2.231)	-6.200	-15.203	19	.000***
Overall scores	**26.90 (7.312)**	**44.20 (6.040)**	**-17.300**	-24.848	19	.000***

***p<0.001

Table 3 illustrates the effectiveness of collaborative CLIL teaching findings based on the pre-post-tests containing a total score of 60, and each part carries 20 marks. From the table, the post-test total mean score ($\bar{x}$ = 44.20) was higher than the pre-test mean score ($\bar{x}$ = 26.90) with a significant level of p<.000. There was also a significant difference in all three parts in both pre-post-tests.

Nevertheless, when looking into details, students' scores of PR content knowledge appeared to be slightly lower ($\bar{x}$ = 7.75) than the other two parts during the pre-test phase. It may be expected because all students enrolled this semester were from Agricultural Technology and only three were from Agricultural Communication. Hence, the PR content subject may be relatively unfamiliar to most students. Yet, the primary point is that the mean score was improved significantly in the post-test result.

Regarding student's specialized language, the post-test mean score ($\bar{x}$ =13.35) was slightly lower than the other two parts. It may suggest that the difficulty of specialized language in this course might pose some challenges to this group of students in which 40% had previous English background below 'Good' level.

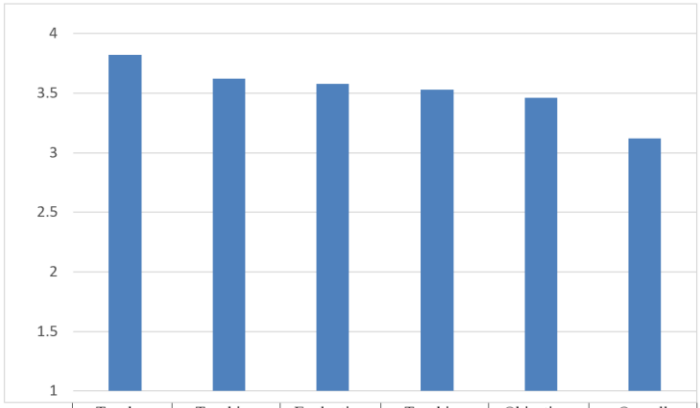
Awareness of professional culture's mean score was the highest in both two phases ($\bar{x}$ =10.15 and $\bar{x}$ =16.35). It might be because professional culture involves some commonly known aspects such as journalism ethics and standards, racism, and gender issues. Students may have some prior knowledge from reading news articles about these issues.

The fact that the overall mean score was not very high may be mainly due to the students' English proficiency since the pre-post-tests were all in English. It could constitute a challenge for some students.

Nevertheless, it was clear that the CLIL model in this study successfully enhanced students' academic achievement in both content and language, as well as awareness of professional culture.

Research question 2: What are students' opinions towards collaborative CLIL teaching?

In this part, the participants were asked to rate the level of opinions based on a four-point Likert scale ranging from *Strongly agree* to *Strongly disagree*: $\bar{x}$ = 3.25-4.00 means 'Strongly agree', $\bar{x}$ = 2.50-3.25 means 'Agree', $\bar{x}$ = 1.75-2.50 means 'Disagree', $\bar{x}$ = 1-1.75 means 'Strongly disagree', according to the statistic formula. Descriptive statistics are demonstrated in Figure 2. The six bars represent six categories of collaborative CLIL teaching. Variables were arranged in descending order from left to right based on their means. The six categories were generally similar, ranging from 'Agree' ($\bar{x}$ = 3.12) to 'Strongly agree' ($\bar{x}$ = 3.82). Only the overall impression was rated 'Agree', while the rest was rated 'Strongly agree'.



	Teacher and guest speaker	Teaching methodology and activities	Evaluation	Teaching materials	Objectives and content of the course	Overall impression
$\bar{x}$	3.82	3.62	3.58	3.53	3.46	3.12

Figure 2 Means of Students' Opinion Questionnaire in Each Category

A semi-structured interview was also conducted to gain more insight and a greater depth of information. Five students volunteering for an in-depth interview phase included two students from Fisheries Science, two from Agricultural Communication, and one from Agriculture. A one-on-one interview was held via Zoom meeting to elicit their opinions towards the collaborative CLIL teaching

The findings from the quantitative and qualitative phases revealed that students rated 'teacher and guest speaker' the highest since they found the ESP teacher approachable and helpful throughout

the semester. They also enjoyed a class attended by a professional, as evident in the following two excerpts:

1) *You (ESP teacher) gave us a lot of advice about the PR field and shared your experiences with us. I enjoy this class so much even though I didn't speak out that much in the class, but I just want to let you know that I always listened to what you said in the class.*
2) *I think inviting a professional to the class on certain topics really helps contribute to learning, and all class activities allowed us to practice the real-world scenario.*

It can also be implied from the above excerpts that this collaborative CLIL teaching has contributed to students' motivation and engagement, as also reflected in the following sentiment:

3) *I like everything in this course. The content didn't stress me out. I think I have made the right decision to take this course. I have never felt lazy waking up in the morning for your class. All the knowledge, content, and handouts given by the teacher are useful. And I also like your teaching style. This course is the first one that made me love studying.*

Overall, students were satisfied with the course. They all found teaching methodology and activities highly enjoyable. In addition, students strongly agreed that group work had contributed to their individual work. One student expressed his/her preference for class discussions as he/she could learn from peers, and the discussions did improve her critical thinking. Students also found the teaching materials in this course authentic, useful, and interesting.

On the contrary, although most students strongly agreed that activities and exercises of each unit were suitable for their English background knowledge, some students may find the content otherwise, as evident in the following excerpt:

4) I was frightened at first after knowing that all PR content was in English. However, the class activities combined with the teacher's detailed explanation gradually enhance my understanding.

Furthermore, the overall impression was rated only at 'Agree' level. Even though, all participants indicated that they would recommend this course to their friends, some of them still perceived that this course did not contribute much to their future studies and careers. However, all Agricultural Communication participants found this course useful to their further studies and future careers. One comment was worth to be acknowledged here.

5) Although it turns out that PR is not my favourite thing, but you have helped me see my own choices in the future more clearly.

This course helped open the worldview of students' future choices even though they might not pursue the PR career path.

In summary, the findings suggested effective collaborative CLIL teaching between ESP teachers and the domain experts in students' content knowledge, specialized language, and awareness of professional culture. Students, overall, were motivated and engaged throughout the semester. They also found this course useful, although some students may be unable to find the link to their further studies and future careers.

Conclusion

The research study illustrated how ESP teachers and professionals from PR and related fields could work together to construct a CLIL environment in an ESP course. The group of domain experts in PR and related fields has made several significant contributions, especially to the authenticity of the content and language. Hence, the findings corresponded with the course's primary goal, in which students were exposed to the authentic content and language in the target culture.

The pre-post test results indicated that the collaboration and the use of CLIL's 4Cs, LT, and five key characteristics have contributed to the students' academic achievement since students had a deeper understanding of a target content and language. The awareness of professional culture was also embedded in all units, along with several different authentic case studies in which students were encouraged for discussions to develop their critical thinking. However. the overall mean score at the post-test ($\bar{x} = 44.20$) may be deemed not a very high level when compared to the total score of 60, but when the students' previous English background was taken into account, the increase almost doubled from the pre-test ($\bar{x} = 26.90$) can be regarded as an indicator of the students' significant improvement.

Moreover, students' motivation and engagement were greatly enhanced. Students enjoyed the authentic content and were satisfied with the ESP teacher, the guest speaker, class activities, and materials.

This research filled the gap in an area of pedagogical PR research by highlighting the collaboration between language teachers and domain experts outside the educational setting and bridging a gap between theory and practice.

Implications

Collaborating with the domain experts outside the educational setting to create a CLIL environment is encouraged, yet with the following suggestions:

1) Although some students found the language in this course challenging, lowering the difficulty level to ease some students' concerns would not be an ideal solution. Instead, scaffolding and creating safe learning were encouraged and must be given to motivate the

use of the English language. Coyle, Hood, and Marsh (2010) suggested that new vocabulary, grammar, and concepts related to the content subject should be introduced through the supported or scaffolded approach.

2) In this research, some students could not find the connection of this course with their further studies and future careers. This issue should be addressed in future courses by selecting PR case studies more relevant to students' fields of study.

Limitations

This study's first and foremost limitation is that English for PR is an elective course. This course is open to students from all faculties, making it difficult to control their learning outcomes since students will typically come from different backgrounds, especially different levels of English proficiency. Even though it was clear that the CLIL collaboration between the ESP teacher and the domain experts yielded positive results this semester, the results may be slightly different in the future semester.

Furthermore, the ESP teacher in this research also had long and extensive experiences in PR and related domains. Thus, the findings of this study may not be generalized, but they can be applied as a guideline for those researchers and teachers who happen to have similar contexts.

Recommendations

Several recommendations were drawn from the present study. Firstly, the investigation in further studies can cover all CLIL's 4Cs. Alternatively, the students' cognition could be raised as the main topic for quantitative and qualitative examination.

In addition, the students' reference to their insecurity in using English in this research may lead to further research of CLIL in an ESP course focusing on promoting students' self-efficacy.

Corpus linguistics also provided insightful information during the course development process. Therefore, other researchers and teachers may adopt the corpus linguistics combined with the CLIL approach in their own context.

Furthermore, the findings may be limited to the expertise of professionals participating in the study. Further research may yield different results should other PR-related professionals, such as journalists and influencers, participate in the study.

In terms of research instruments, researchers are encouraged to use other tools such as learning logs, a diary, and observation to gain a deeper understanding of students' learning.

Finally, a collaboration between ESP teachers and domain experts outside the educational setting is highly recommended and should not be limited to PR ESP courses. All ESP and CLIL courses may adopt this practice to increase courses' authenticity and students' motivation.

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Creating a Research Culture in a Dominican University: Perspectives and Productivity of the University of Santo Tomas Legazpi Faculty

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ABSTRACT

In the Philippines, one of the requirements and mandates of faculty members teaching in Higher Education Institutions (HEIs) is research. Together with instruction and community extension, this forms the trifocal function. Research paves the way for collaboration and efficient knowledge generation, complementing instruction and community extension. As a developing country, the need and expectations for faculty members to conduct research in various HEIs in the Philippines have grown exponentially, and the need for quality has been imperative. In this study, the research culture at the University of Santo Tomas-Legazpi, a Dominican university, was assessed and evaluated along a) research administration, b) research policies, c) research incentives, d) research publications, e) research awards and recognitions, and f) research linkages utilizing a mixed methodology and employing a survey questionnaire (n=77). Other critical documentary data, such as the number of publications, were included in this research. Only one (research administration) out of six (16.67%) research areas assessed registered a cumulative rating higher than 4.00. Other areas reported the following ratings: research linkages (3.96), research publications (3.90), research awards and recognitions (3.87), research policies (3.82), research incentives (3.82). Further analysis revealed possible interventions for improvement might include i) a review of existing research policies and procedures and ii) justifiable workload distribution for faculty members. Together, all these areas play a pivotal role in advancing the frontiers of research and cultivating a culture that research is essential in HEIs

Keywords: research culture, institutional, research, Dominican university

Introduction

In the Philippines, the mandated function of the Higher Education Institutions (HEIs) faculty is trifocal (Peñaredondo-Untong, 2020). These functions include teaching, research, and community extension (Quitoras & Abuso, 2021). These tasks are conventionally touted as the trio of workplace duties for faculty, so finding a balance between research, teaching, and service is pivotal for a successful and satisfying career (Kuntz, 2012, as cited in Ismayilova & Klassen, 2019). Newsome et al. (2021) also stated that faculty are required to provide teaching and service and have a minimum expectation for scholarly productivity. As a result, academic institutions strive to deliver their best services through their trifocal function to gain national and international recognition.

As countries in emerging economies race to improve their international standards in education, there is a growing realization that this cannot be done without a specific place for research (Sigué, 2012, as cited in Darley & Luethge, 2016). Through the years, research has gained its pivotal role in the academic arena. Research and development are now deemed very important in an educational setup, leading to a nation's overall progress and growth (Sultana, 2019). In a developing country like the Philippines, HEIs are encouraged to conduct research and other scholarly investigations in various academic disciplines to generate and disseminate knowledge (Commission on Higher Education, 2008). Peñaredondo-Untong (2020) even specified that teaching and research constitute a continuum of academic activity, so it is an academic obligation to undertake research. However, the onerous obligation to produce quality education through research remains a massive challenge for developing countries (Kyaw, 2022). Despite the challenges, universities have a significant role in driving nations' research and innovation to secure future prosperity (Watt & Richardson, 2020).

Research Culture

Every academic institution has a robust need to conduct research. It is a university's key role to facilitate the pursuit of knowledge which invariably leads to research (Sultana, 2019). Through this pursuit, a sustainable research culture must be established. According to Evans (2012), research culture refers to shared values, assumptions, beliefs, rituals, and other forms of behavior geared toward acknowledging the value of research practice and its outputs (as cited in Olvido, 2021). Hence, it is crucial to highlight the significance of research as an integral aspect of higher education to keep the research culture alive. The value of research knowledge is to inform action, gather evidence for theories, and contribute to developing knowledge in a field of study (Arza & Vazquez, 2012; Perkmann et al., 2013; Zarah, 2022) must be cultivated within the members of a university. In this way, the institution will be constantly immersed in quality research that leads to innovation, encompasses relevance, creates impact, enhances teaching (Ho, 2014), and often highlights various societal issues (White, 2021). A research culture also provides a supportive

context in which research is constantly expected, discussed, produced, and valued (Hanover Research, 2014).

The road to established research culture in a university requires time and effort. According to Peñaredondo-Untong (2020), SUCs must create a healthy research culture to invite the faculty members to perform at a high level on their research-mandated function. Indeed, the first step to achieving a sustainable research culture begins with the leadership of research administration and the implementation of research policies. The role of the research leaders is invaluable in the research productivity of an institution because they are the ones who plan and strategize to carry out their research goals (Quitoras & Abuso, 2021). Establishing clear policies will guide research activities, training, and support services (Sherab & Schuelka, 2019). In addition, different offices work hand in hand towards this goal of establishing a vibrant research culture (Ateneo de Naga University, 2022). In this fashion, the productivity of the faculty in the trifocal function, especially research, will be maximized because the university puts a premium on research in its current undertakings and craft policies that are well-defined, fair, and relevant to the research needs of its constituents.

HEI's leaders should also encourage and support research activities that reinforce outstanding teaching and learning (Ho, 2014). These activities, namely paper presentations, journal publications, and research awards, immerse the faculty in their academic career's limitless benefits of research. It will aid the faculty in nurturing their potential and achieving goals by taking advantage of various opportunities in research (Zarah, 2022). Moreover, a set of guidelines covering research incentives for presentation, publication, and awards is imperative to acknowledge the effort and hard work of the faculty. The institution should support and sponsor participation in conferences for faculty and even host its own conferences (Hanover Research, 2014). In connection to this, the greatest rewards (such as tenure and promotion) flow to those faculty who are most active in research and publishing scholarly work alongside engaging in teaching and service activities (Watty et al., 2008 as cited in Ismayilova & Klassen, 2019). Thus, faculty members with rich and active research backgrounds are often perceived as powerful educators (Chen, 2015; Alralah, 2016). Faculty with 30-40 years of experience frequently attain the highest research productivity (Nafukho et al., 2019).

As the faculty members become more proficient in research, the opportunities may go beyond the institution's four walls. According to Quitoras and Abuso (2021), faculty members should be encouraged not just to produce research in their respective disciplines yet through collaboration as well to elevate research to the next level. These collaborations lead to established research linkages with other HEIs and institutions. Thus, high-impact and long-term types of research will be produced, which will benefit not only the institution but the entire nation as a whole. All these elements, such as robust research administration, sound research policies, excellent research publication track record, availability of research grants and incentives, acknowledgment of

research performance, and strong research linkages, contribute to sustainable research culture. Indeed, developing research culture is an investment (Olvido, 2021) that requires constant monitoring and breaking of barriers.

Research Culture Barriers

Existing literature indicates there are still barriers to achieving an ideal research culture. Research efforts are still hampered by difficulties such as funding (Darley & Luethge, 2016). The lack of proper funding and support and adequate research facilities continue to be a barrier to the productivity of faculty members (Alralah, 2016; see also Masinde & Coetzee, 2021). These should be addressed with research grants by funding agencies and increased institutional funds for research. It also remains a demanding responsibility for the faculty members to maintain the trifocal function of the university. In a study by Peñaredondo-Untong (2020), the faculty members of the SUCs in Region XII of the Philippines spend much of the time and effort on their mandated instruction function, less on extension services, and least concern on research. Many faculty members are challenged by competing factors of scholarly productivity, research, and service obligations (Newsome et al., 2021). There is also a growing number of faculty members with other priorities and individual needs beyond their roles as educators. According to Brown & Masten (1998), many faculty have neither the time nor the incentive to assume research activities outside of the classroom as they often work part-time jobs to supplement their low university salaries (as cited by Darley & Luethge, 2015). They have some individual needs that need to be met to motivate them to take up research (Alrahlah, 2016). Moreover, some faculty members only view research as a professional requirement. It is understandable, though, that some faculty members pursue research to bolster their reputations and achieve promotion and tenure (Ho, 2014).

Research Perspectives and Productivity

Several studies in Asia and Australia about research perspectives and faculty productivity have been published recently to break the barriers and keep the research culture alive in their respective institutions. In an exploratory study by Alralah (2016), the 21 dental faculty members in KSA identified the following needs for improving research productivity through a semi-structured individual in-depth interview: a) reasonable remuneration, b) adequate research facilities, c) funding for research, and d) support. Some researchers also showed a greater need to increase their research productivity to improve their status in the global academic community. This study strongly suggested that research productivity can be enhanced with a clear and detailed motivation plan. On the other hand, no quantitative data were provided to support the link between faculty members' motivation and research productivity.

In a mixed-method study by Ismayilova and Klassen (2019), the findings showed that self-efficacy in research varied according to career stage and qualifications. Still, teaching was the strongest

predictor of job satisfaction. This study showed a strong evaluation of research productivity in two developing countries (i.e., Azerbaijan and Turkey) where university resources are relatively limited compared to other western countries. However, the sample came from 25 universities in two countries before the COVID-19 pandemic, which may have a different influence on faculty members' self-efficacy and job satisfaction.

Another study by Watt and Richardson in Australia (2020) found that academic goals are distinct in teaching versus research domains, and increased satisfaction and reduced stress are associated only with the teaching domain. There is also a significantly higher rating of self-efficacy in teaching than in research caused by a lack of institutional support and heavy workloads (Villarino & Cagasan, 2012). This study discussed four significant theories of motivation that could broaden the views that could be applied to understanding academics' perspectives and productivity in research. However, the studies included in the commentary were all conducted outside the Philippines. Considering the possible role of culture in academics' motivation and differences in university policies and structures, the same findings may not apply to the Philippine context.

Next, Newsome et al. (2021) formed a collaborative team in their study, showing success in the three education domains. Developing meaningful mentor-mentee relationships within the team seemed to help mitigate burnout and increase faculty engagement in their trifocal function, especially research. The study indicated that a group of passionate professionals could focus on all three primary academic pillars and sustain favorable results in three years. Nonetheless, the collaborative team was only tested in its first three years in Georgia. Outcomes must also be reported in the succeeding years to understand their long-term implications.

These researches show that achieving a healthy research culture and ensuring research productivity among faculty entails a comprehensive strategy and initiative from an institution. In recent years, the University of Santo Tomas-Legazpi (UST-Legazpi) has initiated many efforts to become a research university. As the university placed more importance on research, all the faculty from Basic Education up to Tertiary Level are now required and capacitated to produce their own research works (UST-Legazpi Research Manual, 2018). Through the years, the fostering of a research culture has been a continuous endeavor of UST-Legazpi. With this current undertaking, the Office of Research Team is determined to examine views about research and research efficacy of UST-Legazpi Faculty. As the team primarily monitors and encourages the significance of research work in the university, this study helped them champion research more based on the needs of the academic community members. Therefore, the study objectives were to analyze the research perspectives and determine the UST-Legazpi Faculty's research productivity for the past five years.

This study aimed to assess the research culture at the University of Santo Tomas-Legazpi from 2015-2020. Specifically, it aimed to:

1. Derive narratives to establish faculty perspective on research in the academe;

2. Assess the university research culture along a) research administration, b) research policies, c) research incentives, d) research publications, e) research awards and recognitions, and f) research linkages
3. Propose measures for the continual improvement of the research culture in the university

Methodology

This study utilized a mixed methodology based on Ismayilova and Klassen (2019) research. A quantitative approach was chosen to assess and evaluate the construct measures supporting a sustainable research culture. In this phase, a survey questionnaire was developed to gather relevant data. A qualitative method was selected to deepen the narratives of faculty perspective and productivity on research. For this phase, critical documentary data, such as the number of publications, incentives, and awards from 2015-2020, were employed in this research.

Participants

Participants were 77 faculty members from the University of Santo Tomas-Legazpi who completed a survey questionnaire on research culture and research perspectives, and productivity. The faculty for AY 2021-2022 who participated in the study were equally represented by the Basic Education Department (51.95%) and Tertiary Department (48.05%).

Questionnaire

The questionnaire was grounded on Alralah's (2016) study and focused on the following parameters: a) research administration, b) research policies, c) research incentives, d) research publications, e) research awards and recognitions, and f) research linkages and awards. Seventeen questions were developed on the abovementioned parameters, and six (6) questions on personal research.

Procedure

Participants were invited to answer the survey through an email distributed to each university academic unit. They were asked to complete a brief online survey on research culture and perspectives and productivity on research as a faculty member. The participants also signed informed consent documents before the survey was administered. The Office of Research also evaluated the publication track record, incentive granted, and awards received by the participants in the field of research from 2015-2020 to add depth to the quantitative data. This study was conducted per the ethical consideration related to the confidentiality and anonymity of the participants.

Data Analysis

Data and statistical analysis were done, and relative means were computed for each parameter and compared for the functional areas assessed. Other critical documentary data, such as the number of publications, incentives, and awards from 2015-2020, were also recorded and discussed. The results proposed measures to address gaps identified to further the university's research culture.

Results and Discussion

This section discussed the construct measures supporting a sustainable research culture and the perspectives and productivity of faculty on research.

Research Administration

Good research culture in any institution is an office or a department that caters to all research endeavors like publication, grants, and other analogous services (Quitoras & Abuso, 2021). A mean rating of 4.15 was observed for research administration, corresponding to an adjectival rating of "satisfied".

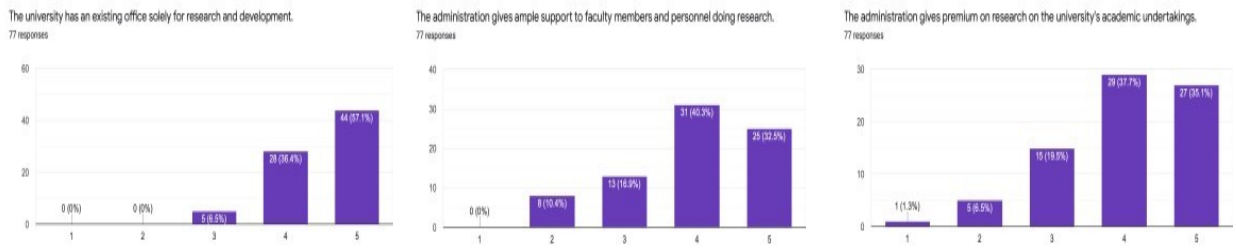

Figure 1: Results on Research Administration (n=77)

Data suggests (Figure 1) that UST-Legazpi has an existing and functioning research office solely for research and development. It ensures that the university gives ample support to faculty members doing personnel research, whether they may be classified as faculty or member of the non-teaching personnel. Furthermore, mean ratings of 3.94 and 3.98 were recorded for the university's support and giving premium to the conduct of research of its employees, respectively.

Research Policies

Systems and procedures must be in place, with an office solely overseeing and supervising the university's research endeavors. Systems and procedures are essential in ensuring that all steps and processes are correctly executed. It also ensures that the system has existing controls in place to eliminate biases and errors that may arise during implementing of the system's processes (Kyaw, 2022).

With a mean rating of 3.82, UST-Legazpi employees are satisfied with the existing research policies of the institution (Figotr 2). However, it is worth noting that a review be conducted on the relevance and fairness of the research policies relative to the mandated existing workloads of the faculty members as reflected in the dismal 3.34 rating garnered in this particular parameter. Studies have shown that one of the main reasons faculty members in higher education institutions in the Philippines have difficulty conducting research is because they tend to be overwhelmed with tasks on instruction and other facets of employment (Villarino & Cagasan, 2012). Many faculty members are also challenged by competing factors of scholarly productivity, research, and service obligations (Newsome et al., 2021).

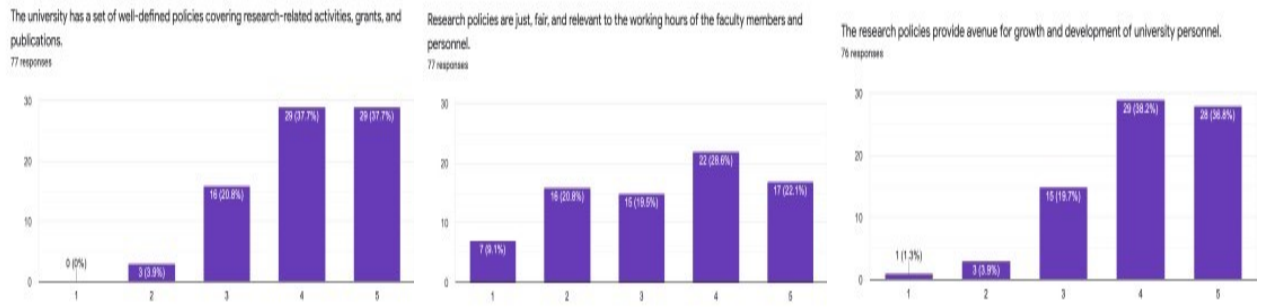

Figure 2: Results on Research Policies (n=77)

Research Incentives

While conducting research may be overwhelming and lackluster for some, higher education institutions have devised several ways to increase research productivity and research production; this includes research incentives (Quitoras & Abuso, 2021). Incentives may include financial, in-kind, gifts, bonuses, or even leave credits (Compensation & Reimbursement of Research Participants | Research & Innovation, 2019).

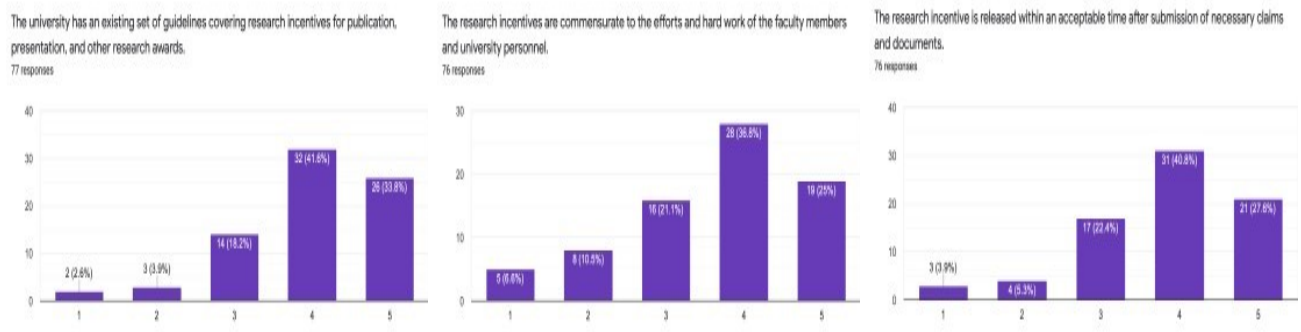

Figure 3: Results on Research Incentives (n=77)

Figure 3 reveals that UST-Legazpi employees are satisfied with the existing research incentives of the university, with a mean rating of 3.82, corresponding to a "satisfied" adjectival rating. Incentives of the university include publication incentives in the form of cash incentives and research presentation grants. Research publications and presentations are also given proportional weights and bearings in promoting non-academic or academic employees. It is worth emphasizing that incentives are one of the top motivators in research and a wide array of services and productivity (Masinde & Coetzee, 2021).

Research Publications

Over the millennia, research productivity in higher education institutions has been widely measured by the number of research publications produced by a specific institution. It is often one of the critical metrics in school rankings, whether local, national, or international (Chen, 2015). Some institutions have already started placing a minimum number of publications per year for their faculty members. USTLegazpi has its own international publication to which employees can submit their papers for publication. Aside from this, faculty members are encouraged to publish their papers in reputable journals locally and internationally.

Research Awards and Recognitions

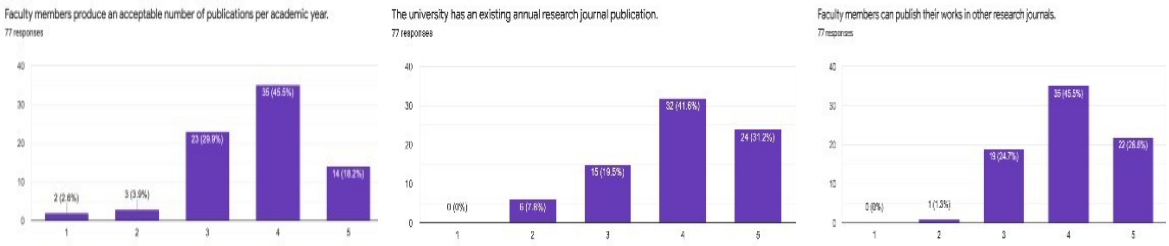

Figure 4: Results on Research Publications (n=77)

Research undertakings with national and international recognition are a good sign of a well-developed research culture in any university (Olvido, 2021). UST-Legazpi faculty are generally satisfied with the awards and recognitions the university receives, as justified by the mean rating of 3.81. The study also garnered a mean rating of 3.78 for the parameter on faculty members being awarded external research grants, which translates to UST-Legazpi being recognized as a vital partner for funding agencies and institutions in research.

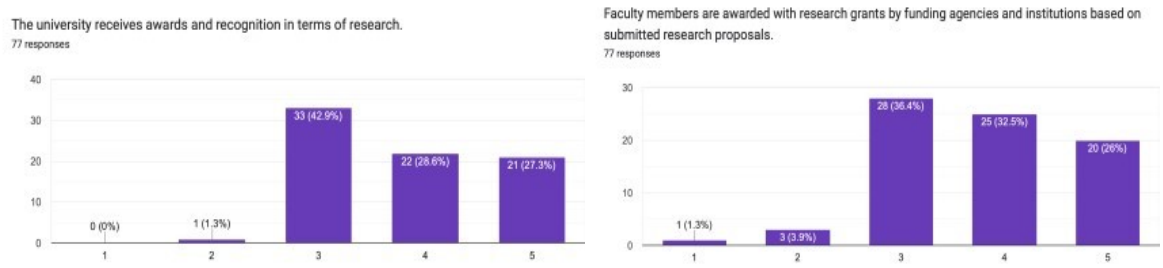

Figure 5: Results on Research Awards and Recognitions (n=77)

Research Linkages and Networks

The success of research engagements and projects depends on the established research linkages a university has shown through the years (Perkmann et al., 2013). Establishing research linkages ensures that various fields of specialization and expertise from different universities and institutions are highly utilized to complete a particular project or research endeavor (Arza & Vazquez, 2012).

Figure 6: Results on Research Linkages and Networks (n=77)

The university's linkages and networks with other HEIs and institutions have benefited and impacted the university's academic workforce, as justified by the 3.96 rating, which translates to the satisfaction of the faculty members regarding the existing linkages and networks that the university has sustained and maintained throughout the years.

Personnel Research

Out of the 77 respondents, only two (2) respondents have published five (5) to seven (7) research publications in the last 10 academic years, while the rest of the respondents have published two (2) or fewer research publications in the said time frame. This result reflected the Nafukho et al. (2019) study that faculties with 30-40 years of experience frequently attain the highest research productivity.

Only one (1) of the 77 respondents has been awarded research grants not more than five (4) times, while the rest of the respondents only had two (2) or fewer. On submission of research proposals to the university, three (3) respondents have submitted five (5) to seven (7) research proposals, and six (6) have submitted three (3) to four (4) proposals. In contrast, 68 have submitted two (2) or fewer to the university. Only two (2) of the respondents have submitted research proposals to funding agencies outside the university, while the rest have submitted not more than two (2) research proposals. Given the low number of research proposals in the university, faculty members should be encouraged not just to produce research in their respective disciplines yet through collaboration as well to elevate research to the next level (Quitoras and Abuso, 2021).

Three (3) out of the 77 respondents have received incentives from the university for three (3) or four (4) of their research, while the rest have received incentives for not more than two (2) of their research. Lastly, only two (2) respondents have received research incentives from funding agencies outside the university for three (3) or four (4) of their research. In contrast, the rest received incentives for not more than two (2) of their research. These low figures reflect how research efforts are still hampered by difficulties such as funding (Darley & Luethge, 2016).

Considering the various ratings on the parameters examined and assessed, the following can be suggested to improve the research culture of the university further:

1. **On research administration:** it is recommended that the office be expanded to utilize the existing resources of the university fully;
2. **On research policies**: a thorough review must be made to ensure that all existing policies are just, fair, and relevant to the changing times;
3. **On research incentives:** incentives must be adjusted based on the results of the thorough review of research policies;
4. **On research publications:** as one of the significant requirements of teaching at the tertiary level, more publications must be produced by faculty members, focusing not only on quantity but also on the quality and credibility of the research publications;
5. **On research awards and recognitions:** research outputs from the faculty should be sent to more national and international conferences to promote more opportunities for recognition and strengthen the university's credibility as a research partner to external funding agencies and institutions; and
6. **Research linkages and networks suggest** that all associations be sustained and maintained for continual improvement and future research collaborations.

Conclusion

The following conclusions are as a result of this derived:

1. Some faculty members still view research as a professional requirement and not as means for the overall progress and growth of the institution. It is understandable, though, that some faculty members pursue research to bolster their reputations and

achieve promotion and tenure (Ho, 2014). Faculty members are also challenged to do research by overwhelming tasks on instruction and other facets of employment. Publication incentives and research presentation grants enhance the faculty member's research productivity as one of the top motivators to carry on with their research.

2. Regarding the university's research culture, only one out of six assessed research areas registered a cumulative rating higher than 4.00. The mean ratings of the research areas are as follows: research administration (4.15), research policies (3.82), research incentives (3.82), research publications (3.90), research linkages (3.96), and research awards and recognitions (3.87). The mean ratings in all areas correspond to an adjectival rating of "satisfied".
3. Continual improvement of the research culture in the university needs improvement in all six research areas assessed by the study. An office expansion would significantly boost research administration to utilize the university's existing resources fully. A review of whether the existing research policies are relevant to the changing times must be done, precisely the policies on the faculty members' mandated workloads. A thorough review of the said policies should also help determine whether the research incentives offered by the university would also need to be adjusted. Faculty members, specifically those teaching at the tertiary level, need to focus on the quality and credibility of the research publications. Lastly, existing linkages and networks of the university must be maintained and sustained while creating ones for future research collaborations.

Recommendation

Given that this research was done during the initial implementation of UST-Legazpi's efforts to become a research university, it is recommended that another study on the perspectives on research and research productivity of the UST-Legazpi Faculty be conducted after five to ten years. An in-depth interview and focus group discussion can also be implemented to deepen further the narratives on faculty members' perspectives on research.

It is further recommended that:

1. Submission of progress reports for research undertakings of the faculty for further checking and follow-up by the Office of Research;
2. Re-orientation of the Research Policies and Procedures in each of the departments as an avenue to further assess and evaluate the research culture of individual units of the university; and
3. Continuous research capability efforts from the office to discuss new trends and developments in research

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22nd SEAAIR Conference "Best Paper" Award

A Causal Model of Organizational Culture, Psychological Attributes, School Environment and Performance of Faculty in Higher Education Institutions

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ABSTRACT

The study aimed to develop a causal model that served as the best fit model for the performance of three hundred fifty-three (353) faculty in state universities and colleges in Northern Mindanao, Philippines, during 2017-2018. The study employed a descriptive-correlation, and causal research design using mean, standard deviation, frequency, percentage, Pearson product-moment correlation, multiple stepwise regression, and path analysis as the statistical tools to treat the data gathered. Results revealed that the organizational culture of faculty in higher education institutions in terms of involvement, consistency, adaptability, and mission traits was generally high. The faculty strongly agree regarding their psychological attributes. They are neutral about their present school environment. Also, the performance of the faculty is very satisfactory. It also found that the work attitude of the faculty is significantly correlated with performance. The result further revealed that faculty work attitude is the best predictor of performance. Finally, a performance culture consistency motivation (PCCM) model was developed anchored on the consistency of organizational culture and personal motivation of faculty as supported by adaptability, work attitude, affiliation, student support, and participatory decision-making.

Keywords: Organizational Culture, Psychological Attributes, School Environment, Faculty Performance, Performance Culture Consistency Motivation Model

Editor's Note: Publication deferred pending enhancements

22nd SEAAIR Conference "Outstanding Paper" Citation

Risk Analysis and Mitigation Learning from Home During the COVID-19 Pandemic: An Effort to Transform the Quality of Education

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ABSTRACT

The COVID-19 pandemic in Indonesia has required schools to provide learning services from home for all students since mid-March 2020 until now. Decreased quality of learning is a significant concern. Nevertheless, these limitations have also brought improvements to the quality of education. This research used challenges and difficulties as a foothold for change. The research uses a qualitative method design of a case study to present as much information as possible about the Risk Management of Implementation Learning from Home during the COVID-19 Pandemic at SMA 'X' in North Jakarta. The risk analysis process starts with risk identification through interviews with a few teachers. The likelihood and the impact ratings are derived from the study of internal school documents as the primary data through focus group discussions with homeroom teachers. The risk values were obtained by multiplying the probability and impact factors and then presented in the heatmap matrix. Bow Tie Diagrams demonstrate each event as a whole, including the mitigation procedure applied to each likelihood and impact. The results of the study explain the identified causing factors of the decline in the quality of education, namely teachers' readiness and skills, unchanged learning method, and the difficulties in measuring student competency. An intriguing phenomenon was identified for further study. It can serve as a basis for developing more effective learning methods, as an effort to mitigate risk in this school and other schools with similar backgrounds to improve the quality of education.

Keywords: Learning from Home, Risk, and Mitigation, Education, Transforming

Editor's Note: Publication deferred pending enhancements