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Editorial

Our Preliminary Review continuously screened out 60% of all papers submitted, resulting in 6 articles going forward to the Double-Blind Reviews. The first paper from India looks at research outputs searched from research indices. Meanwhile, the second paper attempts to develop a framework for the institution's analysis, development, and alignment to the program's Vision, Mission, Goals & Values (VMGV), and SMART Objectives of the organization to align strategic and operational planning. The other four papers are more focused on language and skills development and applications of task-based language teaching (TBLT) and acceptance and use of technology in pedagogies; with one on the effectiveness of cognitive restructuring (CR) and study-skill training (SST) on test anxiety and academic achievement and the last one in questionnaire for EFL students' perceptions of a grammatical intonation module designed and applied to enhance their grammatical intonation competency.

The key synopses of these six papers are as follows:

- **Article 1 – Samwel Saimon Lwiza and Vipin Sharma** *from the University School of Business, Chandigarh University, India*, explored research outputs produced on efficiency in education, including that linked efficiency with equity and quality or inclusion to identify gaps for future research. The analysis used documents from the Scopus database published between 1990 and 2021.
- **Article 2 – Mubarak AlKhatnai** *of King Saud University, Riyadh, Saudi Arabia*, and **Teay Shawyun** *of South East Asia Association for Institutional Research* proposes a 5-Levels-Analysis, **Development & Alignment (ADA)** Framework to analyze, develop and align the Vision, Mission, Goals & Values (VMGV), SMART Objectives, and Strategic & Operational Action Plan across the Institution, Colleges & Programs (ICP). Within this generic 5-Levels-ADA framework is the integrated application of (1) Quality Discipline tool of Plan, Do, Check & Act (PDCA), (2) Strategic Management Discipline of the Strategic & Operational Plans guided by the Vision, Mission, Goals & Values (VMGV) and SMART Objectives of the organization, (3) Organization Performance Excellence Discipline of Approach, Deployment, Learning & Integration (ADLI) of MBNQA. The framework aims to overlook potential issues resulting in action plans developed in piecemeal modes by programs unrelated to the program's objectives for Organization Performance Management (OPM), thereby weakening the fullest beneficial actions.
- **Article 3 – Lew Ya Ling** and **Naginder Kaur**, *both of Academy of Language Studies, UiTM Perlis Branch, Malaysia*, and **Wong Hoong Cheong** *of Academy of Language Studies, UiTM Terengganu Branch, Malaysia*, explore the influence and effect of task-based language teaching on learners' communication readiness and anxiety. This study was designed as a task-based language teaching (TBLT) activity, in which 75 non-native Mandarin learners at a Malaysian institution of higher learning stepped out of the classroom to engage in simple communication tasks with native Mandarin speakers.

- **Article 4 – AnniMalar A/P Muthuraman** of Center for Australian Degree Program, INTI International College, Penang, and **Siti Intan Nurdiana Wong Abdullah** of Faculty of Business and Communication, INTI International University, Negeri Sembilan determined the factors influencing their satisfaction with ERT implemented by higher learning institutions in Penang, especially among undergraduate students. The study uses the underpinning unified theory of acceptance and use of technology (UTAUT). The four vital influencing factors identified in this study include the usefulness of online materials, network stability, the usability of e-learning platforms, and peer interactions.
- **Article 5 – Saeid Motevalli** of UCSI University Kuala Lumpur, **Tajularipin Sulaiman** of Universiti Putra Malaysia, Serdang, **Mohd Sahandri Ghani Hamzah** of Kolej Universiti Poly-Tech MARA, Cheras, **Fariba Hossein Abadi** of Universiti Pendidikan Sultan Idris (UPSI), Malaysia, **Mohd Nazri Bin Abdul Rahman** of Faculty of Education, University of Malaya, and **Zhooriyati binti Sehu Mohamad** of UCSI University Kuala Lumpur, all from Malaysia investigated the effectiveness of cognitive restructuring (CR) and study-skill training (SST) on test anxiety and academic achievement among university students. The study design was an experimental design using randomized pre, post, and follow-up tests with the control group. This study underlined their contention that CR and SST psycho-educational intervention significantly affects students' test anxiety and academic achievement and that SST influences students' state and trait anxiety levels. In contrast, CR just influenced students' trait anxiety.
- **Article 6 – Taif Ibrahim AL-Kinany, Samah Ali Mohsen Mofreh, and Rohaya Binti Abdullah**, all from the School of Educational Studies, Universiti Sains Malaysia, Malaysia, assessed the validation of the questionnaire using the experts' validity and the Rasch Model analysis of construct validity and reliability. The questionnaire is to investigate the Omani EFL students' perceptions of a grammatical intonation module designed and applied to enhance their grammatical intonation competency. The study's findings indicated that the questionnaire is valid and reliable for measuring Omani EFL college students' perceptions of a grammatical intonation module.

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

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REVIEW ON EDUCATION EFFICIENCY IN RELATION TO EQUITY, QUALITY, AND INCLUSION: A BIBLIOMETRIC ANALYSIS

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ABSTRACT

The role of education in transforming individuals, communities, and the country qualifies its public provision. However, the need to evaluate the use of allocated educational resources is of great importance due to competing demands for scarce public funds. Therefore the concept of efficiency in education comes in. This study aimed to explore research output produced on efficiency in education, including that linked efficiency with equity, quality, or inclusion to identify gaps for future research. The analysis used documents from the Scopus database published between 1990 and 2021. Results indicate that a total of 347 papers sourced from 247 journals and produced by 827 authors researched efficiency in education during the study period. The paper also documented frequently explored themes, principal contributing authors, documents, diaries, countries, and the most relevant affiliations and sponsors on efficiency in education studies. The gaps and limitations of the paper identified the recommendations for future research.

Keywords: SDGs, VOSviewer, Data Envelopment Analysis

Introduction

Public authorities and international communities pay special attention to the education sector as it plays a significant role in the country's economic growth (Cordero-Ferrera et al., 2008). Empirical evidence has shown a strong relationship between educational quality and countries' economic growth (Hanushek et al., 2015). The relationship indicates that improving education systems is among the measures that could ensure the realization of development in the country. Moreover, education benefits can be confined to an individual or spread to the community through external returns (Johnes et al., 2017). At an individual level, education is essential in determining lifetime returns (Chevalier, 2011; Walker & Zhu, 2011). A good investment in education brings economic and social transformation to an individual, which may sustain over a lifetime and spread to the family and community surrounding the beneficiary.

With this importance, both Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs) include education. The main focus of MDGs (Goal 2) was to achieve universal primary education. The goal aims at increasing access to and completion of primary education (United Nations, n.d.). This goal progressed as, by 2015, the enrollment in primary schools in developing regions reached 91%, up from 83% reported in 2000 (United Nations, n.d.). However, these achievements came with several weaknesses in the education sector. For instance, the reports show that in 2015, about 57 million children of school age were out of school, and this mostly affected children from the poorest households and those from countries affected by conflicts (United Nations, n.d.).

Moreover, the increase in school enrollments put pressure on the number of classrooms, books, teachers and other educational resources, which led to the mismatch between the number of pupils and the available teaching-learning resources, thus jeopardizing education quality. Moreover, previous reports highlighted that around 103 million youth worldwide, regardless of enrollment or out-of-school, lacked basic literacy skills, and more than 60% were women. Poor financing in education had been one of the major factors for poor education as primary education was underfunded by USD 26 billion a year (UNESCO, 2012). The problem faced by public schools is that it mainly depends on the government budget. Abolition of fees in public schools made the shortage of funding even worse and thus contributed to a further decline in quality (Bold et al., 2012).

Regarding this, the SDGs shifted the focus, which aimed at ensuring that quality education is inclusive and equitable and promoting lifelong learning opportunities for everyone- Goal 4 (United Nations, 2015). The main objective highlights the first target of the goal as to ensure that all gender categories complete equitable, accessible, and quality education at primary and secondary levels (United Nations, 2015). The target indicates the international community's commitment to emphasizing access and equitable and quality education. The fact that education can contribute to the transformation of the society and a country justifies its public provisions (Johnes et al., 2017). The public authorities finance most countries' education sectors, mainly primary and secondary education. In other countries, even higher

education is either partially or fully financed by public money. The allocation of public funds to finance education brings the importance of assessing its spending in the education sector. The education sectors should use the allocated educational resources efficiently to achieve the desired impacts. The main motive for applying the efficiency concept in education is the competing demand for public funds with other sectors such as health, defense, and infrastructure.

As far as efficiency in education is concerned, it is essential to differentiate between efficiency and effectiveness. Efficiency is the term that refers to "doing things right", which is distinguished from effectiveness which refers to "doing the right things" (Drucker, 1967). Efficient use of resources (whether student ability, school inputs, or financial) is realized when the observed educational output (test scores or value-added) is produced at a minimum level of resources (Johnes et al., 2017) or the desired mix of output is maximized for a given level of resources (Kosor et al., 2019). Effectiveness ensures an appropriate mix of the available resources to achieve the desired outcomes. There is also a difference between quantity and quality generated through education provision. Measuring quantity (number of enrollments, classes, number of students completed, etc.) is not as difficult as determining the quality of education. The latter is more connected to the level of efficiency in education. Likewise, the analysis of efficiency in education is more complex than in other productive sectors for several reasons, including the difficulty in measuring output and constructing the production function (Cordero-Ferrera et al., 2008).

Due to the increased focus on students' teaching-learning environment, the international community has supported data availability and accessibility to ensure smooth assessment and track the progress of SDGs. These datasets are saved as the source for several studies on efficiency in education. These include multi-country reviews of students such as PISA, TIMSS, PIRLS¹, and regional educational assessment datasets in Latin America, West Africa, and Southern and East Africa (Lee, 2018).

There is no consensus among economists and scientists about which approach is the most appropriate for efficiency evaluation. Two significant categories of efficiency measurements; the parametric approach, i.e., stochastic frontier analysis (SFA), developed by (Aigner et al., 1977), and the nonparametric approach, i.e., Data Envelopment Analysis (DEA) introduced by (Charnes et al., 1978) and Free Disposal Hull (FDH) (Deprins et al., 1984) have been employed in efficiency evaluation. However, the most used approach to assessing efficiency in public and private sectors, such as education, is the nonparametric approach due to the existing link between educational inputs and outputs (Ji & Lee, 2010). Several weaknesses and improvements in these approaches have been pointed out and developed to ensure that all education dimensions are getting proper measures and therefore appropriate and effective policies are designed and implemented, thus achieving the SDGs by 2030.

¹ PISA- Programme for International Student Assessment, TIMSS- Trends in International Mathematics and Science Study, PIRLS- the Progress in International Reading Literacy Study

Differences in education sector financing have brought substantial inequalities in learning, particularly for public and private institutions. Due to higher fees, private schools provide better teaching conditions and facilities that enable students to perform better than their public counterparts. Nevertheless, fees charged by private schools are not affordable to most students from poor backgrounds. It is also essential to question whether this huge fund is allocated to private schools' efficient utilization to generate the desired educational outcomes. Differences in financial resource allocation may be among the reasons for performance gaps between private and public schools. The debate about which institutional form (general vs. private) performs better over the other has now become one of the main topics in the educational context (Cordero et al., 2016; Rouse & Barrow, 2009). Based on the above facts, efficiency in education is essential in determining the ideal level of resources sufficiently to attain the desired output.

Moreover, due to competing demands for public funds, accountability, and the need for quality improvement, it is crucial to assess the efficiency with which these funds are being utilized (Kosor et al., 2019). However, information and knowledge on efficiency concepts in education are required to be able to undertake such evaluations. This study explores the research output that has produced inefficiency in the education field for the past three decades. The rest of the paper proceeds as follows; section 2 describes the materials and methods of the study. Section 3 presents the analysis, while section 4 provides a discussion. Finally, section 5 concludes by presenting the study's limitations and recommendations for future studies.

Materials and Methods

This study explores research output on efficiency in education published over the past thirty years. A comprehensive analysis was based on the online searched documents retrieved from the Scopus database (<https://www.scopus.com>) on 22/07/2021. The following terms were typed on the 'search document' field: *"student* efficienc*" OR "school* efficienc*" OR "universit* efficienc*" OR "college* efficienc*" OR "education* efficienc*" OR "*efficienc* and inclusive education*" OR "*efficienc* and *equit* education*" OR "*efficienc* and qualit* education*"*. In the "search within" field "Article title, Abstract, Keywords" was selected to include all documents containing the words in either title, abstract, or keywords. The search items obtained a total of 605 documents. The result was then refined, i.e., on the year of publication to include only documents published between 1990 and 2021; on the document type field to include only articles and reviews to ensure that only peer-reviewed documents on efficiency in education are included. The documents were also restricted to the ones written in the English language. Other fields such as open access options, author name, and source article remained unfiltered. The number of documents was then reduced to 368 after such inclusions and exclusions.

Finally, all documents were selected, and on the field of information to be exported, all items were selected except for the "other information" item. Only the "include references" sub-item was selected and downloaded in CSV excel format. Data cleaning was performed in excel, including checking and removing duplication of documents. The documents that

missed important information like author name, title, year of publication, source, etc., were searched online using either DOI or the document link. The required data was obtained and filled in the respective items. Duplication removed one paper, with 20 articles removed because their context was out of efficiency in education. Thus, after cleaning, 347 documents remained for further analysis.

Biometric Indicators and Mapping Visualizations

The analysis was performed by two software; the VOSviewer for network analysis and visualization; and R package for bibliometric analysis. The following analyses were performed, and information was fetched from the software; annual production (documents published yearly), annual total citations, most global and local cited documents, authors' impact, source impact (journal productivity), most relevant and productive countries, most relevant affiliations and funding sponsors. The quality of the documents published was measured using the Hirsh index (h-index). The Impact Factor (IF) and Journal Rank of 2020 were presented for the most productive journals.

Table 1: Main Information about Data on Efficiency in Education, 1990-2021

Description	Results
Timespan	1990:2021
Sources (Journals, Books, etc)	247
Publications	347
Average years from publication	8.61
Average citations per publication	11.36
Average citations per year per publication	1.176
References	13092
Publication type	
Articles	339 (97.7%)
Reviews	8 (2.3%)
Publication contents	
Keywords Plus (ID)	988
Author's Keywords (DE)	880
Authors	
Authors	827
Author Appearances	904
Authors of single-authored publications	86
Authors of multi-authored publications	741
Authors collaboration	
Single-authored publications	95
Publications per Author	0.42
Authors per Publication	2.38
Co-Authors per Publications	2.61
Collaboration Index	2.94

Analysis

Main Information of the Study

Table 1 presents the main information of the dataset used in the analysis. A total of 347 publications on efficiency in education, sourced from 247 journals and written by 827 authors, were produced between 1990 and 2021. The dataset comprised 339 (97.7%) articles and 8 (2.3%) reviews. Authors of multi-authored documents dominated, 741 (90%) with a collaboration index of 2.94.

Trend of Literature

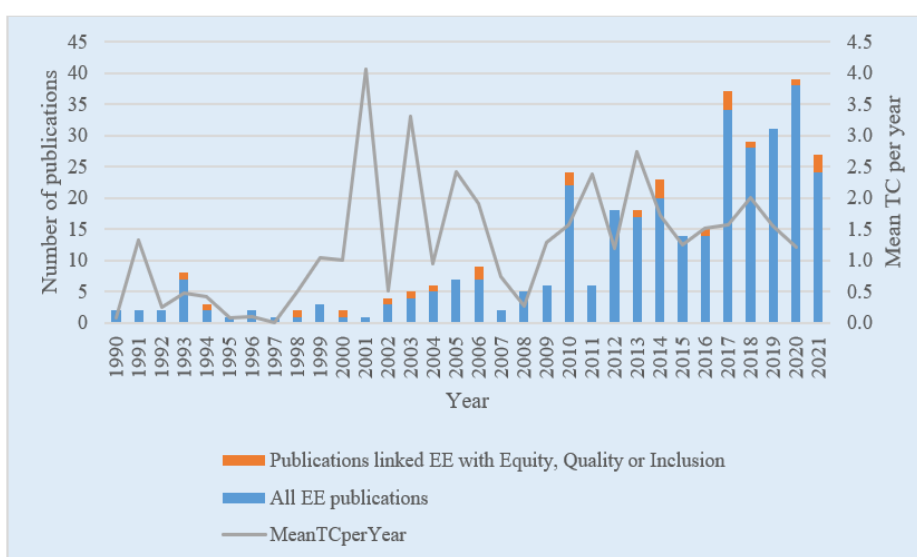


Figure 1: Number of Documents per Year, 1990-2021

Note: EE- Efficiency in Education

Figure 1 presents the annual publications and citation trends of documents published on efficiency in education. The figure shows 347 publications retrieved for 31 years from 1990 to 2021. It also shows the mean total citations of the publications and the number of publications that linked efficiency in education with equity, quality, or inclusion. From 1990 to 2000, the number of documents published ranged from 1 and 3 per year except for 1993, which recorded the highest number of publications (7 papers) during the 1990s. A steady rise in publications is shown from 2002 to 2010, dropped in 2011, and rose further to the highest peak in 2020 (38 documents). The implementation of the MDGs might be among the reasons for growth in papers published from 2002, as more studies were needed in the education sector for formulation and implementation of evidence-based policies, as well as establishing the baseline and tracking the progress of the goal. This also might have been the case for the post-2015 period when the new development goals-SDGs started to be implemented. The highest mean total citation was attained in 2001, which might be due to the same reasons mentioned above.

Publications linked Efficiency in Education with Equity, Quality or Inclusion

The first publication that researched efficiency, access, and quality in the education sector was published in 1993 (Hinchliffe, 1993). The study mainly focused on the status of education and training systems, particularly on efficiency, quality, and access in Caribbean nations. Since then, the number of publications that linked efficiency with equity, quality, or inclusion in education ranged between 0 and 2 per year except for 2014, 2017, and 2021 which both recorded three publications. Specifically, studies linked efficiency in education with equity in the past three decades include; Husted and Kenny (2000), Hanushek and Luque (2003), Cherchye et al. (2010), Woessmann (2010), Lauri & Pöder (2013), Benito et al. (2014), Fethke (2017), Ferraro and Pöder (2018) and Delprato and Antequera (2021). At the same time, Hinchliffe (1993), Riddell (1998), Heyneman (2004), and Nordstrum (2006) linked efficiency in education with either quality or inclusion.

Top 10 Most Productive Journals

Table 2: Journals Contribution of the Countries to the Literature contribution to Efficiency in Education, 1990-2021

S/N	Journal	<u>h index</u>	TC	NP	<u>PY_start</u>	IF (2020)	Journal Rank
1	Economics of Education Review	10	426	10	2003	2.238	Q1
2	Socio-Economic Planning Sciences	5	86	10	2016	4.923	Q1
3	International Journal of Educational Management	5	65	7	2009	1.605	Q2
4	Education Economics	4	172	4	2006	1.162	Q2
5	European Journal of Operational Research	4	182	5	2001	6.02	Q1
6	Journal of the Operational Research Society	4	82	5	2002	2.65	Q2
7	Applied Economics	3	133	4	2005	1.81	Q2
8	International Journal of Educational Development	3	46	7	1993	1.8	Q1
9	Journal of Productivity Analysis	3	100	3	2006	2.76	Q1
10	Higher Education	2	64	3	1996	4.64	Q1

Note: TC- Total citation, NP-number of publications, PY_start- the year started, IF- impact factor

The top 10 most productive journals on efficiency in education are presented in Table 2. The Economics of Education Review was the most influential journal with an h-index of 10, a total citation of 426, 10 publications on efficiency in education, an impact factor of 2.238, and ranked as quartile 1 (Q1). Other productive journals were Socio-economic Planning Sciences and International Journal of Educational Management, each with an h-index of 5, Education Economics, European Journal of Operational Research, and Journal of the Operational Research Society, each with a four h-index. The rest of the top 10 journals had an h-index of 3 except the last in the top ten, which had an h-index of 2. The journal with

the oldest document among the top 10 journals was the International Journal of Educational Development.

Table 3 presents the most productive countries on efficiency in education, based on the countries of the corresponding authors. The United States of America was the most influential country with 14 (13.9%) publications and 262 total citations, of which 12 documents were single-country, and only two documents were multiple-countries publications. Spain was the second country on the list with 11 (10.9%) publications, all single-country documents, and 302 total citations (the most on the list). Italy was the third with 8 (7.9%) publications, followed by the United Kingdom with 7 (6.9%) and Turkey with 6 (5.9%). Other contributing countries include; China, France, Iran, Australia, and Brazil. Single-country publications dominated, with all countries except for the United Kingdom having more (or equal) single-country than multiple-country publications.

Table 3: Top 10 Most Relevant and Productive Countries, 1990-2021

S/N	Country	NP	%	TC	SCP	%	MCP	%
1	USA	14	13.9	262	12	11.9	2	2.5
2	Spain	11	10.9	302	11	10.9	0	0.0
3	Italy	8	7.9	113	7	6.9	1	1.3
4	United Kingdom	7	6.9	140	2	2.0	5	6.3
5	Turkey	6	5.9	6	6	5.9	0	0.0
6	China	5	5.0	2	4	4.0	1	1.3
7	France	4	4.0	38	2	2.0	2	2.5
8	Iran	4	4.0	10	4	4.0	0	0.0
9	Australia	3	3.0	29	3	3.0	0	0.0
10	Brazil	3	3.0	4	3	3.0	0	0.0

Note: NP-number of publications, TC- total citations, SCP-single country publications, MCP- multiple country publications. % represents the percentage of the total number of publications (i.e., 101) by which the countries of the corresponding authors have been recognized

Main Authors to the Field

The main contributors to efficiency in the education field were Agasist T., who had ten publications, 191 total citations, an h-index of 8, followed by De Witte K (6 publications, 212 total citations-the most in the list, and an h-index of 5). Others include Barra C, Essid H., Johnes J., and Zotti R (all had four publications each). The rest of the top 10 most productive authors had three publications each. The interesting results of this analysis are that Italy and Spain were the dominant countries of origin, of which 6 out of 10 most productive authors come from these countries. The rest came from institutions in Belgium, Tunisia, the United Kingdom, and Iran.

Table 4: Main Contributing Authors to the Field, 1990-2021

S/N	Author	Institution	NP	TC	h_index	PY_start
1	Agasisti T	Department of Management, Economics and Industrial Engineering, Politecnico di Milano, Milano, Italy	10	191	8	2006
2	De Witte K	University of Leuven (KUL), Naamsestraat 69, 3000 Leuven, Belgium	6	212	5	2010
3	Barra C	Department of Economics and Statistics, University of Salerno, Salerno, Italy	4	57	3	2016
4	Essid H	Institut Supérieur de Gestion, 41, Rue de la liberté, Cité Bouchoucha 2000, Le Bardo, Tunis, Tunisia	4	50	4	2013
5	Johnes J	Department of Economics, Lancaster University, Lancaster LA1 4YX, United Kingdom	4	76	3	2006
6	Zotti R	Department of Economics and Statistics, University of Salerno, Fisciano, SA, Italy	4	57	3	2016
7	Cordero J.M	University of Extremadura, Departamento de Economía, Av. Elvas s/n, Badajoz, 06071, Spain	3	58	3	2017
8	Santín D	Universidad Complutense de Madrid, Spain	3	86	3	2014
9	Ameri A	School of Management and Medical Information Sciences, Kerman University of Medical Sciences, Kerman, Iran	2	10	2	2020
10	Aparicio J	Center of Operations Research (CIO), University Miguel Hernandez of Elche (UMH), Elche (Alicante), 03202, Spain	2	32	2	2018

Note: NP-number of publications, TC- total citations, PY_start- year started

Most Cited documents

The study also explored the most global and local cited documents' inefficiency in education. Results show that the investigation by Hanushek and Luque (2003), who wrote on "Efficiency and Equity of Schools around the World," received the highest number of global citations (171) but a low number of local citations (2) during the study period. Other documents which received high citations include; Hu (2005), De Witte and Kortelainen (2013), Portela et al. (2001), Jimenez et al. (1991), Berbegal-Mirabent et al. (2013), Katharaki and Katharakis (2010), Grosskopf et al., (1999), McMillan and Chan (2006) and Perelman and Santin (2011) as indicated on table 5.

Table 5: Most Cited Documents on Efficiency in Education, 1990-2021

S/N	Document	Global Citations	Local Citations	Document Type
1	Hanushek and Luque (2003). Efficiency and Equity in Schools around the World. <i>Economics of Education Review</i> , 22(5), pp. 481-502.	171	2	Article
2	Hu, G. (2005). English Language Education in China: Policies, Progress and Problems. <i>Lang Policy</i> 4, 5–24.	150	0	Review
3	De Witte and Kortelainen (2013). What explains the performance of students in a heterogeneous environment? Conditional efficiency estimation with continuous and discrete environmental variables. <i>Applied Economics</i> , pp. 2401-2412.	87	2	Article
4	Portela and Thanassoulis (2001). Decomposing school and school-type efficiency. <i>European Journal of Operational Research</i> , July, 132(2), pp. 357-373.	81	3	Article
5	Jimenez et. al., (1991). The relative efficiency of private and public schools in developing countries. <i>World Bank Res. Obs. Volume 6(2)</i> ; 205 - 218	76	1	Article
6	Berbegal-Mirabent et al., (2013). The pursuit of knowledge transfer activities: An efficiency analysis of Spanish universities. <i>J. Bus. Res.</i> 66(10); 2051-2059	69	5	Article
7	Katharaki and Katharakis (2010). A comparative assessment of Greek universities' efficiency using quantitative analysis. <i>Int. J. Educ. Res.</i> 49 (4-5); 115-128	65	3	Article
8	Grosskopf et al., (1999). Anticipating the Consequences of School Reform: A New Use of DEA. <i>Manage Sci.</i> 45(4); 608-620	65	1	Article
9	McMillan and Chan (2006). University Efficiency: A Comparison and Consolidation of Results from Stochastic and Non-stochastic Methods. <i>Education Economics</i> , 14:1, 1-30	63	5	Article
10	Perelman and Santin (2011). Measuring Educational Efficiency at Student Level with Parametric Stochastic Distance Functions: An Application to Spanish PISA Results. <i>Education Economics</i> , 19:1, 29-49	62	4	Article

Note: Global citations include all citations of the respective publication from the documents in the Scopus database but are not included in the pool of documents (347) used for analysis. Local citations include only citations of the respective publication from the documents downloaded for this analysis.

Word cloud

Figure 2 presents the most occurred authors' keywords on efficiency in education documents. Apart from "efficiency", "education", and "educational efficiency" which mainly appeared due to inclusion in search terms, higher education was another most frequent word, which suggests that more studies on efficiency in education have been conducted at higher education institutions. "School efficiency" was also among the most occurred words indicating that at the school level, the efficiency of the institution (i.e., school) was the most researched as compared to the efficiency of students, staff (teachers), or management. Results also indicate that Data Envelopment Analysis (DEA) –one of the nonparametric (non-stochastic) approaches was the most employed method in efficiency analysis. Malmquist index and boot-strap techniques indicate that some of the studies augmented DEA with these techniques to improve the analysis results. Other studies used Stochastic Frontier

Analysis (SFA), as shown in the figure. Few documents have studied efficiency concerning equity, quality, and inclusion. Different themes which have been frequently explored with education efficiency include; management, academic achievement, e-learning, evaluation, accountability, human capital, teacher education, technology, distance learning, machine learning, and knowledge transfer.

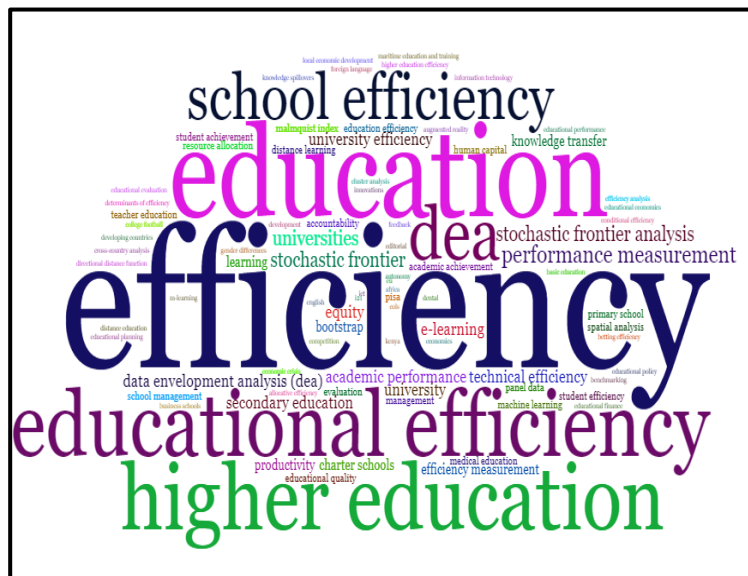


Figure 2: Wordcloud of Authors Keywords, 1990-2021

Most Appeared Themes/Keywords

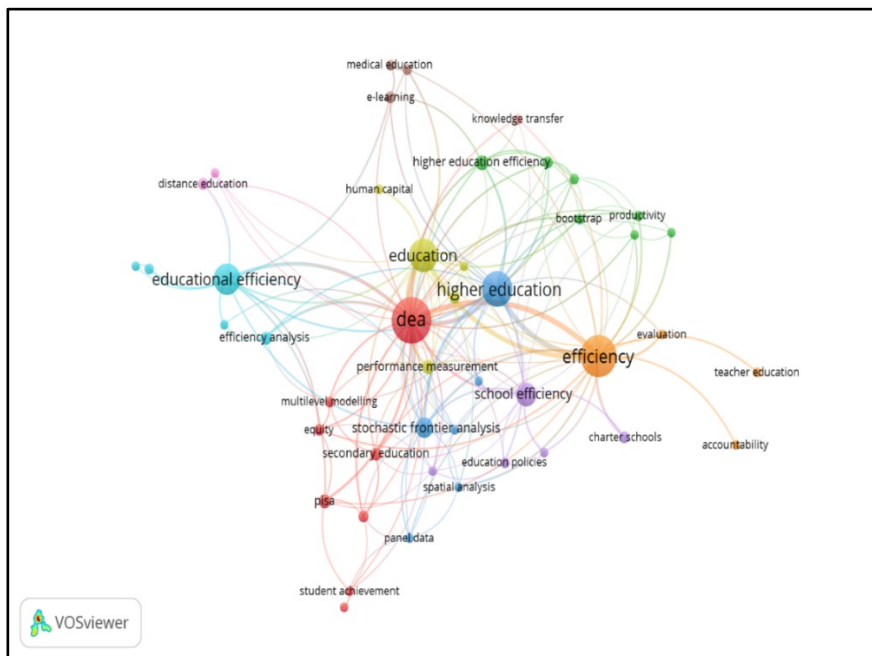


Figure 3: Co-word Network Map, 1990-2021

The paper also intended to explore more common themes, frequently appearing and most researched on efficiency in education from 1990 to 2021. These words typically had been included in a document's title, keywords, or abstract. To assess which words have been

related to efficiency in education or most appeared together, the VOSviewer tool was employed. Co-occurrence and author keywords were selected as type and unit of analysis, respectively, whereas fractional counting was specified as the counting method. The Thesaurus file was uploaded to clean up some typos. The minimum number of occurrences of a keyword was defined as 3, making 46 out of 880 words meet the threshold. Results show that Data Envelopment Analysis- DEA (68), efficiency (57), higher education (40), education (35), educational efficiency (32), and stochastic frontier analysis (14) are the words with the most occurrences on efficiency in the education field. DEA is of great interest, apart from the other four words which have a substantial number of occurrences because of the search codes which involved at least one of these words. The most significant number of occurrences imply that DEA is the most employed analysis technique for efficiency in education. Network analysis also shows that the DEA approach is linked with boot-strap and Malmquist index, which are augmented to improve the DEA approach. Another observation from the co-word network map is that higher education is the level of education where efficiency in education research is mainly conducted. Fewer or no occurrences of educational equity, quality, and inclusion indicate few studies on educational efficiency concerning equity and quality in the education sector. Likewise, few studies have analyzed student efficiency (compared to school efficiency), and no pre-primary education is indicated in Figure 3.

Higher education research was linked to technology, e-learning, knowledge transfer, management, and education policies. Secondary level education research was linked with performance measurement. Equity, though little research was done on this, is connected to efficiency, developing countries, and PISA data. Moreover, the co-word network map indicates that PISA and TIMSS have frequently used in efficiency analysis.

Conceptual Structure

The common conceptual frameworks from the documents researched on efficiency in education are presented in Figure 4. The Factorial Analysis and Corresponding Analysis methods were used. Two clusters were identified to form concepts frequently linked to efficiency in education, one with four and another with 41 words. Results show that cluster 1 focused on concepts such as student achievement, panel data, technical efficiency, and PISA. In contrast, cluster 2 focused on productivity, boot-strap, Malmquist index, school efficiency, learning, educational quality, and equity.

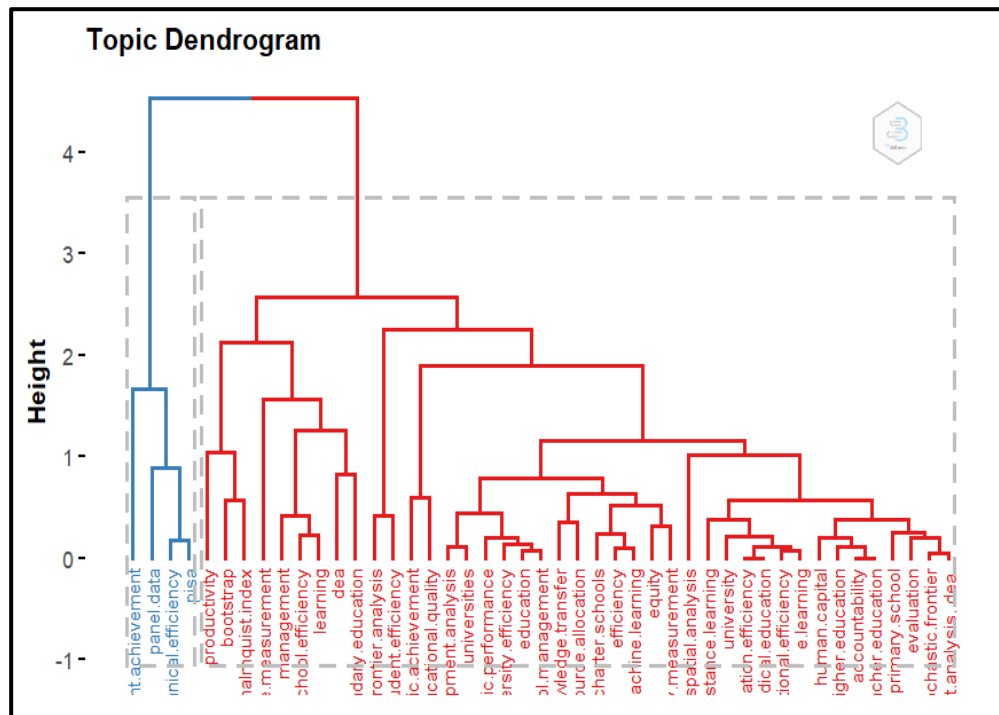


Figure 4: Conceptual Frameworks Associated with Efficiency in Education, 1990-2021

Most Relevant Affiliation

Institutions with the most in publishing documents on efficiency in education are the University of Thrace (Greece) and the University of Paris (France) were the most relevant and productive affiliations with eight publications each, followed by the Tehran University of Medical Sciences (Iran) with seven publications, Universidad de Sevilla (Spain), Politecnico di Milano (Italy) and Dana-Farber Cancer Institute/Brigham and Women's Hospital (USA), both with six documents. Others are the University of Malaga (Spain), University of Jaén (Spain), University of Alcalá (Spain), Universitat Politècnica de Catalunya (Spain), King Abdulaziz University (Saudi Arabia), Kazan Federal University (Russia), and Columbia University (USA) both with five publications. Spain dominated as the home country for the most relevant affiliations (5 institutions), and collaborations from the countries considered as developing, i.e., Iran and Saudi Arabia, also featured in the list.

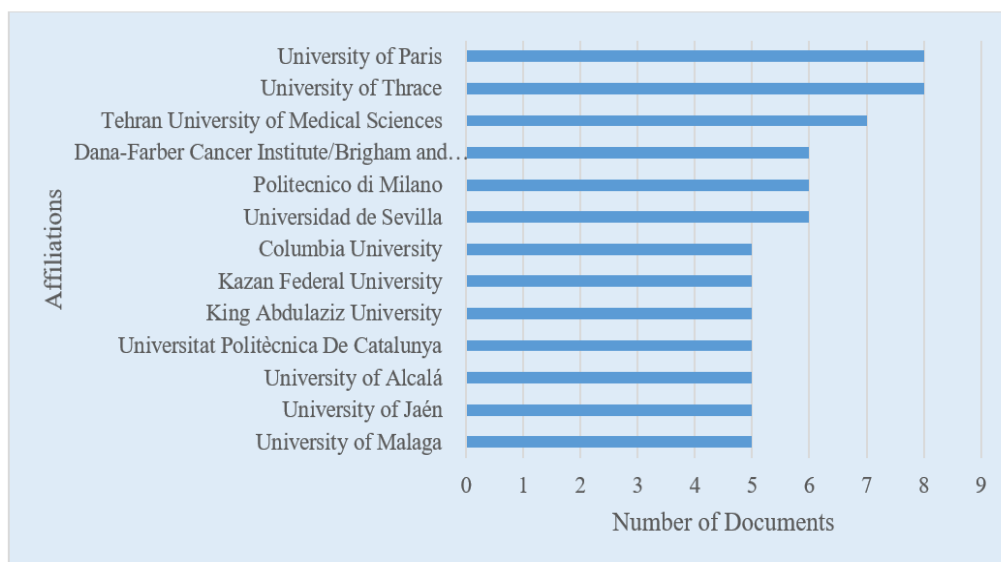


Figure 5: Top 10 Most Productive Affiliations on Efficiency in Education, 1990-2021

Most Funding Sponsor

The most funding agencies in the field of efficiency in education are presented in figure 6. The figure indicates that the National Institute of Health (USA) is the leading institution that sponsored four documents, followed by European Commission (Europe), Junta de Extremadura (Spain), Ministarstvo Prosvete, Nauke i Tehnološkog Razvoja (Serbia) and Ministerio de Economía y Competitividad (Spain), both sponsored three documents. Others are Agencia Estatal de Investigación (Spain), Conselho Nacional de Desenvolvimento Científico e Tecnológico (Brazil), Economic and Social Research Council (UK), European Regional Development Fund (Europe), and KU Leuven (Belgium) with each sponsoring 2 documents each. Results indicate that Spain is home to three institutions out of ten, followed by the European Union.

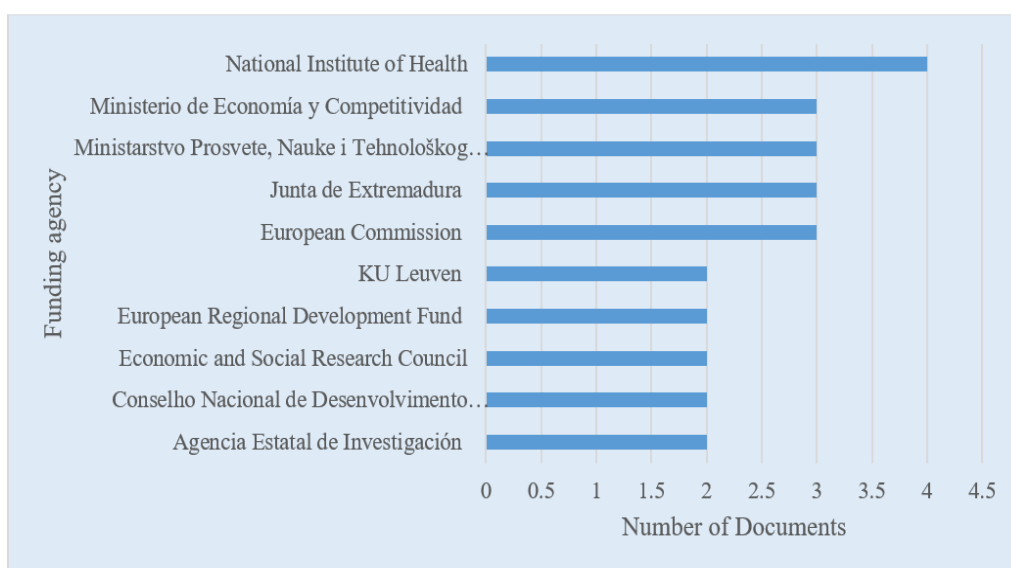


Figure 6: Top 10 Funding Agencies, 1990-2021

Discussion

The main objective of this paper was to explore research output that has been produced on efficiency in education for the past three decades. The study also examined the number of publications written on efficiency in education with either equity, quality, or inclusion to respond to the international community's commitment to the development goals put in place from 2000 to 2015 (MDGs) and from 2016 to 2030 (SDGs). This study used the Scopus database to examine the number and contribution of the documents in the field. Search words like student efficiency, school efficiency, college efficiency, university efficiency, educational efficiency, efficiency, inclusive education, efficiency, equity education, and efficiency and quality education were used to search the documents. After filtering different categories and data cleaning based on the requirement of this study, a total number of 347 publications authored by 827 authors published from 1990 to 2021 were retrieved from the database. Analysis of publications trends, most cited documents, most productive authors, contributing countries, most productive journals, and central themes on efficiency in education was undertaken.

Results from the trend of the literature revealed that between 1990 and 2017 there was a steady increase in publications from 1 to 34 documents per year. However, the rise was an unstable and experienced rise and fall during the period. Although results indicate a recent increasing trend, there is a need for more studies on efficiency in education, thus calling for additional support, especially in funding, to boost production and publication in this field. Journals' contribution was also examined in this study. Results show that *Economics of Education Review* was the most cited journal, followed by *Socio-economic Planning Sciences*, *International Journal of Educational Management*, *Education Economics*, *European Journal of Operational Research*, and *Journal of Productivity Analysis*. From the analysis, it is shown that there were fewer publications related to efficiency in education. Although the number of journals was decently high (247), the number of publications from each journal was relatively small. Thus, the study suggests interventions aim to increase the number of publications.

Concerning countries involved in producing articles related to efficiency in education, the study indicates that the USA had the most significant number of documents during the period under analysis. Corresponding authors from the USA produced about 14% of all publications. Other countries that significantly contributed to this field were Spain, Italy, the United Kingdom, Turkey, China, France, Iran, Australia, and Brazil. Generally, each of these countries' contribution to efficiency in education literature is relatively low compared to other fields of education. Moreover, apart from China, Iran, and Brazil, which have both features of developing and developed countries, publications from this field have been concentrated in the developed world. There is a need to boost research from developing countries, where the public sector mostly dominates education and the majority of schools depend on government funds for their operations which is the main reason for poor education quality. The government, development partners, and other stakeholders need to be informed

on how the resources allocated in the education sector can be efficiently utilized to generate the desired impact on educational attainment in the developing communities.

Regarding the main contributors and most cited documents, the study explored the authors who had produced many articles and received a significant number of citations from their works. Results indicate that there were about 827 authors who either co-authored or single-authored 347 documents from the Scopus database during the study period. Among these, Agasisti was the author with the most significant number of papers on efficiency in education, followed by De Witte, Barra, Assid, and Johnes. Others were Zotti, Cordero, Santin, Ameri and Aparicio. Given that some of these publications were co-authored, there is still a need to increase the number of publications in the field. Therefore, the literature that will provide information to the policymakers and decision-makers in the education sector is rising. Apart from the number of publications, the assessment was done on the number of article citations based on the author. Again, results indicate that De Witte had the most significant citations, followed by Agasisti, Santin, Johnes, and Cordero. Other authors who had substantial contributions were Barra, Zotti, Essid, Aparicio, and Ameri. However, the paper by Hanushek and Luque (2003) received the highest number of citations when it comes to the greatest number of citations based on a published document. Other documents with high citations include; Hu (2005), De Witte and Kortelainen (2013), Portela et al. (2001), and Berbegal-Mirabent et al. (2013). By looking at the titles of the most cited documents, most of these articles based their studies on school efficiency, except for papers by De Witte and Kortelainen (2013) and Perelman and Santin (2011), which mainly focused on the student efficiency. Although, based on these results, we may argue that most of the researchers or stakeholders might be more interested in school efficiency than other levels of efficiency evaluation such as student and education systems, however, the fact that few studies have been conducted in this specific area might have been the cause for fewer or no citations in other levels of efficiency analysis. The study suggests a need to focus on increasing the number of works focused on the efficiency of students, education systems, and non-discretionary factors surrounding schools and homes (De Witte & López-Torres, 2017).

The study also explored themes that mainly researched efficiency in education by counting the number of occurrences or co-occurrence using the VOSviewer software. Results indicated that about 46 words were frequently included in publications. DEA, efficiency, higher education, and stochastic frontier analysis were found to have the most occurrences on efficiency in the education field. An interesting observation in this finding is that DEA was the technique primarily used to determine education efficiency in the period under study. The reason for the most frequent occurrence might be that the method has proven to be the best in analyzing efficiency in the education context. Or the research has not gone further to explore other analysis tools which might be as effective as or more effective than DEA. This study suggests the use of other advanced techniques which have shown to be more effective than DEA, such as Free Disposal Hull (FDH), order- m , and order- α (partial frontier analysis). Moreover, the Network analysis shows that the DEA approach is linked with bootstrap and Malmquist index, mostly regarded as augmented approaches to improve the DEA

method. This indicates that improving the DEA approach by combining it with other techniques is one of the reasons most researchers prefer the approach in efficiency analysis.

Another observation from the co-word network map is that higher education was the level where efficiency in education research was primarily conducted. Higher education research was linked with technology, e-learning, knowledge transfer, management, and education policies. On the other hand, secondary level education research was linked with performance measurement, while research on pre-primary education was not featured in the network analysis. This indicates that little research has been conducted on pre-primary education. The study suggests that the focus should be on this educational level which is very crucial for children's educational foundation. The link between early education and themes like e-learning, Information, Communication, and Technology (ICT) has recently gained popularity due to the outbreak of pandemics that restricted students from attending physical classes. Studies on these topics will provide valuable information for a country- and institutional-level decision-making and planning for educational quality improvement.

Moreover, various studies have revealed that high-fee schools provide better educational quality than low-fee schools (Kumar & Choudhury, 2021; Shabbir et al., 2014). However, high-fee schools exclude students from a low-income family background (Ferraro & Pöder, 2018). Moreover, some studies indicate that low-fee schools have higher efficiency than their counterparts (Johnes & Virmani, 2020). An interesting question here is; is there any tradeoff between efficiency and equity, quality, or inclusion in education? Few studies have examined this problem; for instance, the survey by Husted and Kenny (2000) indicated the existence of an equity-efficiency tradeoff in the education system. The study pointed out that governments strive to reduce inequality in education spending to give more equal education opportunities and thus improve inclusion and equality in performances; however, they reduce school management control which negatively impacts school efficiency. Benito et al. (2014) found that reduction in school segregation positively impacts school educational equality, but the impact on efficiency is not clear. Other efficiency-equity studies include; Woessmann (2010), Cherchye et al. (2010), Lauri and Pöder (2013), Fethke (2017), Ferraro and Pöder (2018), and Delprato & Antequera (2021).

The study by Riddell (1998) discussed the need for planning, management, and efficiency reforms; and quality reforms in the education system. The study pointed out that such reforms were needed to improve the efficiency and quality of education. Most governments have been implementing educational expansion policies to improve equality and inclusion, with little attention paid to the quality of education systems. Besides, we cannot wholly assume that educational efficiency is strongly linked with academic quality. There is an argument that although high-income nations heavily invest in educational quality, in many instances, middle-income countries' education systems have a higher efficiency rate than high-income countries (Heyneman, 2004). Moreover, policymakers need to be more cautious when using education services to reduce inequality among the communities. As pointed out by Nordstrum (2006) that though education might be a tool, it is neither the only nor the sharpest tool for reducing inequality in society.

Based on this paper's observations, though there are several studies on the efficiency-equity relationship, limited studies exist on the efficiency-quality and efficiency-inclusion relationship. Moreover, most of them were published more than a decade ago. More evidence-based empirical studies are needed, particularly on efficiency-quality and efficiency-inclusion tradeoffs, especially in developing countries. Given that, governments and development partners have recently shifted their focus to educational quality improvement; and inclusion of marginalized groups such as children with disabilities in the education system. These studies will be helpful in the formulation of evidence-based policies with proper balancing of these aspects. Moreover, research output will be beneficial for appropriate planning and management of educational financing, students' enrollment, school facilities, and staffing at the institutional level.

Furthermore, the co-word network analysis revealed that data from PISA and TIMSS had been used frequently in efficiency analysis. The data fetched from these surveys are comprehensive and cover many countries, giving a wide range of analysis dimensions. However, the research could also use other surveys of the same quality and examine efficiency in education like PISA and TIMSS and compare the mode of analysis and results. Datasets such as PIRLS and Young lives Survey (YLS) conducted in developing countries are an example of surveys that can serve the same purpose as PISA and TIMSS, thus increasing the number of publications as well as the coverage to include developing countries.

Lastly, the study explored institutions involved in publishing and sponsoring research on efficiency in education. Concerning the relevant institutions involved in publishing documents on efficiency in education, the University of Thrace (Greece) and University of Paris (France) were the most relevant and productive affiliations, followed by Tehran University of Medical Sciences (Iran), Universidad de Sevilla (Spain) and Politecnico di Milano (Italy). Others were the University of Alcalá (Spain), Universitat Politècnica de Catalunya (Spain), King Abdulaziz University (Saudi Arabia), Kazan Federal University (Russia), and Columbia University (USA). The most funding agencies for efficiency in education research were; the National Institute of Health (USA), European Commission (Europe), Government of Extremadura (Spain), Ministry of Education, Science and Technological Development (Serbia), and Ministry of Economy and Competitiveness (Spain). Results indicate that Spain had many productive institutions in publication and sponsors compared to other countries. An exciting part was that some of the developing countries were homes for institutions featured in the top ten list, i.e., Iran, Saudi Arabia, and Brazil. This is a good indication of the commitment to increasing publications and funding in developing countries.

Conclusion

The objective of this paper was to explore research output produced on efficiency in education to identify gaps for future studies. The study examined the number of research outputs that produced inefficiency in education between 1990 and 2021 in the Scopus database. A total of 347 documents produced by 827 authors were found and retrieved from

the database for analysis. The assessment was based on the trend of publications, most productive journals, countries, authors, and most cited documents. The authors understand that it is essential to consider this study's limitations. The paper was limited to articles retrieved from the Scopus database, and other studies may use other databases such as Web of Science, PubMed, and Google scholar.

Moreover, the study excluded other types of the documents such as conference papers, book chapters, short surveys, and letters. The study was limited to efficiency in education, although there is a wide range of topics in education apart from efficiency, which may equally affect the education sector. However, the study provides an overview of what has been done in this area and draws several recommendations for future studies.

Firstly, the paper revealed that most of the studies have been focusing on the developed world and recommends that there is a need to increase the number of publications in this area, particularly in developing countries. The education sector in most developing countries depends on government financing and is described as poor quality, inequity, and low inclusion. More research on efficiency is needed to inform the government and development partners on how the allocated resources can best be utilized in this vital sector. Secondly, more research on efficiency in education should focus on student efficiency, environmental efficiency, and educational system efficiency. Thirdly, the study recommends using other analysis techniques apart from DEA and compares the results with previous studies done mainly by this technique. Fourthly, increase studies on efficiency in pre-primary and primary schools and link lower-level education with policy, innovations, inequalities, and access to physical and online learning resources. Fifthly, increase the use of other education surveys apart from PISA and TIMSS, which mainly focus on developing countries where little research has been undertaken. Sixthly, a few studies have included more than one country; more cross-country research on efficiency in education is needed to compare the educational systems of different countries. Lastly, several documents have examined the efficiency-equity tradeoff, especially in developed countries. However, few publications exist on the relationship between efficiency and quality; and efficiency and inclusion. More research is needed in this area, particularly in developing countries. This will increase evidence-based research and enable international partners to formulate and implement policies that will bring balance between these educational dimensions.

References

- Aigner, D. J., Lovell, C., & Schmidt, P. (1977). Formulation and estimation of stochastic frontier production function models. *Journal of Econometrics*, 6, 21–37.
- Alimi, O. S., Ehinola, G. B., & Alabi, F. O. (2012). School Types, Facilities and Academic Performance of Students in Senior Secondary Schools in Ondo State, Nigeria. *International Education Studies*, 5(3).
- Aria, M., & Cuccurullo, C. (2017). Bibliometrix: An R-tool for comprehensive science mapping analysis. *J Informetr*, 11(4), 959-75. Retrieved from <https://doi.org/10.1016/j.joi.2017.08.007>
- Berbegal-Mirabent, J., Lafuente, E., & Solé, F. (2013). The pursuit of knowledge transfer activities: An efficiency analysis of Spanish universities. *J. Bus. Res*, 66(10), 2051-2059.
- Bold, T., Kimenyi, M., Mwabu, G., & Sandefur, J. (2011). The High Return to Private Schooling in Low-Income country. Working Paper.
- Charnes, A., Cooper, W., & Rhodes, E. (1978). Measuring the efficiency of Decision Making Units. *European Journal of Operational Research*, 2, 429–444.
- Chevalier, A. (2011). Subject choice and earnings of UK graduates. *Economics of Education Review*, 30(6).
- Colclough, C., Kingdon, G., & Patrinos, H. (2010). The changing pattern of wage returns to education and its implications. *Development Policy Review*, 28(6).
- Cordero, J. M., Prior, D., & Simancas, R. (2016, September 1). A Comparison of Public and Private Schools in Spain using Robust Nonparametric Frontier Methods. *Central European Journal of Operations Research*, 24(3), 659-680. doi:10.1007/s10100-014-0376-1
- Cordero-Ferrera, J. M., Pedraja-Chaparro, F., & Salinas-Jimenez, J. (2008). *Applied Economics*, 40(10), 1323–1339.
- Cordero-Ferrera, M., Prior, D., & Rodríguez, R. (2014). A comparison of public and private schools in Spain using robust nonparametric frontier methods.
- De Witte, K., & Kortelainen, M. (2013). What explains the performance of students in a heterogeneous environment? Conditional efficiency estimation with continuous and discrete environmental variables. *Applied Economics*, 2401-2412. doi:10.1080/00036846.2012.665602
- De Witte, K., & López-Torres, L. (2017). Efficiency in Education: A review of literature and a way forward. *Journal of the Operational Research Society*, 68(4), 339-363. doi:10.1057/jors.2015.92
- Delprato, M., & Antequera, G. (2021). Public and private school efficiency and equity in Latin America: New evidence based on PISA for development. *International Journal of Educational Development*, 84. doi:10.1016/j.ijedudev.2021.102404

- Deprins, D., Simar, L., & Tulkens, H. (1984). Measuring Labor-efficiency in Post Office. In M. Marchand, P. Pestieau, & H. Tulkens (Eds.), *The Performance of Public Enterprises: Concepts and Measurement* (pp. 243–267). Amsterdam: North-Holland.
- Drucker, P. (1967). *The Effective Executive*. London: Heinemann.
- Ferraro, S., & Pöder, K. (2018). School-level policies and the efficiency and equity tradeoff in education. *Journal of Policy Modeling*, 40(5), 1022-1037. doi:10.1016/j.jpolmod.2017.11.001
- Grosskopf, S., Hayes, K. J., Taylor, L. L., & Weber, W. L. (1999). Anticipating the Consequences of School Reform: A New Use of DEA. *Manage Sci.*, 45(4), 608-620.
- Hanushek, E. A., & Luque, J. A. (2003). Efficiency and Equity in Schools around the World. *Economics of Education Review*, 22(5), 481-502.
- Hanushek, E., & Woessmann, L. (2008). The Role of Cognitive Skills in Economic Development. *Journal of Economic Literature*, 46(3), 607–668.
- Hanushek, E., & Woessmann, L. (2012). The economic benefit of educational reform in the European Union. *CESifo Economic Studies*, 58(1), 73–109.
- Hanushek, E., Ruhose, J., & Woessmann, L. (2015). Economic gains for US states from educational reform. *CESifo Working Papers 5662 Center for Economic Studies and Ifo Institute*.
- Hinchliffe, K. (1993). Caribbean region: access, quality, and efficiency in education. Retrieved from <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85040955036&partnerID=40&md5=e93cc3435a39b37b95076a9794cd2a8a>
- Hirsch, J. E. (2005). An index to quantify an individual's scientific research output. *Proc Natl Acad Sci USA*, 102(46), 16569-72. Retrieved from <https://doi.org/10.1073/pnas.0507655102>
- Hu, G. (2005). English Language Education in China: Policies, Progress, and Problems. *Lang Policy*, 4, 5–24.
- Husted, T. A., & Kenny, L. W. (2000). Evidence on the impact of the state government on primary and secondary education and the equity-efficiency tradeoff. *Journal of Law and Economics*, 43(1), 285-308. doi:10.1086/467456
- Ji, Y., & Lee, C. (2010). Data envelopment analysis. *Stata Journal*, 10(2), 267–280. Retrieved from <http://www.stata-journal.com/article.html?article=st0193>.
- Jimenez, E., Lockheed, M., & Paqueo, V. (1991). The Relative Efficiency of Private and Public Schools in Developing Countries. *World Bank Research Observer*, 6(2), 205–218.
- Johnes, G., & Virmani, S. (2020). The efficiency of private and public schools in urban and rural areas: moving beyond the development goals. *International Transactions Inoperational Research*, 27, 1869–1885.
- Johnes, J., Portela, M., & Thanassoulis, E. (2017). Efficiency in education. *Journal of Operation Research*, 331–338.

- Katharaki, M., & Katharakis, G. (2010). A comparative assessment of Greek universities' efficiency using quantitative analysis. *Int. J. Educ. Res*, 49(4-5), 115-128.
- Kosor, M., Perovic, L., & Golem, S. (2019). Efficiency of public spending on higher education: A data envelopment analysis For Eu-28. *Problems of Education in the 21st Century*, 77(2), 396 - 409.
- Kumar, D., & Choudhury, P. K. (2021). Do private schools produce more learning than public schools in India? Accounting for students' school absenteeism and the time spent on homework. *International Journal of Educational Development*, 83.
- Lauri, T., & Pöder, K. (2013). School choice policy: Seeking to balance educational efficiency and equity. A comparative analysis of 20 European countries. *European Educational Research Journal*, 12(4), 534-552. doi:10.2304/eerj.2013.12.4.534
- Lee, S. S. (2018). The Gini Coefficient's Magic Does Not Work on Standardized Test Scores. *GSE Graduate Student Research*, 6. Retrieved from https://repository.upenn.edu/gse_grad_pubs/6
- McMillan, M. L., & Chan, W. H. (2006). University Efficiency: A Comparison and Consolidation of Results from Stochastic and Non-stochastic Methods. *Education Economics*, 14(1), 1-30.
- Perelman, S., & Santin, D. (2011). Measuring educational efficiency at student level with parametric stochastic distance functions: An application to Spanish PISA results. *Education Economics*, 19(1), 29-49.
- Portela, S., Conceicao, M. A., & Thanassoulis, E. (2001, July). Decomposing school and school-type efficiency. *European Journal of Operational Research*, 132(2), 357-373.
- Psacharopoulos, G., & Patrinos, H. (2004). Human capital and rates of return. In: Johnes G and Johnes J (eds). *International Handbook on the Economics of Education*, 1-57.
- Rouse, C., & Barrow, L. (2009, September). School Vouchers and Student Achievement: Recent Evidence, Remaining Questions. *Annual Reviews of Economics*. 17-42.
- Shabbir, M., Wei, S., Guang Fu, Y., Chong, R. M., Altaf, M., Nabi, G., & Ahmed, B. (2014). A Comparative Study of Public Versus Private Primary Schools, An Evidence From Azad Kashmir (Pakistan Occupied Kashmir). *Journal of Education and Practice*.
- Tauchmann, H. (2012). Partial frontier efficiency analysis. *Stata Journal*, 12(3), 461- 478. Retrieved from <http://www.stata-journal.com/article.html?article=st0270>
- UNESCO. (2012). *The Education for All Global Monitoring Report. Teaching and Learning: Achieving Quality for All*.
- United Nations. (2015). *Transforming our world: The 2030 agenda for sustainable development [General Assembly resolution]*. Retrieved from United Nations: http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E
- United Nations. (n.d.). *Millennium Development Goals and beyond 2015: Goal 2*. Retrieved from <http://www.un.org/millenniumgoals/education.shtml>

Van Eck, N. J., & Waltman, L. (2010). Software survey: Vosviewer, a computer program for bibliometric mapping. *Scientometrics*, *84*, 523-538. Retrieved from <https://doi.org/10.1007/s11192-009-0146-3>

Walker, I., & Zhu, Y. (2011). Differences by degree: Evidence of the net financial rates of return to undergraduate study for England and Wales. *Economics of Education Review*, *30*(6), 1177-1186.

INSTITUTIONAL, COLLEGIAL & PROGRAMMATIC STRATEGIC & OPERATIONAL ACTION PLANS ANALYSIS, DEVELOPMENT & ALIGNMENT

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ABSTRACT

Most HEIs across different continents have aspirations of successful accreditations by national or international agencies to lend credence and credibility to their educational products & services offerings. These aspirations underscore the assessors' performance evaluations per the accreditation standards, criteria & protocols, culminating in accreditation reports of commendations, suggestions, or recommendations. Often overlooked potential issues are resulting action plans developed in piecemeal modes by programs unrelated to the program's objectives for Organization Performance Management (OPM), thereby weakening the fullest beneficial actions. At a higher level, these piecemeal actions might not be aligned with the college's strategic & operational objectives, thereby affecting a coherent and consistent strategic direction of all programs within the college. At the institutional level, this is compounded by the programmatic to collegial to institutional levels non-alignment, thereby affecting the overall institution's strategic direction and holistic performance management. In addressing inherent issues of strategic & operational alignment of an institution with multidisciplinary collegial & programmatic OPM, this paper proposes a 5-Levels-Analysis, Development & Alignment (ADA.) Framework to analyze, develop and align the Vision, Mission, Goals & Values (VMGV), SMART Objectives, and Strategic & Operational Action Plan across the Institution, Colleges & Programs (ICP). Within this generic 5-Levels-ADA framework is the integrated application of (1) Quality Discipline tool of Plan, Do, Check & Act (PDCA), (2) Strategic Management Discipline of the Strategic & Operational Plans guided by the Vision, Mission, Goals & Values (VMGV) and SMART Objectives of the organization, (3) Organization Performance Excellence Discipline of Approach, Deployment, Learning & Integration (ADLI) of MBNQA. This is supplemented by the fundamental 5 Ws & 1 H (What, Why, Who, Where, When & How) rationalizing model for the VMGV & SMART Objectives Positioning Framework analysis, development, and alignment of strategic & operational action plans across multidisciplinary programs & colleges. It is expected that this 5-Levels-ADA Framework can better benefit the ICP towards a more aligned strategic direction, better resources management & allocations, minimizing duplications of systems & mechanisms if the generic institution systems are developed to be perused by the ICP, allowing the programs to focus on the main roles of their teaching, learning & research.

Keywords: Analysis, Development & Alignment (ADA.) Framework, Institution, Colleges & Programs alignment, strategic & operation plan alignment

Introduction

Institutions, Colleges & Programs (ICP) are organizations that behave like organizations that understand the importance of goals & SMART objectives, but setting goals with SMART Objectives is not enough. It's imperative to align people (faculty & staff) goals to the team (programs & colleges) goals and tie these team goals to organizational goals. Everyone from the top to lowest levels of organizational units should be working to achieve the organization's overall strategy by aligning goals & SMART Objectives to get everyone on the same page and moving in the same strategic direction. Aligned goals create a familial, organizational culture based on the organization's values to drive everyone to work together and understand their role & responsibilities and potentially accountabilities of their contributions and commitment to the overall organizational achievements. This is supported by Dewar et al. (2022). They interviewed 67 high-performing CEOs and identified three critical organization-alignment tasks—culture, organization design, and talent management as they are twice as likely to execute their breakaway strategies successfully than are based on 20 years' data of 7,800 CEOs from 3,500 public companies across 24 industries in 70 countries.

Organizational alignment via the cascading of the Organizational goals & SMART Objectives across the strategic and operational levels is a critical differentiator between high-performing and low-performing organizations. Ryba (2021) noted some key benefits of goal alignments throughout the organization (1) Goals set the tone of the organizational strategy by communicating priorities of importance to enable people to plan and execute their work based on those benchmarks. The Organizational goals & SMART Objectives take the organization's overall strategy and break it down into manageable chunks, providing checkpoints along the way to reach the overall strategic mark; (2) People get a sense of commitment to how their contributions are building toward team and organizational goals and see the impact of their action thereby giving everyone an empowered role to play thus promoting accountability while providing natural points for recognition and celebration of good work; (3) Priorities are clarified whereby people understand how their tasks affect the team and organizational goals, thus facilitating the choice of prioritization of job that needs their attention first, and (4) Aligned goals connect people and teams and help everyone get on the same page whereby everyone understands how their work contributes to the organization's main goals, thereby creating bonding whereby everyone works together towards common goals.

The importance of strategic alignment, though widely researched (Baets, 1996; Henderson and Venkatraman, 1993; MacDonald, 1991; Parker et al., 1988; Powell, 1993), mainly involves dual contrasts of higher-level organization strategy with an internal functional strategy, such as procurement strategy (Knudsen, 2003), human resource management strategy (Shih and Chiang, 2005), advertising strategy (Boudreau and Watson, 2006) or IT strategy (Baets, 1996; Henderson and Venkatraman, 1993; MacDonald, 1991; Parker et al., 1988; Powell, 1993; Sledgianowski and Luftman, 2005). These studies include aligning organizational strategies with the external environment (Anderson and Zeithaml, 1984; Bourgeois, 1980; Daft et al., 1988; Hambrick, 1981; Jennings and Lumpkin, 1992). Research in strategic alignment has utilized qualitative and quantitative methods in different industries, such as banking (Baets, 1996; Broadbent and Weill, 1993), bicycle manufacturing (Ho, 1996), and specialty chemicals (Sledgianowski and Luftman, 2005). Related to the notion of alignment is the analysis of the extent of *fit* between an organization's resources and its strategies (Miles and Snow, 1978; Venkatraman, 1989). These are primarily in

business enterprises rather than in HEIs with multifarious colleges & programs in highly diverse disciplines, in addition to similar human resources, IT, financial & services support that highly resembles that of a business organization.

To address inherent issues of strategic & operational alignment of an institution with multidisciplinary collegial & programmatic OPM, this paper proposes a 5-Levels-**Analysis, Development & Alignment (5-Levels-ADA)** Framework to analyze, develop and align the Vision, Mission, Goals & Values (VMGV), SMART Objectives, and Strategic & Operational Action Plan across the Institution, Colleges & Programs (ICP). Within this generic 5-Levels-**ADA** framework is the integrated application of (1) Quality Discipline tool of Plan, Do, Check & Act (PDCA), (2) Strategic Management Discipline of the Strategic & Operational Plans guided by the Vision, Mission, Goals & Values (VMGV) and SMART Objectives of the organization, (3) Organization Performance Excellence Discipline of Approach, Deployment, Learning & Integration (ADLI) of MBNQA. This is supplemented by the fundamental 5 Ws & 1 H (What, Why, Who, Where, When & How) rationalizing model for the VMGV & SMART Objectives Positioning Framework analysis, development, and alignment of strategic & operational action plans across multidisciplinary programs & colleges. It is expected that this 5-Levels-**ADA** Framework can better benefit the ICP towards a more aligned strategic direction, better resources management & allocations, minimizing duplications of systems & mechanisms if the generic institution systems are developed to be perused by the ICP, allowing the colleges & programs to focus on the primary roles of their teaching, learning & research.

The application of the 5-Levels-**ADA** framework is based on a leading public university with 21 colleges and 190 programs across three main disciplines of Health Science, Science, and Humanities. The case data of commendations, suggestions, and recommendations are from the accreditation reports (2018 to 2020) of 10 case studies in the Health Science & Science groups. Six key themes have been identified from the accreditation criteria leading to comments. The 5-Levels-**ADA** framework is used to provide a step-by-step alignment framework from the programs to collegial to institutional strategic & operation planning through the SMART Objectives that mainly are guided and aligned through the strategic Vision, Mission, Goals & Values (VMGV) that provides a strategic aligned direction across all units, all within the six key themes. The six key themes allow for a more holistic big picture instead of a “piecemeal” approach by the programs to address the minor issues. The crux is to address the small issues through the more holistic generic organization systems analysis as perused by the units that allow for the alignment of consistencies and coherences across departments.

Strategic Alignment Frameworks

LSA Global’s (2021) research of 410 companies across eight industries, using their 3x Organizational Alignment Research Model, showed that highly aligned companies grow revenue 58% faster and are 72% more profitable while significantly outperforming their unaligned peers in terms of (a) **Retaining customers** 2.23-to-1; (b) **Satisfying customers** 3.2-to-1; (c) **Effectively leading** 8.71-to-1; and (d) **Engaging employees** 16.8-to-1. Based on their Organizational Alignment Research model and framework using 26 independent variables in the areas of business strategy, organizational culture, and talent that are measured against 15 dependent variables of organizational performance in terms of financial and non-financial performance, seven factors are critical to creating strategic clarity (31%), a high-performing culture (40%), and differentiating your talent (29%) are identified. The alignment between business process management and organizational strategy is crucial and

helps to achieve their organization objectives (Kettinger & Teng, 1998). LSA Global (2021) defines strategy as the “what,” culture as the “how,” and talent as the “who.” The “why” permeates across strategy, culture, and skill. When the organization’s “what,” “how,” and “who” are aligned and supported by a clear and compelling “why,” the institutional, collegial, and programmatic missions, goals, objectives, and strategic & action plans can be accomplished. Armistead et al. (1999) and Trkman (2010) indicated people, management, leadership, information technology, communication, governance, and culture as essential factors associated with the alignment of business process management and organization strategy. The alignment improves monitoring and transparency of the key strategies based on the processes to create and deliver on values that increase profits and help increase people's efficiencies and effectiveness. In addition, Wang (2004) introduced a framework for strategic consistency to ensure that sub-organizational units' strategies governing interactions do not deviate from the broader organizational strategy.

One of the alignment models includes the 7 S model of Waterman et al., which considers seven critical elements of organizations as composed of three ‘hard’ (strategy, structure, and systems) and four ‘soft’ (shared values, skills, staff, and style), all of which are interrelated and interacts closely as a holistic system working in tandem towards a set of established goals. The model is often visualized as a web, with shared values in the center (Waterman et al., 1980; Bradach, 1996). A robust total quality management culture, the critical essence of the organization’s value system constituting the organization’s culture web, is a prerequisite before aligning process management with strategy.

Another fundamental alignment model is the Strategic Alignment Model (Henderson & Venkatraman, 1990; Henderson & Thomas, 1992), highlighting the critical linkages across four domains of Business Strategy, IT Strategy, Organizational and IT Infrastructure & Processes that can significantly affect the competitiveness and efficiency of the business (Papp, 2001; Luftman et al., 1993). Due to the interaction between the strategy process, an essential alignment tool is the Balanced Scorecards at Corporate, Business Units & Staff levels to create a more aligned organization. A key contributor to organizational success is aligning the strategic vision to human capital’s productivity, efficiencies & effectiveness (Labovitz & Rosanky, 1997). This alignment that shows the strategic directions encourages and stimulates employees’ creativity to perform more effectively and effectively in realizing the organizational goals and objectives (Cato & Gordon, 2009).

Components of Strategic Alignment

While these are requisites for a successful organization, there are alignment issues, as noted by Varcoe and Trevor, who identified four primary factors contributing to Organizational Complexity. These arise from the variety of business lines (as in a university whereby there are different collegial & programmatic disciplines), the multifarious number of employees (diverse faculty & support staff in other fields of specialization), variety and expectations from very various customer groups and geographical dispersal (Varcoe and Trevor, 2017). Beer et al. (2005) identified some barriers as the “Silent Killers” of strategy implementation as an unclear strategy with conflicting priorities, lacking effectiveness in the top management team & leadership skills with inappropriate leadership style, and poor collaboration, coordination & communication between the different business divisions, functions and/or geographic regions. Tushman and O’Reilly (2002) identified the organization’s inability to adapt to a changing environment as “structural inertia, that in turn feeds into cultural inertia.” **Structural inertia** is the “resistance to change rooted in the size, complexity, and interdependence in the organization’s structures, systems, and formal processes.” **Cultural inertia**

encompasses the institutionalized learning and shared expectations that “are manifested in the informal norms, values, social networks” and other aspects of culture over time.



Source: Adapted from Trevor, J. & P., (2017) How Aligned Is Your Organization? Harvard Business Review, February 2017)

Figure 1: Interdependent Components of Strategic Aligned Organization

To attain and sustain organizational successes, an organization should link its strategy to its governance and operational processes (Kaplan and Norton, 2008), which require alignment and execution of both strategic & operational initiatives and process improvement programs through its strategic fit in organization design (Nadler and Tushman, 1992 Key components of ADA alignment (Fig.1) from the institution to collegial to programmatic levels start with:

1. **The first component ADA alignment step** of effective alignment of governance, disclosure, and communication of the organization’s purpose enshrined in the VMGV, reducing the risk that stakeholders face when entrusting their trust to organization leaders. Kaplan and Norton (2006), Lawler (1993), and Epstein & Roy (2002) all highlighted the need for a BSC-based governance system that provides the institution leaders & governance with streamlined and strategic information about the institution’s performance based on its PMS to all units within the institution.
2. **The second component alignment step** includes the organization’s SMART Objectives and strategy development & execution that defines how it intends to create value (Rappaport, 1997; Stewart, 1991) for its shareholders, customers, and stakeholders, guiding its core value creation processes through mobilization and alignment of organization intangible assets, namely the human, infor, and organization capitals (Teay, 2022). The SMART Objectives define the key performance metrics of the Strategic accomplishments. Strategy execution at all organization levels is a series of actions that put the plan to the test, guided by the ADA alignment of the SMART Objectives from institution to program levels.

3. **The third component ADA alignment step** for successful strategy execution lies in the organization & units' capacities and capabilities, which are the competencies or new competencies needed for the strategic implementation. These addresses orchestrate teams, resources, and structures, albeit their flexibility or willingness to capture opportunities and achieve high performance, all coupled with unforeseen challenges. Standardizing strategy execution process is particular to each organization's situation, capabilities, and environment, complicating alignment (Harreld, 2014; Martin, 2010). As such, each organization needs to define the competencies of its organization, infor, and human capital adequacy, availability, and accessibility essential to strategic implementation, accomplishment, and achievements.
4. **The fourth component ADA alignment step** critical requirement is to define the adequacy, availability, and accessibility of organizational resources utilized by the human capital for strategy execution. These organizational resources are the foundation of the fifth component of the generic management systems to enable the full functioning of all units availing the generic systems that are developed centrally by the central units and perused by the colleges and programs, thus saving scarce resources, time, and efforts based on this centralized expertise. The critical requirement is the "alignment and congruence" between strategy development and execution amongst the organizational elements or building blocks of essential tasks, organization metrics, rewards, & organizational structure, skills and competencies, organization culture and values, and resources and management systems by which strategy execution is carried out through identifying and closing the performance and opportunity gaps (Harreld et al., 2007; Sull, 2007; Neilson et al., 2008).
5. **The fifth component alignment step** is the organization systems and mechanisms that create and delivers on value (in this case, educational values) to its customers (students) & stakeholders (faculty & staff as internal stakeholders with parents, employers, governmental agencies, and communities & society as external stakeholders). This calls for a tightly managed institution value chain that connects the organization's *purpose* (what we do and why we do it, basically the mission & goals) to its *business strategy* (what we are trying to win at to fulfill our purpose based on the mission & goals), *organizational capacity & capability* (what we need to be good at or excel in so that the organization win), *resource architecture* (what makes us suitable, viz., the systems, mechanisms, and tools underscoring the key processes), and, finally, the fifth step of the *management systems* (what delivers the winning performance we need, i.e., the leadership, governance, administrative systems, values system, and the quality assurance or performance management systems with their basic policies, protocols & practices – "the way we do it here"). The organization's value chain is only as strong as its weakest link. The bottom line is that a winning organization has strong and sound processes, systems, and mechanisms aligned with the vision, mission, goals & strategic objectives (Khadem & Khaddar, 2008). In effect, the organization's value chain representing the fourth step of organization resources defines these generic systems discussed in the latter part of this paper based on the Key Themes underscoring the education establishments.

The 5-Levels-Analysis, Development & Alignment (5-Levels-ADA) Framework

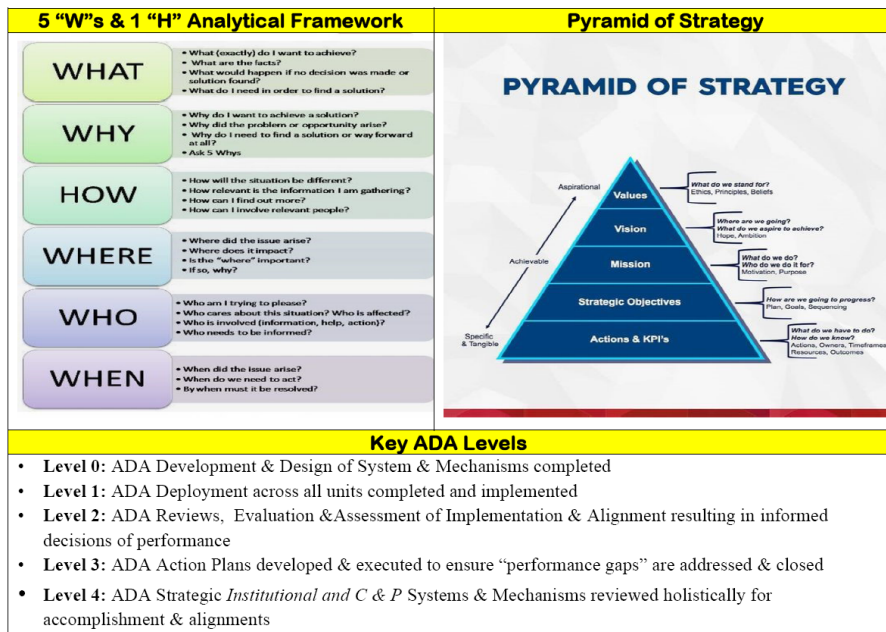


Figure 2: 5-Levels-ADA Framework of Strategic & Operational Alignment

While the 5-Levels-ADA Framework might seem complex or complicated, this is easily mitigated by using two widely accepted PDCA approaches and the mindset analytical rationalization 5 W + 1 H approaches (Fig.4). These two approaches are known to all. If applied as the primary approach to dealing with issues and finding solutions through a cause-effect or root-cause analytical mindset, these two are the most fundamental that anyone without much-advanced knowledge or skills in quality assurance or decision-making knowledge can apply. This represents the "critical thinking" aspect of decision-making of approaching a problem through 5-Levels-ADA using the 5 W + 1 H approach. The first W is defining **WHAT** the problem is, followed by the **WHY** is it a problem of comprehensively analyzing, determining the cause-effect or source of the problem, the **WHY** is the problem important, and the consequences of not addressing it. Based on the second **WHY** it will define the **WHAT** solution is to be made, **WHEN** will it be accomplished, and most importantly, **WHO, HOW & WHERE** it will be performed. Most people often overlook this simple problem-solution analytical mindset and approach for a more complex and non-inclusive framework as they are the same generic approach but framed as new concepts and using different language or wordings.

The strategic framework starts with identifying "who we are, what we can do best, when and where we do it, and how we can do it through our capacities and capabilities" the essential foundational organizational Vision, Mission, Goals, Values, and SMART Objectives that flows from aspiration dreams to achievable capacities & capabilities to actionable performance metrics as demonstrated in the Strategy Pyramid (Fig.2). The 5-Levels-ADA Framework applies critical & analytic thinking to constantly, consistently & coherently review the primary organizational purpose of VMGV and SMART Objectives and its enablers of the organization's resources, capacities & capabilities, and ultimately the various management systems & mechanisms that are developed, deployed and checked for accomplishment with remedial actions in place to address potential performance gaps (Figs.1 & 2). The 5-Levels-ADA calls for constantly determining whether the organization's resources, systems & mechanisms, and capacities & capabilities are analyzed, developed,

and aligned across the board using the 5-Levels criteria of L0 to L4, which is an iterative, recursive approach (Fig.3).

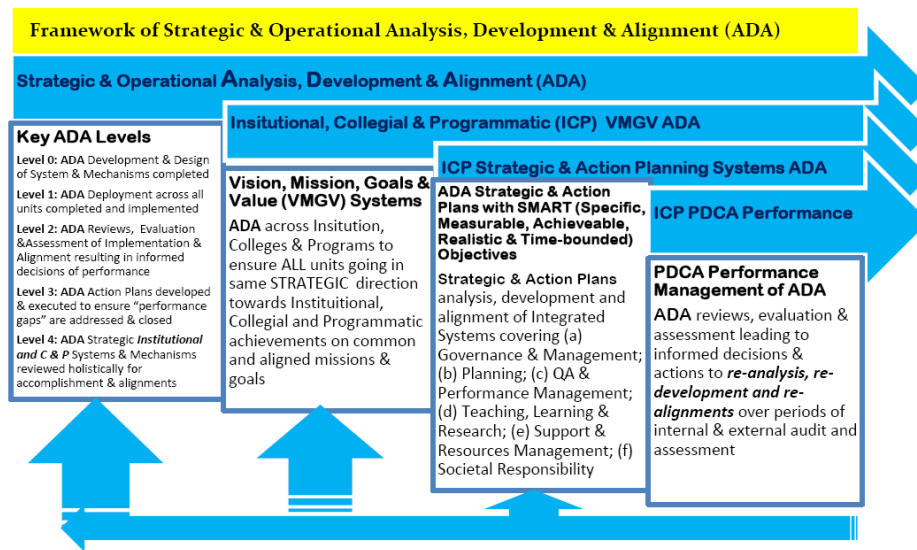


Figure 3: Strategic & Operational 5-Levels-Analysis, Development & Alignment (ADA.) Framework

The 5-Levels-ADA framework applies the adapted MBNQA’s assessment ADLI (Approach, Deployment, Learning & Integration) to determine the degree of progress accomplished from the most basic *Level 0* of determining whether the system/mechanisms have been developed (part of the P for Plan of PDCA) before successful deployment or implementation (part of the D for Do of PDCA) in *Level 1* across all organizational units (mainly the academic colleges & programs and administrative service & support systems). *Level 2* is the C for Check of the PDCA that reviews, evaluate, and assesses performance achievements based on the performance metrics that are part & parcel of the SMART Objectives. *Level 3* is the more problematic aspect of developing action plans that address the performance gaps. To avoid a piecemeal approach mostly practiced by all lower-level units of a “problem-solution” mindset without full comprehensive analysis using fishbone or cause-effect techniques to understand the issue at hand and find a solution to the source issue. A fundamental approach in the strategic & operational reviews, part of the strategic alignment aspect of the 5-Levels-ADA approach, is to ensure that vital organizational systems or mechanisms are perused rather than create a specific system unique to a program that is wasteful of resources and potentially might not contribute to the higher levels aspirations or strategic objectives. The alignment guides all these through the 5-Levels-ADA of the Organization and Units purposes of VMGV, SMART Objectives, Capacity & Capabilities, Systems & mechanisms within the foundational organization, infor & human capitals in *Level 4*. Level 4 evaluation is still mostly missing in most of the lower levels’ action planning if approached with a problem-solution mindset without a total 5-Levels-ADA mindset. This missing Level 4 evaluation is one of the most critical to strategic & operation alignment, accomplishments, and achievements by the units and the organization pursuing the same strategic direction.

Case Study of 10 programs alignment using the 5-Levels ADA Framework

Consolidation of the critical Education Themes & Systems meeting Accreditation Criteria

In Saudi Arabia, universities & programs must go for national accreditation by the national accreditation agency, the National Commission for Academic Accreditation and Assessment (NCAAA). At KSU, 29 programs have been accredited, with the majority in the Science & Health Science specialization. Formal accreditation reports reporting the commendations, recommendations & suggestions comments mostly address six critical Program criteria (1) Mission and goals; (2) Program management and quality assurance; (3) Teaching and learning; (4) Students; (5) Faculty members; and (6) Learning resources, facilities, and equipment, against the eight critical institution criteria of (1) Mission, Goals and Strategic Planning; (2) Governance, Leadership and Management; (3) Teaching and Learning; (4) Students; (5) Faculty and Staff; (6) Institutional Resources; (7) Scientific Research and Innovation; and (8) Community Partnerships. While the institution & program criteria are seemingly different, for programs, planning, research, and community responsibility are part and parcel of the faculty responsibilities and are subsumed within Mission & Goal with governance and administration inclusive of leadership spearheading the strategic & operation VMGV & SMART Objectives analysis, development & alignment. Research is enshrined within the Teaching & Learning with Community Responsibility subsumed within Faculty & Staff.

Table 1: 5-Levels-ADA Alignment of ICP Themes across Criteria and Generic Systems

Themes	Criteria	Generic Systems	5-Levels-ADA
Theme One: Strategic Planning and Governance	Standard 1 Strategic Planning	Planning System T11 Vision, Mission, Goals, Values Framework (VMGV); T12 Strategic & Action Plans System (SAPS) analysis, development, design & implementation; T13 Reviews, Evaluation & Assessment via Performance Management System (PMS)	Key ADA Levels • Level 0: ADA Development & Design of System & Mechanisms completed • Level 1: ADA Deployment across all units completed and implemented • Level 2: ADA Reviews, Evaluation & Assessment of Implementation & Alignment resulting in informed decisions of performance • Level 3: ADA Action Plans developed & executed to ensure “performance gaps” are addressed & closed • Level 4: ADA Strategic Institutional and C & P Systems & Mechanisms reviewed holistically for accomplishment & alignments
	Standards 2 Governance and Administration	Governance & Administration System T14 Governance & Administrative Boards & Committees (GABC); T15 Governance & Administrative Reviews, Performance Evaluation & Assessment System (GABC-GARPEAS)	
Theme Two: Quality & Performance Assurance	Standard 3 Quality Assurance	Performance Management System T21 Quality Assurance Plan (QAP); T22 Internal Quality Assurance (IQA) and Performance Management System (PMS); T23 Stakeholders' satisfaction & dissatisfaction (SSDMS); T24 Reviews, Evaluation & Assessment System (REAS); T25 Performance Metrics System (PMS)	
Theme Three: Effectiveness in Teaching and Learning	Standard 4 Teaching and Learning Effectiveness.	Academic System T31 Academic System meeting Governmental requirements (AS-GSA); T32 Academic System in Students' Outcomes (AS-SLO); T33 Academic System on Academic Assessment, Benchmarking and Reviews (AS-PMS); T34 Academic System on Faculty Management (AS-FM); T35 Academic System on Student Internship & Fieldwork (AS-SIF); T36 Academic System on Academic Performance Metrics (AS-PMS); T37 Academic System on Teaching & Learning (AS-TL)	
Theme Four: Student Management and Learning Support	Standard 5 Student Management	Student Management System T41 Student Enrolment & Registration (SMS-SER); T42 Student Management (SMS-SM); T43 Student Academic Services System (SMS-SASS); T44 Student General Support System (SMS-SGSS)	
	Standard 6 Learning Support	Student Learning Support System T45 Student IT & Library Resources System (SLS-SITLR); T46 Student IT & Library Performance Evaluation & Assessment System (SMS-SITLPEAS)	
	Standard 7 Facilities & Equipment	Student Facilities System T47 Student Facilities System (SFS); T48 Student Facilities Performance Evaluation & Assessment System (SMS-FPEAS)	
Theme Five: Financial and Human Resources Management	Standard 8 Financial Management	Financial Management System T51 Finance & Budgeting System (FMS-FBS); T52 Risk Management System (FMS-RMS); T53 Finance & Risk Performance Evaluation & Assessment System (FMS-FRPEAS)	
	Standard 9 Faculty, and Support Staff Management	Human Resources System T53 Personnel Recruitment System (HRS-PRS); T54 Compensation, Benefits & Incentives System (HRS-CBS); T55 Personnel Performance Evaluation & Assessment System (HRS-PEAS); T56 Training & Development System (HRS-TDS)	
Theme Six: Research Productivity and Community Service	Standard 10 Research	Research System T61 Research Management System (RS-RMS); T62 Research Evaluation, Assessment & Rewards System (RS-REARS)	
	Standard 11 Societal & Community Services	Societal & Community Services T63 Societal & Community Services Management System (RS-RMS); T64 Societal & Community Services Performance Evaluation & Assessment System (SCS-SCSPEARS)	

Basically, to facilitate Institutional, Collegial & Programmatic (ICP) 5-Levels-ADA across the institution & program criteria, these criteria can be consolidated into 6 key themes of (1) **Theme One: Strategic Planning and Governance** covering Standards 1 and 2 (Strategic Planning and Organization and Governance); (2) **Theme Two: Quality & Performance Assurance** covering Standard 3 (Quality Assurance); (3) **Theme Three: Effectiveness in Teaching and Learning** covering Standard 4 (Effectiveness of Teaching and Learning); (4) **Theme Four: Student Management and Learning Support** covering Standards 5, 6, and 7

(Management of Student Intake, Institutional Support for the Learning Process, Facilities, and Equipment); **(5) Theme Five: Financial and Human Resources Management** covering Standards 8 and 9 (Financial Management of Program, Provision of Faculty, and Support Staff); and **(6) Theme Six: Research Productivity and Community Service** covering Standards 10 and 11 (Research Productivity of the Program, Institutional Contribution to Community).

The benefit of grouping the criteria into six key themes is the identification of crucial organizational & units’ capacities & capabilities, resources, and systems & mechanisms. This would mean that most of the critical systems & mechanisms can be developed and deployed across the ICP to be perused by the Colleges & Programs. These include the critical policies, protocols, and practices underscoring each of the generic systems available and accessible across all academic & administrative units at all levels down to the individual (Table 1). Inadvertently, this will save time, efforts, and resources to avoid “re-inventing the wheel” that is wasteful across the ICP that operates and is governed within very similar criteria from institution to program or the same program-program performance across the same or different colleges. For example, to address the IQA/PMS performance issues, there are five central generic systems of “**Performance Management System of its key sub-systems of T21 Quality Assurance Plan (QAP); T22 Internal Quality Assurance (IQA), and Performance Management System (PMS); T23 Stakeholders’ satisfaction & dissatisfaction (SSDMS); T24 Reviews, Evaluation & Assessment System (REAS); T25 Performance Metrics System (PMS)**” being put in place and perused by the Colleges & Programs for performance management. Likewise, to address the effectiveness of teaching & Learning, generic critical systems of “**Academic System covering T31 Academic System meeting Governmental requirements (AS-GSA); T32 Academic System in Students’ Outcomes (AS-SLO); T33 Academic System on Academic Assessment, Benchmarking and Reviews (AS-PMS); T34 Academic System on Faculty Management (AS-FM); T35 Academic System on Student Internship & Fieldwork (AS-SIF); T36 Academic System on Academic Performance Metrics (AS-PMS); T37 Academic System on Teaching & Learning (AS-TL)**” need to be developed and aligned across the ICP to ensure consistencies and coherencies in operational accomplishments. Having these generic systems for each of the key themes will make the IQA (Internal Quality Assurance), the PMA (Performance Management Assurance), and accreditation, and addressing accreditation issues be less complicated and time-consuming, and more aligned across the board, allowing for the Programs to do what they are best in, i.e., Teaching, Learning & Research.

Tabulation of Comments across Key Themes

Table 2: Tabulations of comments under Key Themes of 10 Programs

# Programs Reviewed	Total No. of NCAAA Observations						
	Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Total
10	51 (20.1%)	41 (16.2%)	79 (31.2%)	37 (14.6%)	17 (6.7%)	28 (11.1%)	253

In this paper, ten programs in the Science & Health Science groups that are selected show that the bulk of the accreditation comments is in Themes 1, 2 & 3 (20.1%, 16.2%, & 31.2%, respectively), accounting for 67.5% of all observations (Table 2). These Themes 1 to 3 represent the vital strategic areas whereby the ICP must be strong. **Theme 1** is one of the most significant areas of ICP alignment & improvement, covering essential requirements of Strategic Planning, Governance, and Administration. This theme is vital because systematic strategic planning provides the ICP with clear guidelines in terms of policies, protocols & practices, and pathways in terms of capacities & capabilities, resources, systems, and

mechanisms to follow by setting current and future targets and ensuring that all ICP policies, procedures, implementation, and decision-making comply seamlessly with the institutional mission and goals and strategic directions.

Theme Two covers Quality & Performance Assurance which has universal importance as the internal and external quality assurance of ICP performance in terms of students' learning and its outcomes evaluation, assessment, and assurance of teaching & learning that have become a primary concern of higher education providers across the world. Addressing the areas for improvement identified through these ICP reviews is essential to ensure the improvement in the quality of the teaching, learning, and research as guided by its planning, leadership & governance, enabled by the faculty & staff capacities & capabilities, the ICP resources, facilities, systems & mechanisms efficiencies & effectiveness in attaining the ICP VMGV & Strategic Objectives. The performance gaps between the intended and achieved results must be identified and rectified promptly.

Theme Three covers Effectiveness in Teaching and Learning. The development, evaluation, and assessment of teaching and learning effectiveness substantially impact the success of ICP. This is vital for producing the students' desired results to meet the job market requirements and the national and societal agenda. The bottom line is what and how the ICP can create & deliver on education value as the final students' outcomes and contribution to society. This calls for analysis, development, and alignment of the students' soft & hard skills being the priority of the ICP to ensure that the programs' outcomes accomplish not only the programs' but the collegial and institutional aspired VMGV and Strategic Objectives for students.

Stepwise Cascading of Analysis, Development & Alignment (ADA.) Framework

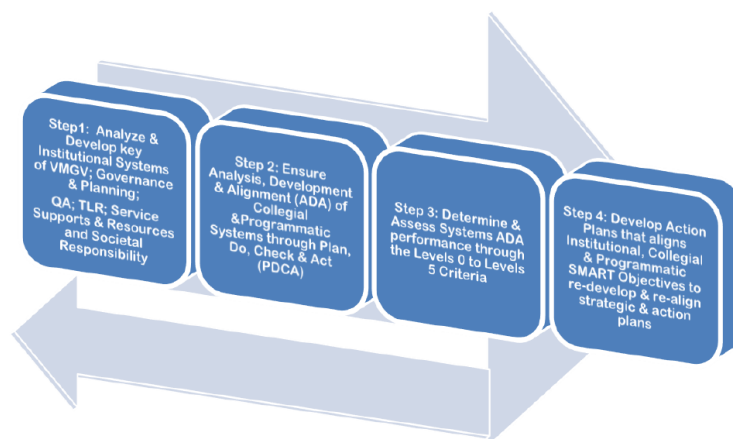


Figure 4: Stepwise Cascading of 5-Levels-Analysis, Development & Alignment (ADA.) Framework While there is no one correct answer to cascading from top-to-bottom or from mid-level to support alignment, this paper builds on the Kaplan and Norton B.S.C. strategy map that shows the cause-effect relationship across all levels of foundation capitals capacity & capabilities needed to utilize the core & supporting processes that enables the creation & delivery of values to meet students' & stakeholders' expectations & requirements, all of which affects the financial bottom line. The BSC gives the leadership accurate, objective, predictive, and actionable information readiness to enhance the organization's strategic resource management dramatically. Most organizations use an iterative process for coordinating and communicating the organization strategy map and its scorecards (Fig.4) that are cascaded from higher-to-lower levels or vice-versa. Ultimately, the organization, units', or personal scorecard

underscoring the PMS monitoring reporting, analysis, and decision-making should be flowing in both directions (Kaplan and Norton, 2006). The higher-level organization scorecard requires an explicit corporate-level strategy that articulates institution themes on value-addition that arise from several sources with common themes that permeate all strategic business units. These common aligned themes define shared organization services and direct interactions and transactions amongst strategic business units that create unique competitive advantages in market segments. These themes and synergies should be explicitly identified, communicated, and linked across the higher-level organization scorecard to the strategic business unit scorecards (Goold et al., 1994; Kaplan and Norton, 2006). As noted earlier, the generic PDCA with five key progressive levels of execution is incorporated into the 5-Levels-ADA framework, as it serves as the framework for cascading critical components of a strategically aligned organization.

Alignment of Vision, Mission, Values & Strategic Level Objectives

As noted previously in Fig. 1, the first essential component of alignment is the “organization purpose,” which is the reason for the organization's existence that is shown as the Values, Mission, Goals, and Values (VMGV) and SMART Objectives of the organization. This is evidenced by the institution’s definition of the VMGV and SMART Objectives to provide a strategic direction and operational platform to achieve the institution VMGV. The norm for most organizational units at the lower levels of the colleges’ VMGV is that they are usually quite aligned with that of the institution. In the case study, the Institutional Vision & Mission of “.....knowledge society andknowledge economy” set the stage of alignment for the CAMS “.....environment that encourages learning and creativity and produces scientific research that contributes to building a knowledge society”; the CBAs “.....building a knowledge-based economy” through its mission of “...advancement of business knowledge and economic development; and building effective partnerships with local and global communities”; and COE’s vision of “...pioneer in engineering education, innovative research, and building knowledge economy” through its mission of “...address the changing needs of future engineers, serve the profession and contribute to the advancement and well-being of the society by creating and disseminating knowledge and technology to future generations through teaching, research, and partnership with industry and government” (Table 3).

The core values across all three colleges emphasize “Excellence or Excelling” through inquiry, teamworking, transparency & accountability, which forms the core culture web that should be practiced across the colleges and programs. This paves the determination of the Strategic Objectives that shows similarity in its educational objective across the 3 colleges as (1) CAMS having 4 of 6 Strategic Objectives (SO1 to 4) of providing excellent academic programs, preparing professionals with high conceptual, professional, leadership, and research skills through an academic and administrative environment that encourages learning, productivity, and creativity; (2) CBAs 2 of 6 SO (SO1 & 3) to deliver an educational environment that ensures the quality of business education by recruiting and retaining high-quality faculty and staff to improve overall performance; and (3) COEs 3 of 6 SO (SO1 to 3) by providing Distinguished and Accredited Academic Programs to Requirements and the Needs of the Job Market According to the Vision of the Kingdom of Saudi Arabia 2030 through preparing Competitive Engineers at both National and International Levels via an Attractive and Stimulating Work Environment for Teaching Staff and Researchers. The VMGV & SMART Objectives from the institution to the three colleges demonstrate a high degree of alignment that captures the education value essences across the institution to the colleges, thus giving the program functionality.

Table 3: Potential Alignment of Vision, Mission, Values & Strategic Level Objectives

Institutional Vision & Mission		Institutional Strategic objectives	
<p>Vision of KSU To be a world-class university and a leader in building the knowledge society</p> <p>Mission of KSU To provide distinctive education, produce creative research, serve society and contribute to building the knowledge economy and community through learning, creative thinking environment, the optimal use of technology, and effective international partnership.</p> <p>Core Values of KSU</p> <ul style="list-style-type: none"> Quality and excellence Leadership and teamwork Freedom of inquiry Fairness and integrity Transparency and accountability Lifelong learning 		<p>Strategic Objectives of KSU</p> <p>Strategic objective #1 – Good everywhere; Great in focus areas. (Strengthen our comprehensive university with academic areas of research and teaching excellence)</p> <p>Strategic objective #2: Distinctive faculty (Attract and develop distinctive faculty)</p> <p>Strategic objective #3: Less is more (Reduce KSU’s student volume, increase the share of graduate students and raise entry requirements)</p> <p>Strategic objective #4: Stronger graduates. (Enable KSU students to learn hard and soft skills throughout their academic life)</p> <p>Strategic objective #5: Building bridges. (Build bridges among KSU constituencies and externally with local and international groups)</p> <p>Strategic objective #6: Supportive learning environment (Create an engaging environment at KSU for faculty, students, and staff)</p> <p>Strategic objective #7: Sustainable future. (Build KSU’s endowment and diversity sources of funding)</p> <p>Strategic objective #8: Flexibility and Accountability (Create a performance contract between KSU and the government)</p> <p>Strategic objective #9: Organizing for purpose (Establishing an organization and governance that supports KSU’s goals)</p>	
#	Baccalaureate Programs	Collegial Vision & Mission and selected Strategic Objectives of 3 Case Studies	
1	Biomedical Technology	<p>Health Science (5 Colleges)</p> <p>Case Study 1: Vision of College of Applied Medical Science (CAMS) "Regional leadership with a global reputation in the fields of applied medical sciences"</p> <p>Mission "To contribute to the promotion of the health services for the Saudi community through producing qualified professionals with the ability to compete internationally in applied medical professions, to provide an environment that encourages learning and creativity, and to produce scientific research that contributes to building a knowledge society".</p> <p>Strategic Objectives (4 of 6)</p> <p>SO1 Provide excellent academic programs according to quality standards and academic accreditation. SO2 Prepare health care professionals with high conceptual, professional, leadership, and research skills. SO3 Provide an academic and administrative environment that encourages learning, productivity, and creativity. SO4 Support for performing and publishing applied medical research that contributes to technological and medical advances.</p> <p>Values</p> <ul style="list-style-type: none"> Quality and excellence Leadership and teamwork Freedom of inquiry Fairness and integrity Transparency and accountability Lifelong learning 	
2	Medicine and Surgery		
3	Microbiology		
4	Science in Nursing		
5	Dental Surgery		
6	Business Administration	<p>Science (6 Colleges)</p> <p>Case Study 2: Vision of College of Business Administration (CBA) "To be a leader in business education and research, at the national and international levels, contributing to building a knowledge-based economy"</p> <p>Mission "Creating a distinctive educational environment to prepare business professionals and leaders with international perspectives; conducting research that contributes to the advancement of business knowledge and economic development, and building effective partnerships with local and global communities."</p> <p>Strategic Objectives (2 of 6)</p> <p>SO1 Deliver an educational environment that ensures the quality of business education at the CBA. SO3 Recruit and retain high-quality faculty and staff to improve the overall performance of the college.</p> <p>Values</p> <ul style="list-style-type: none"> Excellence Accountability Team Spirit Transparency Responsiveness 	
7	Economics		
8	Mechanical Engineering	<p>Case Study 3: Vision of College of Engineering (COE) "To be a world-class college and a pioneer in engineering education, innovative research and building knowledge economy"</p> <p>Mission "To provide high-quality education programs that address the changing needs of future engineers, serve the profession and contribute to the advancement and well-being of the society by creating and disseminating knowledge and technology to future generations through teaching, research, and partnership with industry and government"</p> <p>Strategic Objectives (3 of 6)</p> <p>SO1 Provide Distinguished and Accredited Academic Programs that Meet Development Requirements and the Needs of the Job Market According to the Vision of the Kingdom of Saudi Arabia 2030. SO2 Prepare Competitive Engineers at both National and International Levels. SO3 Provide Attractive and Stimulating Work Environment for Teaching Staff and Researchers.</p> <p>Values</p> <ul style="list-style-type: none"> To excel at what really matters, and to aspire to the needs of society. To treat individuals with dignity and respect; judge without partiality, critique without contempt, & encourage without reserve. To value diversity and support – hearten and promote – creativity. 	
9	Civil Engineering		
10	Botany	Not included as Case Study	

Mapping of Comments to Themes, Action Plans, and Generic Systems

Table 4: Comments consolidated within Theme 1 of Strategic Planning & Governance

Theme One: Strategic Planning and Governance Institutional, Colleges & Programs (C&P) Alignments			
Key Issues	Sub-Themes	Institutional Actions	Colleges & Programs (C & P) Actions
1. Dissemination of mission at each level to all stakeholders.	T11 Vision, Mission, Goals, Values Framework (VMGV) development, design & review with stakeholders involvement	Institution VMGV Framework on development, design & review, guidelines, policies & protocols	C & P Utilize Institutional VMGV Framework for C & P vision, mission, & values development & alignment
2. Involvement of the key stakeholders, including consultation with the employers in designing and reviewing the mission.			
3. Reflection of community engagement in mission statement.			
4. Development of the systematic strategic plan following mission.	T12 Strategic & Action Plans Systeme (SAPS) analysis, development, design & implementation	Institution SAPS on development, design & review, with specific guidelines, policies & protocols	C & P Utilize Institution SAPS development, design & review, with specific guidelines, policies & protocols to guide strategic & operational actions
5. Inclusion of the updated SWOT analysis report.			
6. Development of the action plan for each measurable goal and objective following the mission.			
7. Development of the risk management plan based on the updated SWOT analysis.			
8. Development of the revision policy for the periodic review of the mission and strategic plan.			
9. Setting up evaluation criteria to measure the achievements.	T13 Reviews, Evaluation & Assessment via Performance Management System (PMS)	Institution PMS for Reviews & Assessment based on Strategic Objectives aligned with VMGV	C & P utilize Institution PMS to develop C & P for academic & admin performance management & alignments
10. Regular review of the policies, procedures, mission, & goals.			
11. Use of KPIs to monitor the performance in deficient areas.			
12. Formulation of committees for benchmarking and assessing KPIs, PLOs, and CLOs.			
13. Expansion of the University/College Industry Advisory Board to include members from industry and government in all areas of engineering-related disciplines/fields.	T14 Governance & Administrative Boards & Committees (GABC)	Institution Governance & Administrative Boards & Committees Framework, Policies & Protocols	C & P Utilize Institution GABC for C & P governance set-ups & management
14. Revision of composition and terms of reference of all governing/review committees & monitoring of performance.			
15. Proper documentation and recordkeeping of all meeting minutes, agenda items, and their compliance on e-portal.			
16. Implementation of the uniform and standardized curriculum, teaching methodologies, and assessment methodologies in male and female sections.	T37 Academic System on Teaching & Learning (AS-TL)	Dealt with under Teaching & Learning	
17. Implementation of policies, rules, and regulations, and periodic monitoring of the compliance of the same.		Institution AS-TL covers academic & curriculum, faculty & student academic services, and quality assessment & assurances policies & protocols.	C & P Utilize Institution AS-TL to develop & manage C & P AS-TL academic practices, policies, protocols, and QA
18. Development of the benchmarking framework and an activities chart/calendar containing the timeline.			

Once the program receives the accreditation report comments, some of the critical steps, using Key Theme 1 of Strategic Planning & Governance to illustrate the 5-Levels-ADA Framework as:

1. **The First Step** is to consolidate the comments and map them into one of the critical Themes 1 to 6 (Table 1) and sub-themes of Theme 1 (Table 4). The sample discussion here is delimited to Theme 1 of Strategic Planning and Governance, of which five main sub-themes can be mapped into as **T11 Vision, Mission, Goals, Values Framework (VMGV) development, design & review with stakeholders involvement; T12 Strategic & Action Plans System (SAPS) analysis, development, design & implementation; T13 Reviews, Evaluation & Assessment via Performance Management System (PMS) T14 Governance & Administrative Boards & Committees (GABC); and T37 Academic System on Teaching & Learning (AS-TL)**. It should be noted that the 18 comments have only 1 to 15 that deal with the Strategic Plan & Governance, whereas the comments 16 to 17 better fit into the Teaching & Learning Theme T3.
2. **The Second Step** addresses the actions at the ICP levels to be taken by matching the generic systems needed for these four planning & governance sub-themes. In this case, there are two central generic systems with appending sub-systems of **Planning System T11 Vision, Mission, Goals, Values Framework (VMGV); T12 Strategic & Action Plans System (SAPS) analysis, development, design & implementation; T13 Reviews, Evaluation & Assessment via Performance Management System (PMS) and Governance & Administration System T14 Governance & Administrative Boards & Committees (GABC); T15 Governance & Administrative Reviews, Performance Evaluation & Assessment System (GABC-GARPEAS)**.

Table 5: Determine Action Plans based on PDCA of the Sub-Themes

Theme One: Strategic Planning and Governance Institutional, Colleges & Programs (C & P) Alignments				
Sub-Themes 1	Sub-Themes 1 PDCA (Plan, Do, Check & Act) Strategic Actions	Sub-Themes 1 Colleges & Programs Actions		
T11 Vision, Mission, Goals, Values Framework (VMGV) development, design & review with stakeholders involvement	P Institutional VMGV Development & Design	C & P utilize Institutional VMGV Framework for C & P vision, mission, & values development & alignment	P C & P VMGV Development & Design	
	D Institutional VMGV deployed across all units		D C & P VMGV deployed across all units	
	C Institutional VMGV reviews for accomplishment		C C & P VMGV reviews for accomplishment	
	A Institutional VMGV Action Plans remedies		A C & P VMGV Action Plans remedies	
T12 Strategic & Action Plans System (SAPS) analysis, development, design & implementation	P Institutional SAPS Development & Design	C & P utilize Institution SAPS development, design & review to guide strategic & operational actions	P C & P SAPS Development & Design	
	D Institutional SAPS deployed across all units		D C & P SAPS deployed across all units	
	C Institutional SAPS reviews for accomplishment		C C & P SAPS reviews for accomplishment	
	A Institutional SAPS Action Plans remedies		A C & P SAPS remedies	
T13 Reviews, Evaluation & Assessment via Performance Management System (PMS)	P Institutional PMS Development & Design	C & P utilize Institution PMS to develop C & P for academic & admin performance management & alignments	P C & P PMS Development & Design	
	D Institutional PMS deployed across all units		D C & P PMS deployed across all units	
	C Institutional PMS reviews for accomplishment		C C & P PMS reviews for accomplishment	
	A Institutional PMS Action Plans remedies		A C & P PMS Action Plans acted remedies	
T14 Governance & Administrative Boards & Committees (GABC)	P Institutional GABC development & Design	C & P utilize Institution GABC for C & P governance set-ups & management	P C & P GABC Development & Design	
	D Institutional GABC deployed across all units		D C & P GABC deployed across all units	
	C Institutional GABC reviews for accomplishment		C C & P GABC reviews for accomplishment	
	A Institutional GABC Action Plans remedies		A C & P GABC Action Plans remedies	
T37 Academic System on Teaching & Learning (AS-TL)	P Institutional AS-TL Development & Design	C & P utilize Institution AS-TL to develop & manage C & P AS-TL academic practices, policies, protocols, and QA	P C & P AS-TL Development & Design	
	D Institutional AS-TL deployed across all units		D C & P AS-TL deployed across all units	
	C Institutional AS-TL reviews for accomplishment		C C & P AS-TL reviews for accomplishment	
	A Institutional AS-TL Action Plans remedies		A C & P AS-TL Action Plans remedies	

3. **The Third Step** is the main application of using the PDCA to check on the degree of the generic thematic systems of each sub-themes T11 to T14 and T37 at the ICP levels (Table 5). The simple logic of PDCA is to determine the degree of actions needed to formulate the action plans. If P does not exist, start with P. If P has been developed, then check for the D for doing or deployment, and if they are not deployed, determine what, where, when who, why, and how they are to be deployed.

If they are fully deployed, apply C to check the effectiveness and efficiencies. Afterwhich preparing plans for remedial actions.

Table 5.1: Matching the thematic PDCA aligned actions of ICP via 5-Levels ADA Framework

Theme One: Strategic Planning and Governance Institutional, Colleges & Programs (C & P) Alignments			
Sub-Themes 1	Institutional PDCA Strategic Actions	Colleges & Programs Actions	Analysis, Development & Alignment
T11 VMGV (Vision, Mission, Goals, Values) development, design & review with stakeholders involvement	P Institutional VMGV Development & Design	P C & P VMGV Development & Design	Level 0: ADA Development & Design of System & Mechanisms completed
	D Institutional VMGV deployed across all units	D C & P VMGV deployed across all units	
	C Institutional VMGV reviews for accomplishment	C C & P VMGV reviews for accomplishment	
T12 Strategic & Action Plans System (SAPS) analysis, development, design & implementation	A Institutional VMGV Action Plans remedies	A C & P VMGV Action Plans remedies	Level 1: ADA Deployment across all units completed and implemented
	P Institutional SAPS Development & Design	P C & P SAPS Development & Design	
	D Institutional SAPS deployed across all units	D C & P SAPS deployed across all units	
T13 Reviews, Evaluation & Assessment via PMS (Performance Management System)	C Institutional SAPS reviews for accomplishment	C C & P SAPS reviews for accomplishment	Level 2: ADA Reviews, Evaluation & Assessment of Implementation & Alignment resulting in informed decisions of performance
	A Institutional SAPS Action Plans remedies	A C & P SAPS Action Plans remedies	
	P Institutional PMS Development & Design	P C & P PMS Development & Design	
T14 Governance & Administrative Boards & Committees (GABC) Framework, Policies & Protocols	D Institutional PMS deployed across all units	D C & P PMS deployed across all units	Level 3: ADA Action Plans developed & executed to ensure "performance gaps" are addressed & closed
	C Institutional PMS reviews for accomplishment	C C & P PMS reviews for accomplishment	
	A Institutional PMS Action Plans remedies	A C & P PMS Action Plans remedies	
T37 Academic System on Teaching & Learning (AS-TL)	P Institutional GABC development & Design	P C & P GABC Development & Design	Level 4: ADA Strategic Institutional and C & P Systems & Mechanisms reviewed holistically for accomplishment & alignments
	D Institutional GABC deployed across all units	D C & P GABC deployed across all units	
	C Institutional GABC reviews for accomplishment	C C & P GABC reviews for accomplishment	
T37 Academic System on Teaching & Learning (AS-TL)	A Institutional GABC Action Plans remedies	A C & P GABC Action Plans remedies	
	P Institutional AS-TL Development & Design	P C & P AS-TL Development & Design	
	D Institutional AS-TL deployed across all units	D C & P AS-TL deployed across all units	
T37 Academic System on Teaching & Learning (AS-TL)	C Institutional AS-TL reviews for accomplishment	C C & P AS-TL reviews for accomplishment	
	A Institutional AS-TL Action Plans remedies	A C & P AS-TL Action Plans remedies	

4. **The Fourth Step** is the application of the 5-Levels-ADA Framework as it calls for a more detailed analysis of the PDCA cycle accomplishment and achievements based on the five levels of analysis-development-alignment of the ICP resources, systems & mechanisms, and capacities & capabilities that enables the performance of the ICP at all levels (Table 5.1). Using the 5-Levels-ADA approach can provide more in-depth analysis and alignment of performance gaps to provide a better picture and appropriate action plans. The PDCA strategy execution is supplemented by the performance levels of the 5-Levels-ADA approach to better understand the 5Ws + 1 H of the cause-effect or root-cause analysis. Table 5.2 shows the more in-depth ADA.

Table 5.2: Matching the ICP PDCA aligned actions via 5-Levels-ADA Framework

Theme One: Strategic Planning and Governance Institutional, Colleges & Programs (C & P) Alignments			
Sub-Themes 1	Institutional PDCA Analysis & Development Actions	Colleges & Programs Analysis, Development & Alignment Actions	
T11 VMGV (Vision, Mission, Goals, Values) development, design & review with stakeholders involvement	P Institutional Development & Design	Level 0: Development & Design of VMGV System & Mechanisms completed	P C & P VMGV Development & Design
	D Institutional VMGV deployed across all units	Level 1: VMGV System & Mechanisms Deployment across all units completed and implemented	D C & P VMGV deployed across all units
	C Institutional VMGV reviews for accomplishment	Level 2: VMGV System & Mechanisms Reviews, Evaluation & Assessment of Implementation & Alignment resulting in informed decisions of performance	C C & P VMGV reviews for accomplishment
	A Institutional VMGV Action Plans remedies	Level 3: VMGV System & Mechanisms Action Plans developed & executed to ensure "performance gaps" are addressed & closed	A C & P VMGV Action Plans remedies
T12 Strategic & Action Plans System (SAPS) analysis, development, design & implementation	P Institutional SAPS Development & Design	Level 0: Development & Design of SAPS System & Mechanisms completed	P C & P SAPS Development & Design
	D Institutional SAPS deployed across all units	Level 1: SAPS System & Mechanisms Deployment across all units completed and implemented	D C & P SAPS deployed across all units
	C Institutional SAPS reviews for accomplishment	Level 2: SAPS System & Mechanisms Reviews, Evaluation & Assessment of Implementation & Alignment resulting in informed decisions of performance	C C & P SAPS reviews for accomplishment
	A Institutional SAPS Action Plans remedies	Level 3: SAPS System & Mechanisms Action Plans developed & executed to ensure "performance gaps" are addressed & closed	A C & P SAPS Action Plans remedies
T13 Reviews, Evaluation & Assessment via PMS (Performance Management System)	P Institutional PMS Development & Design	Level 0: Development & Design of PMS System & Mechanisms completed	P C & P PMS Development & Design
	D Institutional PMS deployed across all units	Level 1: PMS System & Mechanisms Deployment across all units completed and implemented	D C & P PMS deployed across all units
	C Institutional PMS reviews for accomplishment	Level 2: PMS System & Mechanisms Reviews, Evaluation & Assessment of Implementation & Alignment resulting in informed decisions of performance	C C & P PMS reviews for accomplishment
	A Institutional PMS Action Plans remedies	Level 3: PMS System & Mechanisms Action Plans developed & executed to ensure "performance gaps" are addressed & closed	A C & P PMS Action Plans remedies
T14 Governance & Administrative Boards & Committees (GABC) Framework, Policies & Protocols	P Institutional GABC development & Design	Level 0: Development & Design of GABC System & Mechanisms completed	P C & P GABC Development & Design
	D Institutional GABC deployed across all units	Level 1: GABC System & Mechanisms Deployment across all units completed and implemented	D C & P GABC deployed across all units
	C Institutional GABC reviews for accomplishment	Level 2: GABC System & Mechanisms Reviews, Evaluation & Assessment of Implementation & Alignment resulting in informed decisions of performance	C C & P GABC reviews for accomplishment
	A Institutional GABC Action Plans remedies	Level 3: GABC System & Mechanisms Action Plans developed & executed to ensure "performance gaps" are addressed & closed	A C & P GABC Action Plans remedies
T37 Academic System on Teaching & Learning (AS-TL)	P Institutional AS-TL Development & Design	Level 0: Development & Design of AS-TL System & Mechanisms completed	P C & P AS-TL Development & Design
	D Institutional AS-TL deployed across all units	Level 1: AS-TL System & Mechanisms Deployment across all units completed and implemented	D C & P AS-TL deployed across all units
	C Institutional AS-TL reviews for accomplishment	Level 2: AS-TL System & Mechanisms Reviews, Evaluation & Assessment of Implementation & Alignment resulting in informed decisions of performance	C C & P AS-TL reviews for accomplishment
	A Institutional AS-TL Action Plans remedies	Level 3: AS-TL System & Mechanisms Action Plans developed & executed to ensure "performance gaps" are addressed & closed	A C & P AS-TL Action Plans remedies
T37 Academic System on Teaching & Learning (AS-TL)		Level 4: AS-TL System & Mechanisms reviewed holistically for accomplishments & alignments	

Themes 2 and 3 illustrate (Appendix 1 & 2) the same logic & rationale in the use of the 5-Levels-ADA Framework to align the programs with the colleges and institutions.

Strategic Alignment via a Performance Management System

Fonvielle and Carr (2001) identified alignment as a key factor for organizational effectiveness with crucial steps of (1) articulation of critical strategic goals with performance measures for each of these goals, the key strategic drivers of the business, and the main areas of focus for the organization's success; (2) Communicate the measures and make sure everyone understands the measures and their linkage to the strategic goals with the linkage of each measure to a formal feedback and recognition system and communication of the results, and (3) reviewing the goals' performance and developing corrective actions through Performance Management Dashboards (Eckerson, 2006).

Teay (2021) proposed an integrated electronic Strategic Performance Management System (SPMS) that can be used for organizational alignment. This SPMS is built based on the accreditation criteria that comprehensively address the six main education themes for the ICP. The SPMS highlights vital requirements of:

- **Performance Reviews and Goal-Setting** – The SPMS allows for people to set goals that are tied to organizational objectives and review those goals that cover all the critical accreditation criteria addressing the education themes requirements at any time, with crucial administrators easily tracking the progress of these goals and ensuring they are being met.
- **Competencies and Skills Matrix** – In the SPMS, administrators can use the system to gain insight into people's skills and performance in meeting objectives and close any skill or performance gaps that may exist by matching the right person to specific tasks aligning talent to the organization. This is the crux of the organization's capacities & capabilities that is key to the human capital utilizes the systems & mechanisms as enablers to achieve the SMART Objectives via the strategies.
- **Continuous Feedback** – Through the SPMS platform, organizations can promote an environment of continuous feedback and coaching of people by their supervisors who can communicate with people about their performance and goals and offer real-time feedback, forging stronger relationships. This enables faster, more efficient, and effective ADA approaches for strategic execution.
- **Observation Checklist.** With the SPMS mechanism, employees' skills or performance are automatically recorded in real-time with their competency or performance being assessed, thereby eliminating the need for paper-based evaluations, which only add to the complexity of an organization.

The key to using the SPMS for alignment across the organizational, team, and employee goals include (1) Setting clear organizational goals & SMART Objectives based on the organization's mission & vision that starts at the top. The organization's goals with crystal clear objectives should be targeted, strategic, and built around a vision the entire organization can share; (2) Ensure buy-in from leadership to effectively communicate them and drive alignment on the ground by the leaders; (3) Clear and consistent communication at every level of the organization goals for goals and accountabilities being communicated, clarified & committed, whereby people 2.8x is more likely to be highly engaged; and (4) Help people achieve their goals as people cannot succeed in a vacuum as they need the team and organizational support like training and development to build the skills and knowledge with

appropriate tools, mechanisms, or systems they need to succeed to set and achieve their goals with continuous feedback of accomplishments.

Implications

As discussed earlier, this paper has discussed two key alignment issues of the VMGV & Strategic Objectives and Strategic and Operation Plans of the ICP in an HEI. A key issue is addressing the action plans based on accreditation reports that can potentially be developed without ensuring that they meet and address the issue holistically to accomplish the ICP Strategic Objectives. To ensure that action plans are not devised and developed piecemeal that undermine the beneficial achievement of the ICP Strategic Objectives, this paper proposes an oft-forgotten simplistic approach to decision-making and actions through the 5-Levels-ADA Framework with the necessary implications:

- ***Fundamental Critical & Analytical Thinking Approach*** – The two generic principles utilized are the PDCA or its adapted version and the use of the 5 Ws + 1H that underline the critical and analytical thinking processes of the Human Capital to determine and analyze the issues at hand and to develop an appropriate solution that is aligned through the ADA framework. The 5-Levels-ADA Framework, in effect, provided a more detailed analysis and aligned ADLI (Approach, Deployment, Learning, and Integration) evaluation method to determine the missing aspects of the perusal of generic systems and mechanisms or policies, protocols & practices issues that have not been applied based on these systems or mechanisms. In addition, it facilitates the strategic and operational alignment analysis to ensure that the diverse & multidisciplinary programs and colleges move in tandem in togetherness towards the same strategic direction.
- ***Generic Systems & Mechanisms Approach*** – Six education themes for quality & performance assurance can be generalized and standardized across the whole ICP as they form the primary mission of any HEI. These 6 HEI's themes are teaching, learning & research, leadership & governance, quality & performance assurance, facilities, services & supports, financial & human resources, and societal or community responsibilities. Since they are generalized and standardized across the board to meet the ICP mission & goals, generic management systems and mechanisms can be developed centrally for the colleges & programs to pursue. This avoids the “re-inventing the wheel” as they serve similar missions, goals, and objectives, thereby minimizing resource wastage by optimizing resource sharing and allowing the colleges & programs to focus on what they do best. This will ensure an alignment of resources and management systems that serve the whole ICP holistically.
- ***Performance Management and Data Analytics Approach*** – Another critical area for efficiencies and effective management is the key strategic performance metrics that can be developed centrally and aggregated from individual to program to college to institution levels. These can be used for comparative evaluations to share and learn best practices and to address critical performance gaps of specific units based on data analytics. The PMS allows for better and more aligned performance management based on key metrics that measure what they are supposed to measure that supports better and more aligned issue-solution mitigations.
- ***Strategic and Operational Alignment Approach*** – The 5-Levels-ADA Framework provides a simple approach to determine and ensure strategic and operational alignment through the basic directional VGMV and Strategic Objectives across the ICP. Once these are analyzed and determined for alignment, it ensures that the

operational and action plans are designed, developed, implemented, and assessed for performance for alignment, accomplishment, and achievements across the ICP. The 5-Levels L0 to L4 provide a progressive evaluation and assessment to ensure that the higher levels of alignment and accomplishments are established and managed for performance towards the same strategic direction.

Recommendations

The key to organizational success is to focus on the organization's strategy, its alignment across the different strategic & operation levels by other actors, and how they are expected to create future, sustainable value (Khadem & Khaddar, 2008; Ryba, 2021). LSA (2021) highlighted four successful strategy execution keys underscoring the aligned strategic and operational plans (Armistead et al., 1999; Trkman, 2010) as (1) Strategic Clarity accounting for 31% of the gap between high and low-performing organizations in having strategies that are clear, believable, and implementable enough to people expected to implement them; (2) Step-by-Step Policies, Protocols & Practices Guidelines guiding the actions within the operation action plans; (3) Changing agility and developing a Learning Mindset to learn, adapt and address changes with an open mindset; and (4) Performance Measures and Management definition, implementation, and evaluation of strategy execution based on SMART performance metrics. These underscore the importance of the firm foundation of the vital organization, infor, and human capital that enables the human capacity & capabilities (Teay, 2022; Frangos, 2002; Garvin, 2000) to make informed decisions and actions to create and deliver on the education values meeting or excelling in students & stakeholders expectations and requirement, thus strengthening or achieving the overall institution financial performance (Kaplan & Norton, 2006 & 2008; Papp, 2001; Luftman et al., 1993).

Aligning quality and process improvement programs with strategy starts with the value proposition that is the heart of a strategy, practically, the educational value created and delivered to the students & stakeholders. The imperative is to create synergies across the units' processes by focusing on developing, aligning, and achieving the critical process objectives through the organization's strategy map (Kaplan and Norton, 2006) and its business model (Zott and Amit, 2006). This includes the learning and growth objectives that drive the critical process improvements. For organization & individual learning & growth, Human Capital is a strategic source of value creation, potentially the company's most valued asset in today's knowledge-based economy (Frangos, 2002; Garvin, 2000). Human Capital's dimensions most relevant to strategic success include (1) Strategic Skills/Competencies, (2) Leadership, (3) Culture and Strategic Awareness, and (4) Strategic Alignment, Integration, and Learning (Fitz-enz, 2000). The primary management systems underscoring strategic alignment that can impede alignment and that need to be addressed preemptively are:

- **Leadership & Governance System (LGS)** – In all accreditation or Performance Excellence requirements, Teay (2022) highlighted the imperatives of leadership within the senior leadership & management system as a critical driver to not only lead but to guide, engage & commit to the ICP teams, in a “we walk together” avoiding the talk only (NATO – No Actions but Talk Only) mentality. Without a solid & sound leadership & governance system guiding commitment, all is left to the people to soldier on aimlessly and listlessly. The leaders at all levels of the ICP should be the frontman and champion of the organization & unit's first line of

offense & defense. They are the rallying clarion call for unity behind the flag and waving the excellence banners, leading the troops, motivating and engaging the teams towards a unified & aligned strategic direction based on the VMGV and strategic objectives and achievements. Lacking this pre-requisite, all else fails or is accomplished piecemeals in mediocre gains & benefits.

- **Organization Shared Values & Culture System (OSVCS)** – As highlighted by the McKinsey 7S framework, shared values that are the foundation of the organization’s culture are the “culture-web” seamlessly knitting the organization, team, and individual commitment of a singular “who, what & why we are & how we operate” (Waterman et al. 1980; Bradach, 1996). This is reflected in the alignment of the units’ & individual values with that of the organization as “sum of total” against “sum of parts” performance accomplishments and achievements. The OSVCS is the crux of the commitment of the human capital towards the same organization and units’ strategic directions that underlie the strategic alignment. Lacking the OSVCS as the critical factor in melding together the fragile units’ cooperation, collaboration, coordination & commitments are crucial to organizational performance and success.
- **Data-Driven Institution (DDI)** – Most institutions have been working with data, data & data in legacy silo-formed storages across different & diverse units, undermining a sharing & learning mindset, as all are bent on protecting their data as “information is power” (Teay, 2019). This work environment can slog on without benefiting from a data-driven approach. Assur and Rowshankish (2022) highlighted some critical characteristics of the data-driven enterprise as (1) Data is embedded in every decision, interaction, and process that should be processed and delivered in real-time; (2) Flexible & Central data stores enable integrated, ready-to-use data based on a Data operating model treating data like a product that is to be shared cross board to generate value with Data-ecosystem memberships being the norm and (3) Data & Information management is to be prioritized and automated for privacy, security, and resiliency, and used as wisdom rather than just information underscoring informed decisions and actions. Key enablers include a vision and data strategy to highlight and prioritize transformational use cases for data; AI technology enablers like cloud-based infrastructure with architectures that support real-time data analytics (Teay, 2019); and flexible database/data-model tooling to support querying of unstructured data and most importantly, an overall organizational data literacy and a data-driven culture. This calls for upskilling people & data literacy for data use and data analytics (Brown et al., 2019) based on an established business & data architecture to understand integration across assets, processes, insights, and interventions and to enable the identification of real-time opportunities with more powerful computing and advanced-connectivity infrastructures. The data architecture should define a clear, unified data strategy that identifies and prioritizes business cases for data, understanding the organization’s data sources and the types of data through an operating model that establishes a data product owner/team and identifies standard data models to facilitate ease of data collaboration, development of data alliances and sharing agreements.
- **Organization Performance Management System (OPMS)** – For maximum impact, therefore, the performance measurement and management system, preferably an electronic system (Teay, 2017 & 2021), must measure the critical few parameters that represent its strategy for long-term value creation (Teay, 2021; Campbell, 2006; Waldersee, 1999) in line with “management through measurements” (Sinclair and Zairi, 1995; Norman, R. 2002). As Lorence (2010) noted,

performance measures are “data, data and data” of KPIs from different & diverse sources with aggregations or summations from lower-higher levels that must ensure accuracy & reliability when building PMS. Dashboards. Performance Measures and Management is critical to increasing responsibility & accountability, creating transparency, and celebrating success through relevant, fair, accurate, trusted, meaningful, and timely leading and lagging metrics with feedback to prompt discussions and improvements to the plan to maintain continuity, collaboration, and commitment. Performance evaluation should not focus on negative aspects of performance as it affects reinforcement of the positive elements of decisions (Simon, 2000; Hussey and Ong, 2012). As such, performance measures should preferably create desirable motivation, encourage communication and the exchange of information among and across units of decisions & actions, calling for positive organizational scholarship principles (Cameron et al., 2003) to performance evaluation metrics to make the evaluation process more effective. Using performance measures framed positively can help generate more creativity, problem-solving ability, and excellent communication among and across units leading to progress toward organizational objectives (Fredrickson & Losada, 2005).

- **Strategy and Operational Review System (SORS)** – Strategy and operational reviews represent the essential feedback and control stages of the PMS. In TQM, they are the check and act portions from the plan-do-check-act cycle of the strategy implementation process (Kaplan and Norton, 2008). The Steps-by-Steps guidelines are broken down into the specific “how” at the individual, team, and organizational levels with a clear line of sight, each function, and each group. Each employee understands precisely how they are to operate & commit, and where and when they will interact with others, basically the “who knows what, why, where, how to do & perform and when in the next 90-days”. These reviews of the 90-day reviews include two main techniques of standard costing and budgetary control to analyze departures from the plan (Hussey and Ong 2012). The central Strategic cost planning involves the consideration of various scenarios and determining which plans will attain the desired short-term and long-term goals and objectives. These must be monitored and controlled regularly for successful accomplishments by comparing and analyzing actual performance against the plans (Hussey and Ong 2012). It investigates the differences between the plan and the actual performance, namely, the performance gap. The cost analysis helps the organization determine its effectiveness and efficiency in implementing business strategies and decide whether corrective action is necessary. This includes assessing competitive and regulatory environment changes and considering new ideas, improvements, innovations, and opportunities that the enterprise can pursue. These Operational and Strategy reviews (Catucci, 2003; Balanced Scorecard Collaborative, 2006) help keep organizations on a strategic trajectory for breakthrough performance. The meetings’ frequency to assess the changes is influenced by how quickly new data are reported by the operational or strategic dashboards that are departmental, functional, or process-based. People who are experts and experienced in the issues are the key to solutions development. The review meetings aim to arrive at an informed decision to solve problems that have recently emerged and to learn from the amassed operational data.
- **Human Capitals Agility & Change Training & Development (HCAGTD) System** – A fundamental organization-aligned improvement is that the goals and objectives of critical human-based HCAGTD are aligned with business strategies (Shih and Chiang, 2005) to help the organization differentiate itself in the

marketplace and acquire uniqueness in both product and business processes and ultimately profitability (Santala and Parvinen, 2007). This underlies the fundamental that the human capital is an asset for the ‘profit through people to satisfy people the customer’ approach that helps organizations to achieve a competitive advantage and ultimately the financial perspectives through the customer decision making in favor of a particular product or service (Noe and Tews, 2012; Sum, 2011). The Human Capital should be trained & developed with an agile & change midset to execute the 90-day operational road map with guidelines, deal with unforeseen roadblocks, address deviation from the original plan with organizational change agility coming into play, and correct the course to stay on track. The key is the “organization & individual learning” from miscalculations or external forces that require a shift in the plan, and moving forward with contingency plans makes sense, highlighting the “readiness & change mindsets” requisites (Teay, 2022).

Conclusion

While organizational alignment is deemed critical to organizational performance and success, most studies have been researched based on the business organizations, with little research into the mechanism of organizational alignment that can be applied to HEI’s performance and functioning. This paper proposes a 5-Levels-ADA Framework to analyze-develop-align strategic and operational plans from the institution-colleges-programs levels based on the imperatives of avoiding the piecemeal development of action plans from accreditation comments to ensure the alignment of the ICP’s decisions and actions to accomplish and achieve the ICP’s mission, goals, and strategic objectives.

This framework provides a step-by-step cascading of the organizational purpose of VMGV to Strategic Objectives & Strategies by analyzing & determining the critical components of a strategically aligned organization. It starts with identifying the organization’s purpose of the VMGV, which calls for particular SMART Objectives and the needed organization’s capacity & capabilities to be developed or improved. Based on these capacities and capabilities required to execute the strategies, the organization’s resources, management systems & mechanisms are developed and aligned across the different levels of the organization. This methodology emphasizes the importance of the organization value chain comprising of the core & support processes utilized by the organization, infor, and human capital with the enabling systems & mechanisms accentuating the processes that create and delivers on value.

In summary, all the core & support processes with the enabling systems and mechanisms highlight the imperative of aligning the strategic & operation plans. In conclusion, the more aligned the units within and across the programs and colleges are with the institution’s VMGV & SMART Objectives through the aligned action plans of the programs & colleges, the more successful the institution is with all units moving in tandem towards the same strategic direction. This is the basis of the 5-Levels-ADA Framework to serve as the strategic alignment framework for HEI and any organization aiming for success and high performance.

Appendix 1 Theme Two Alignments of ICP through 5 Levels-ADA and Action Plans

Theme Two: Quality Assurance Mechanism Institutional, Colleges & Programs C & P Alignments			
Key Issues	Sub-Themes	Institutional Actions	Colleges & Programs Actions
1. The preparation of the strategic plan for the Quality Unit/Deanship of Development and Quality	T21 Quality Assurance Plan (QAP)	Comprehensive Institution QAP	C & P QAP
2. The preparation of the policy manual for faculty and all concerned stakeholders	T22 Internal Quality Assurance (IQA) and Performance Management System (PMS)	Institutional IQA System context & Content coverage, Criteria Development & Assessment; System Reviews; Performance Management System integrating QA-Planning-Information System	C & P IQA System context & Content coverage, Criteria Development & Assessment; System Reviews; Performance Management System integrating QA-Planning-Information System
3. The documentation of QA policies, procedures, and guidelines in coordination with all concerned stakeholders and the dissemination of the same at each level			
4. The periodic review of the QA processes & implementation			
5. The use of feedback/surveys from concerned stakeholders for program improvement	T23 Stakeholders' satisfaction & dissatisfaction (SSDMS)	Institutional Stakeholders' satisfaction & dissatisfaction Management System with standardized instruments & data analytics	C & P peruse standardized Stakeholders' satisfaction & dissatisfaction & data analytics system
6. The sharing of the relevant program statistics and the surveys' analytical reports with all concerned stakeholders	T24 Reviews, Evaluation & Assessment System (REAS)	Institutional Comprehensive Program Reviews, Evaluation & Assessment System guidelines, practices, policies & protocols	C & P peruse standardized Program Reviews System guidelines, practices, policies & protocols
7. An external program review by subject experts			
8. The analysis of the annual Course Specification Reports assessing the alignment and attainment of the CLOs following the PLOs	T25 Performance Metrics System (PMS)	Institutional Performance Metrics System developed aligning Planning & QA performance metrics & data analytics	C & P peruse standardized Performance Metrics System for Planning & QA data analytics & performance management
9. The use and review of KPIs for performance measures at each level			
10. The use of benchmarking with peer institutions to improve program quality			

Theme Two: Quality Assurance Mechanism Institutional, C & P Alignments				
Sub-Themes 2	Sub-Themes 2 PDCA (Plan, Do, Check & Act) Strategic Actions	Colleges & Programs Actions		
T21 Quality Assurance Plan (QAP)	Comprehensive Institution QAP Framework	P Institutional QAP Plan Development & Design	C & P QAPs guiding strategic & operational directions & actions of C & P	P C & P QAP Development & Design
		D Institutional QAP deployed across all units		D C & P QAP deployed across all units
		C Institutional QAP reviews for accomplishment		C C & P QAP reviews for accomplishment
		A Institutional QAP Action Plans remedies		A C & P QAP Action Plans remedies
T22 Internal Quality Assurance (IQA) and Performance Management System (PMS)	Institutional IQA System Criteria, Context & Content Development, Assessment & Reviews integrating QA-Planning-Information Systems Performance Management System (PMS)	P Institutional IQA System Development & Design	C & P IQA System context & Content coverage, Criteria Development & Assessment; System Reviews; Performance Management System integrating QA-Planning-Information System	P C & P IQA System Development & Design
		D Institutional IQA System deployed across all units		D C & P IQA System deployed across all units
		C Institutional IQA System reviews for accomplishment		C C & P IQA System reviews for accomplishment
		A Institutional IQA System Action Plans remedies		A C & P IQA System remedies
T23 Stakeholders' satisfaction & dissatisfaction (SSDMS)	Institutional (SSDMS) with standardized instruments & data analytics	P Institutional SSDMS Development & Design	C & P peruse standardized SSDMS for data analytics & informed decision making	P C & P SSDMS Development & Design
		D Institutional SSDMS deployed across all units		D C & P SSDMS deployed across all units
		C Institutional SSDMS reviews for accomplishment		C C & P SSDMS reviews for accomplishment
		A Institutional SSDMS Action Plans remedies		A C & P SSDMS Action Plans remedies
T24 Reviews, Evaluation & Assessment System (REAS)	Institutional Comprehensive Reviews, Evaluation & Assessment System (REAS) guidelines, practices, policies & protocols	P Institutional REAS Development & Design	C & P peruse standardized REAS guidelines, practices, policies & protocols for evaluations	P C & P REAS Development & Design
		D Institutional REAS deployed across all units		D C & P REAS deployed across all units
		C Institutional REAS reviews for accomplishment		C C & P REAS reviews for accomplishment
		A Institutional REAS Action Plans on remedies		A C & P REAS Action Plans remedies
T25 Performance Metrics System (PMS)	Institutional PMS developed aligning Planning & QA performance metrics & data analytics	P Institutional PMS Development & Design	C & P peruse standardized PMS for Planning & QA data analytics & performance management	P C & P PMS Development & Design
		D Institutional PMS deployed across all units		D C & P PMS deployed across all units
		C Institutional PMS reviews for accomplishment		C C & P PMS reviews for accomplishment
		A Institutional PMS Action n remedies		A C & P PMS Action Plans remedies

Theme Two: Quality Assurance Mechanism Institutional, Colleges & Programs (C & P) Alignment			
Sub-Themes 2	Institutional PDCA Strategic Actions	Colleges & Programs Actions	Analysis, Development & Alignment
T21 Quality Assurance Plan (QAP)	P Institutional QAP Development & Design	P C & P QAP Development & Design	Level 0: Development & Design of System & Mechanisms completed
	D Institutional QAP deployed across all units	D C & P QAP deployed across all units	
	C Institutional QAP reviews for accomplishment	C C & P QAP reviews for accomplishment	
	A Institutional QAP Action Plans remedies	A C & P QAP Action Plans acted on based on remedies	
T22 Internal Quality Assurance (IQA) and Performance Management System (PMS)	P Institutional IQA System Development & Design	P C & P IQA System Development & Design	Level 1: Deployment across all units completed and implemented
	D Institutional IQA System deployed across all units	D C & P IQA System deployed across all units	
	C Institutional IQA System reviews for accomplishment	C C & P IQA System reviews for accomplishment	
	A Institutional IQA System Action Plans remedies	A C & P IQA System acted on based on remedies	
T23 Stakeholders' satisfaction & dissatisfaction (SSDMS)	P Institutional SSDMS Development & Design	P C & P SSDMS Development & Design	Level 2: Reviews, Evaluation & Assessment of Implementation & Alignment resulting in informed decisions of performance
	D Institutional SSDMS deployed across all units	D C & P SSDMS deployed across all units	
	C Institutional SSDMS reviews for accomplishment	C C & P SSDMS reviews for accomplishment	
	A Institutional SSDMS Action Plans remedies	A C & P SSDMS Action Plans acted on based on remedies	
T24 Reviews, Evaluation & Assessment System (REAS)	P Institutional REAS Development & Design	P C & P REAS Development & Design	Level 3: Action Plans developed & executed to ensure "performance gaps" are addressed & closed
	D Institutional REAS deployed across all units	D C & P REAS deployed across all units	
	C Institutional REAS reviews for accomplishment	C C & P REAS reviews for accomplishment	
	A Institutional REAS Action Plans remedies	A C & P REAS Action Plans acted on based on remedies	
T25 Performance Metrics System (PMS)	P Institutional PMS Development & Design	P C & P PMS Development & Design	Level 4: Strategic, C & P Systems & Mechanisms reviewed holistically for accomplishment & alignments
	D Institutional PMS deployed across all units	D C & P PMS deployed across all units	
	C Institutional PMS reviews for accomplishment	C C & P PMS reviews for accomplishment	
	A Institutional PMS Action Plans remedies	A C & P PMS Action Plans acted on based on remedies	

Theme Two: Quality Assurance Mechanism Institutional, Colleges & Programs (C & P) Alignment			
Sub-Theme 2	Institutional PDCA Analysis & Development Actions		Colleges & Programs Analysis, Development & Alignment Actions
T21 Quality Assurance Plan (QAP)	P Institutional QAP Development & Design	Level 0: Development & Design of QAP System & Mechanisms completed	P C & P QAP Development & Design
	D Institutional QAP deployed across all units	Level 1: QAP System & Mechanisms Deployment across all units completed and implemented	D C & P QAP deployed across all units
	C Institutional QAP reviews for accomplishments	Level 2: QAP System & Mechanisms Reviews, Evaluation & Assessment of Implementation & Alignment resulting in informed decisions of performance	C C & P QAP reviews for accomplishments
	A Institutional QAP Action Plans remedies	Level 3: QAP System & Mechanisms Action Plans developed & executed to ensure "performance gaps" are addressed & closed Level 4: QAP System & Mechanisms reviewed holistically for accomplishments & alignments	A C & P QAP Action Plans remedies
T22 Internal Quality Assurance (IQA) and Performance Management System (PMS)	P Institutional IQA & PMS Development & Design	Level 0: Development & Design of IQA & PMS System & Mechanisms completed	P C & P IQA & PMS Development & Design
	D Institutional IQA & PMS deployed across all units	Level 1: IQA & PMS System & Mechanisms Deployment across all units completed and implemented	D C & P IQA & PMS deployed across all units
	C Institutional IQA & PMS reviews for accomplishment	Level 2: IQA & PMS System & Mechanisms Reviews, Evaluation & Assessment of Implementation & Alignment resulting in informed decisions of performance	C C & P IQA & PMS reviews for accomplishment
	A Institutional IQA & PMS Action Plans remedies	Level 3: IQA & PMS System & Mechanisms Action Plans developed & executed to ensure "performance gaps" are addressed & closed Level 4: IQA & PMS V System & Mechanisms reviewed holistically for accomplishments & alignments	A C & P IQA & PMS Action Plans remedies
T23 Stakeholders' satisfaction & dissatisfaction (SSDMS)	P Institutional SSDMS Development & Design	Level 0: Development & Design of SSDMS System & Mechanisms completed	P C & P SSDMS Development & Design
	D Institutional SSDMS deployed across all units	Level 1: SSDMS System & Mechanisms Deployment across all units completed and implemented	D C & P SSDMS deployed across all units
	C Institutional SSDMS reviews for accomplishment	Level 2: SSDMS System & Mechanisms Reviews, Evaluation & Assessment of Implementation & Alignment resulting in informed decisions of performance	C C & P SSDMS reviews for accomplishment
	A Institutional SSDMS Action Plans remedies	Level 3: SSDMS System & Mechanisms Action Plans developed & executed to ensure "performance gaps" are addressed & closed Level 4: SSDMS System & Mechanisms reviewed holistically for accomplishments & alignments	A C & P SSDMS Action Plans remedies
T24 Reviews, Evaluation & Assessment System (REAS)	P Institutional REAS development & Design	Level 0: Development & Design of REAS System & Mechanisms completed	P C & P REAS Development & Design
	D Institutional REAS deployed across all units	Level 1: REAS System & Mechanisms Deployment across all units completed and implemented	D C & P GABC deployed across all units
	C Institutional REAS reviews for accomplishment	Level 2: REAS System & Mechanisms Reviews, Evaluation & Assessment of Implementation & Alignment resulting in informed decisions of performance	C C & P REAS reviews for accomplishment
	A Institutional REAS Action Plans remedies	Level 3: REAS System & Mechanisms Action Plans developed & executed to ensure "performance gaps" are addressed & closed Level 4: REAS System & Mechanisms reviewed holistically for accomplishments & alignments	A C & P REAS Action Plans remedies
T25 Performance Metrics System (PMS)	P Institutional PMS Development & Design	Level 0: Development & Design of PMS System & Mechanisms completed	P C & P PMS Development & Design
	D Institutional PMS deployed across all units	Level 1: PMS System & Mechanisms Deployment across all units completed and implemented	D C & P PMS deployed across all units
	C Institutional PMS reviews for accomplishment	Level 2: PMS System & Mechanisms Reviews, Evaluation & Assessment of Implementation & Alignment resulting in informed decisions of performance	C C & P AS-TL reviews for accomplishment
	A Institutional PMS Action Plans remedies	Level 3: PMS System & Mechanisms Action Plans developed & executed to ensure "performance gaps" are addressed & closed Level 4: PMS System & Mechanisms reviewed holistically for accomplishments & alignments	A C & P PMS Action Plans remedies

Appendix 2 Theme Three Alignments of ICP through 5 Levels-ADA and Action Plans

Theme Three: Institutional, Colleges & Programs (C & P) Alignments of Effectiveness in Teaching and Learning			
Key Issues	Sub-Themes	Institutional Actions	Colleges & Programs Actions
1. Assuring the compliance of the curriculum with the NCAAA and NQF requirements	T31 Academic System meeting Governmental requirements (AS-GSA)	Institutional Academic System policies, protocols & practices meeting government agencies requirements	Colleges & Programs peruse standardized Institutional Academic System policies, protocols & practices meeting government agencies requirements
2. Specification Reports to measure the level of achievement in each course/program			
3. Training the faculty on writing PLOs, CLOs, course mapping, and teaching and assessment methodologies			
4. Implementing faculty course files			
5. Disseminating the CLOs to students and making program/course specifications available to each student on the website before the start of the program	T32 Academic System in Students' Outcomes (AS-SLO)	Institutional Academic System policies, protocols & practices on Student Learning Outcomes development, design & assessment & reviews	Colleges & Programs peruse standardized Institutional Academic System policies, protocols & practices on Student Learning Outcomes development, design & assessment & reviews
6. Periodically assessing the attainment of PLOs, CLOs, KPIs, & Course			
7. Revising CLOs, course mapping, and assessment methods to make them more effective and aligned			
8. Conducting annual internal course audits to monitor accuracy, compliance, and consistency			
9. Conducting a review of the existing examination system to make it more diverse Benchmarking the existing curriculum with national/international curriculum	T33 Academic System on academic assessment, benchmarking and reviews (AS-PMS)	Institutional Academic System policies, protocols & practices on academic performance assessment & benchmarking and reviews	Colleges & Programs peruse standardized Institutional Academic System policies, protocols & practices on academic performance assessment & benchmarking and reviews
10. Checking all students' assignments for plagiarism			
11. Hiring a more competent and PhD-qualified faculty with the appropriate gender balance			
12. Implementing a regular faculty development program and an orientation program for the new faculty			
13. Requiring internship/fieldwork for both male and female students in courses where it is required	T34 Academic System on Faculty Management (AS-FM)	Institutional Academic System policies, protocols & practices on Faculty Management	Colleges & Programs peruse standardized Institutional Academic System policies, protocols & practices on Faculty Management
14. Risk management and proper safety measures and training for the students, faculty, and supervisors in fieldwork			
15. Periodically reviewing the program statistics to measure the batch-wise retention and progression rate	T35 Academic System on Student Internship & Fieldwork (AS-SIF)	Institutional Academic System policies, protocols & practices on Student Internship & Fieldwork	Colleges & Programs peruse standardized Institutional Academic System policies, protocols & practices on Student Internship & Fieldwork
16. Maintaining the alumni and employer database for external program evaluation			
	T36 Academic System on Academic Performance Metrics (AS-PMS)	Institutional Academic System policies, protocols & practices on Academic Performance Metrics	Colleges & Programs peruse standardized Institutional Academic System policies, protocols & practices on Academic Performance Metrics

Theme Three: Institutional, Colleges & Programs (C & P) Alignments of Effectiveness in Teaching and Learning				
Sub-Themes 3	Sub-Themes 3 PDCA (Plan, Do, Check & Act) Strategic Actions			Colleges & Programs Actions
T31 Academic System meeting Governmental requirements (AS-GSA)	Institutional Academic System policies, protocols & practices meeting government agencies requirements	P Institutional AS-GSA Development & Design	C & P peruse standardized Institutional Academic System policies, protocols & practices meeting government agencies requirements	P C & P AS-GSA Development & Design
		D Institutional AS-GSA deployed across all units		
		C Institutional AS-GSA reviews for accomplishment		
		A Institutional AS-GSA Action Plans remedies		
T32 Academic System in Students' Outcomes (AS-SLO)	Institutional Academic System policies, protocols & practices on Student Learning Outcomes development, design & assessment & reviews	P Institutional AS-SLO Development & Design	C & P peruse standardized Institutional Academic System policies, protocols & practices on Student Learning Outcomes development, design & assessment & reviews	P C & P AS-SLO Development & Design
		D Institutional AS-SLO deployed across all units		
		C Institutional AS-SLO reviews for accomplishment		
		A Institutional AS-SLO Action Plans remedies		
T33 Academic System on academic assessment, benchmarking and reviews (AS-PMS)	Institutional Academic System policies, protocols & practices on academic performance assessment, benchmarking & reviews	P Institutional AS-PMS Development & Design	C & P peruse standardized Institutional Academic System policies, protocols & practices on academic performance assessment & benchmarking and reviews	P C & P AS-PMS development & Design
		D Institutional AS-PMS deployed across all units		
		C Institutional AS-PMS reviews for accomplishment		
		A Institutional AS-PMS Action Plans remedies		
T34 Academic System on Faculty Management (AS-FM)	Institutional Academic System policies, protocols & practices on Faculty Management	P Institutional AS-FM Development & Design	C & P peruse standardized Institutional Academic System policies, protocols & practices on Faculty Management	P C & P AS-FM Development & Design
		D Institutional AS-FM deployed across all units		
		C Institutional AS-FM reviews for accomplishment		
		A Institutional AS-FM Action Plans remedies		
T35 Academic System on Student Internship & Fieldwork (AS-SIF)	Institutional Academic System policies, protocols & practices on Student Internship & Fieldwork	P Institutional AS-SIF Development & Design	C & P peruse standardized Institutional Academic System policies, protocols & practices on Student Internship & Fieldwork	P C & P AS-SIF development & Design
		D Institutional AS-SIF deployed across all units		
		C Institutional AS-SIF reviews for accomplishment		
		A Institutional AS-SIF Action Plans remedies		
T36 Academic System on Academic Performance Metrics (AS-PMS)	Institutional Academic System policies, protocols & practices on Academic Performance Metrics	P Institutional AS-PMS Development & Design	C & P peruse standardized Institutional Academic System policies, protocols & practices on Academic Performance Metrics	P C & P AS-PMS Development & Design
		D Institutional AS-PMS deployed across all units		
		C Institutional AS-PMS reviews for accomplishment		
		A Institutional AS-PMS Action Plans remedies		

Theme Three: Institutional, Colleges & Programs (C & P) Alignments of Effectiveness in Teaching and Learning			
Sub-Themes 3	Institutional PDCA Strategic Actions	Colleges & Programs Actions	Theme Analysis & Alignment
T31 Academic System meeting Governmental requirements (AS-GSA)	P Institutional AS-GSA Development & Design	P C & P AS-GSA Development & Design	Level 0: Development & Design of System & Mechanisms completed
	D Institutional AS-GSA deployed across all units		
	C Institutional AS-GSA reviews for accomplishment		
	A Institutional AS-GSA Action Plans remedies		
T32 Academic System in Students' Outcomes (AS-SLO)	P Institutional AS-SLO Development & Design	P C & P AS-SLO Development & Design	Level 1: Deployment across all units completed and implemented
	D Institutional AS-SLO deployed across all units		
	C Institutional AS-SLO reviews for accomplishment		
	A Institutional AS-SLO Action Plans remedies		
T33 Academic System on academic assessment, benchmarking and reviews (AS-PMS)	P Institutional AS-PMS Development & Design	P C & P AS-PMS development & Design	Level 2: Reviews, Evaluation & Assessment of Implementation & Alignment resulting in informed decisions of performance
	D Institutional AS-PMS deployed across all units		
	C Institutional AS-PMS reviews for accomplishment		
	A Institutional AS-PMS Action Plans remedies		
T34 Academic System on Faculty Management (AS-FM)	P Institutional AS-FM Development & Design	P C & P AS-FM Development & Design	Level 3: Action Plans developed & executed to ensure "performance gaps" are addressed & closed
	D Institutional AS-FM deployed across all units		
	C Institutional AS-FM reviews for accomplishment		
	A Institutional AS-FM Action Plans remedies		
T35 Academic System on Student Internship & Fieldwork (AS-SIF)	P Institutional AS-SIF Development & Design	P C & P AS-SIF development & Design	Level 4: Strategic, C & P Systems & Mechanisms reviewed holistically for accomplishment & alignments
	D Institutional AS-SIF deployed across all units		
	C Institutional AS-SIF reviews for accomplishment		
	A Institutional AS-SIF Action Plans remedies		
T36 Academic System on Academic Performance Metrics (AS-PMS)	P Institutional AS-PMS Development & Design	P C & P AS-PMS Development & Design	Level 4: Strategic, C & P Systems & Mechanisms reviewed holistically for accomplishment & alignments
	D Institutional AS-PMS deployed across all units		
	C Institutional AS-PMS reviews for accomplishment		
	A Institutional AS-PMS Action Plans remedies		

Theme Three: Institutional, Colleges & Programs (C & P) Alignments of Effectiveness in Teaching and Learning				
Sub-Theme 3	Institutional PDCA Analysis & Development Actions		Colleges & Programs Analysis, Development & Alignment Actions	
T31 Academic System meeting Governmental requirements (AS-GSA)	P Institutional AS-GSA Development & Design	Level 0: Development & Design of AS-GSA System & Mechanisms completed	P C & P AS-GSA Development & Design	Level 0: C & P AS-GSA Development & Design aligned with Institution QAP
	D Institutional AS-GSA deployed across all units	Level 1: AS-GSA System & Mechanisms Deployment across all units completed and implemented	D C & P AS-GSA deployed across all units	Level 1: <i>Collegial</i> AS-GSA deployed to Programs for <i>Programmatic</i> AS-GSA Development & Design alignment
	C Institutional AS-GSA reviews for accomplishment	Level 2: AS-GSA System & Mechanisms Reviews, Evaluation & Assessment of Implementation & Alignment resulting in informed decisions of performance	C C & P AS-GSA reviews for accomplishment	Level 2: C & P Reviews, Evaluate & Assess of Implementation & Alignment resulting in informed decisions of performance of AS-GSA System & Mechanisms
	A Institutional AS-GSA Action Plans remedies	Level 3: AS-GSA System & Mechanisms Action Plans developed & executed to ensure "performance gaps" are addressed & closed	A C & P AS-GSA Action Plans remedies	Level 3: C & P Action Plans developed & executed to ensure "performance gaps" are addressed & closed of AS-GSA System & Mechanisms
		Level 4: AS-GSA System & Mechanisms reviewed holistically for accomplishments & alignments		Level 4: C & P AS-GSA System & Mechanisms reviewed holistically for accomplishments & alignments
T32 Academic System in Students' Outcomes (AS-SLO)	P Institutional AS-SLO Development & Design	Level 0: Development & Design of AS-SLO System & Mechanisms completed	P C & P AS-SLO Development & Design	Level 0: C & P AS-SLO Development & Design aligned with Institution IQA & PMS
	D Institutional AS-SLO deployed across all units	Level 1: AS-SLO System & Mechanisms Deployment across all units completed and implemented	D C & P AS-SLO deployed across all units	Level 1: <i>Collegial</i> AS-SLO deployed to Programs for <i>Programmatic</i> IQA & PMS Development & Design alignment
	C Institutional AS-SLO reviews for accomplishment	Level 2: AS-SLO System & Mechanisms Reviews, Evaluation & Assessment of Implementation & Alignment resulting in informed decisions of performance	C C & P AS-SLO reviews for accomplishment	Level 2: C & P Reviews, Evaluate & Assess of Implementation & Alignment resulting in informed decisions of performance of AS-SLO System & Mechanisms
	A Institutional AS-SLO Action Plans remedies	Level 3: AS-SLO System & Mechanisms Action Plans developed & executed to ensure "performance gaps" are addressed & closed	A C & P AS-SLO Action Plans remedies	Level 3: C & P Action Plans developed & executed to ensure "performance gaps" are addressed & closed of AS-SLO System & Mechanisms
		Level 4: AS-SLO System & Mechanisms reviewed holistically for accomplishments & alignments		Level 4: C & P AS-SLO System & Mechanisms reviewed holistically for accomplishments & alignments
T33 Academic System on academic assessment, benchmarking and reviews (AS-PMS)	P Institutional AS-PMS Development & Design	Level 0: Development & Design of AS-PMS System & Mechanisms completed	P C & P AS-PMS development & Design	Level 0: C & P AS-PMS Development & Design aligned with Institution VMGV
	D Institutional AS-PMS deployed across all units	Level 1: AS-PMS System & Mechanisms Deployment across all units completed and implemented	D C & P AS-PMS deployed across all units	Level 1: <i>Collegial</i> AS-PMS deployed to Programs for <i>Programmatic</i> PMS Development & Design alignment
	C Institutional AS-PMS reviews for accomplishment	Level 2: AS-PMS System & Mechanisms Reviews, Evaluation & Assessment of Implementation & Alignment resulting in informed decisions of performance	C C & P AS-PMS reviews for accomplishment	Level 2: C & P Reviews, Evaluate & Assess of Implementation & Alignment resulting in informed decisions of performance of AS-PMS System & Mechanisms
	A Institutional AS-PMS Action Plans remedies	Level 3: AS-PMS System & Mechanisms Action Plans developed & executed to ensure "performance gaps" are addressed & closed	A C & P AS-PMS Action Plans remedies	Level 3: C & P Action Plans developed & executed to ensure "performance gaps" are addressed & closed of AS-PMS System & Mechanisms
		Level 4: AS-PMS System & Mechanisms reviewed holistically for accomplishments & alignments		Level 4: C & P AS-PMS System & Mechanisms reviewed holistically for accomplishments & alignments
T34 Academic System on Faculty Management (AS-FM)	P Institutional AS-FM Development & Design	Level 0: Development & Design of AS-FM System & Mechanisms completed	P C & P AS-FM Development & Design	Level 0: C & P AS-FM Development & Design aligned with Institution AS-FM
	D Institutional AS-FM deployed across all units	Level 1: AS-FM System & Mechanisms Deployment across all units completed and implemented	D C & P AS-FM deployed across all units	Level 1: <i>Collegial</i> AS-FM deployed to Programs for <i>Programmatic</i> REAS Development & Design alignment
	C Institutional AS-FM reviews for accomplishment	Level 2: AS-FM System & Mechanisms Reviews, Evaluation & Assessment of Implementation & Alignment resulting in informed decisions of performance	C C & P AS-FM reviews for accomplishment	Level 2: C & P Reviews, Evaluate & Assess of Implementation & Alignment resulting in informed decisions of performance of AS-FM System & Mechanisms
	A Institutional AS-FM Action Plans remedies	Level 3: AS-FM System & Mechanisms Action Plans developed & executed to ensure "performance gaps" are addressed & closed	A C & P AS-FM Action Plans remedies	Level 3: C & P Action Plans developed & executed to ensure "performance gaps" are addressed & closed of AS-FM System & Mechanisms
		Level 4: AS-FM System & Mechanisms reviewed holistically for accomplishments & alignments		Level 4: C & P AS-FM System & Mechanisms reviewed holistically for accomplishments & alignments
T35 Academic System on Student Internship & Fieldwork (AS-SIF)	P Institutional AS-SIF Development & Design	Level 0: Development & Design of AS-SIF System & Mechanisms completed	P C & P AS-SIF development & Design	Level 0: C & P AS-SIF Development & Design aligned with Institution PMS
	D Institutional AS-SIF deployed across all units	Level 1: AS-SIF System & Mechanisms Deployment across all units completed and implemented	D C & P AS-SIF deployed across all units	Level 1: <i>Collegial</i> AS-SIF deployed to Programs for <i>Programmatic</i> PMS Development & Design alignment
	C Institutional AS-SIF reviews for accomplishment	Level 2: AS-SIF System & Mechanisms Reviews, Evaluation & Assessment of Implementation & Alignment resulting in informed decisions of performance	C C & P AS-SIF reviews for accomplishment	Level 2: C & P Reviews, Evaluate & Assess of Implementation & Alignment resulting in informed decisions of performance of AS-SIF System & Mechanisms
	A Institutional AS-SIF Action Plans remedies	Level 3: AS-SIF System & Mechanisms Action Plans developed & executed to ensure "performance gaps" are addressed & closed	A C & P AS-SIF Action Plans remedies	Level 3: C & P Action Plans developed & executed to ensure "performance gaps" are addressed & closed of AS-SIF System & Mechanisms
		Level 4: AS-SIF System & Mechanisms reviewed holistically for accomplishments & alignments		Level 4: C & P AS-SIF System & Mechanisms reviewed holistically for accomplishments & alignments
T36 Academic System on Academic Performance Metrics (AS-PMS)	P Institutional AS-PMS Development & Design	Level 0: Development & Design of A AS-PMS System & Mechanisms completed	P C & P AS-PMS Development & Design	Level 0: C & P AS-PMS Development & Design aligned with Institution PMS
	D Institutional AS-PMS deployed across all units	Level 1: AS-PMS System & Mechanisms Deployment across all units completed and implemented	D C & P AS-PMS deployed across all units	Level 1: <i>Collegial</i> AS-PMS deployed to Programs for <i>Programmatic</i> PMS Development & Design alignment
	C Institutional AS-PMS reviews for accomplishment	Level 2: AS-PMS System & Mechanisms Reviews, Evaluation & Assessment of Implementation & Alignment resulting in informed decisions of performance	C C & P AS-PMS reviews for accomplishment	Level 2: C & P Reviews, Evaluate & Assess of Implementation & Alignment resulting in informed decisions of performance of AS-PMS System & Mechanisms
	A Institutional AS-PMS Action Plans remedies	Level 3: AS-PMS System & Mechanisms Action Plans developed & executed to ensure "performance gaps" are addressed & closed	A C & P AS-PMS Action Plans remedies	Level 3: C & P Action Plans developed & executed to ensure "performance gaps" are addressed & closed of AS-PMS System & Mechanisms
		Level 4: AS-PMS System & Mechanisms reviewed holistically for accomplishments & alignments		Level 4: C & P AS-PMS System & Mechanisms reviewed holistically for accomplishments & alignments

References

- Armistead C., Pritchard J. & Machin S., (1999). Strategic Business Process Management for Organizational Effectiveness. *Long Range Planning*, Vol. 32, No 1, 96 -106
- Assur, N., & Rowshankish, K. (2022). The data-driven enterprise of 2025. *McKinsey Digital*. McKinsey Global Publishing
- Baets, W. (1996). Some empirical evidence on IS strategy alignment in banking. *Information and Management*, 30 (4), 155-177.
- Balanced Scorecard Collaborative. (2006). Conducting Strategy Reviews. Office of Strategy Management Working Group workshop, Balanced Scorecard Collaborative, March 28, 2006.
- Beer, M., Voelpel, S., Leibold, M. & Tekie, E. (2005). Strategic Management as Organizational Learning: Developing Fit and Alignment through a Disciplined Process, *Long Range Planning*, 38(1), 445-465.
- Boudreau, M-C., & Watson, R. (2006). Internet advertising strategy alignment. *Internet Research*, 16 (1), 23-37.
- Bourgeois, L. (1980). Strategy and environment: a conceptual integration. *Academy of Management Review*, 5(1), 25-39.
- Bradach, J. (1996). Organizational Alignment: The 7 S-Model, Harvard Business Review, November 1996
- Broadbent, M., & Weill, P. (1993). Improving business and information strategy alignment: learning from the banking industry. *IBM Systems Journal*, 32 (1), 162-179.
- Brown, S., Gandhi, D., Herring, L., & Puri, A. (2019). The analytics academy: Bridging the gap between human and artificial intelligence. *McKinsey Quarterly*, September 25, 2019.
- Cato, S. T., & Gordon, J. (2009). Relationship of the strategic vision alignment to employee productivity and student enrolment. *Research in Higher Education Journal*, 7, 1-20.
- Cameron, K. S., Dutton, J. E., & Quinn, R. E. (Eds.). (2003). *Positive organizational scholarship: Foundations of a new discipline*. San Francisco: Berrett-Koehler.
- Campbell, D. (2006). Choose the Right Measures, Drive the Right Strategy. *Balanced Scorecard Report*, May-June 2006: 3-5.
- Catucci, W. (2003). Making Strategy Execution a Core Competence. Balanced Scorecard Collaborative Conference, Bal Harbour, FL, December 2003.
- Cravens, K. S., Oliver, E. Goad., & Stewart, J. S. (2010). Can a positive approach to performance evaluation help accomplish your goals? *Business Horizons* 53, 269-279
- Daft, R., Sormunen, L., & Parks, D. (1988). Chief executive scanning, environmental characteristics, and company performance: an empirical study. *Strategic Management Journal*, 9(2), 123-139
- Dewar, C., Keller, S., & Vikram M., (2022). CEO Excellence: The six mindsets that distinguish the best leaders from the rest. Scribner. 2022. ISBN-13: 978-1982179670. <https://www.simonandschusterpublishing.com/scribner/>

- Eckerson, W. W. (2006). *Performance Dashboards: Measuring, Monitoring, and Managing Your Business*. Hoboken, NJ: John Wiley & Sons
- Epstein, M. J., & Roy, M. (2002). *Measuring and Improving the Performance of Corporate Boards*, Management Accounting Guidelines, Society of Management Accountants of Canada, Mississauga, Ontario, 2002.
- Fitz-enz, J. (2000). *The ROI of Human Capital: Measuring the Economic Value of Employee Performance*. AMACOM, 2000. New York, NY.
- Fonvielle, W., & Carr, L. (2001). Gaining Strategic Alignment: Making Scorecards work, *Management Accounting Quarterly*, 3(1), 4-14.
- Frangos, C. (2002). Aligning Human Capital with Business Strategy: Perspective from Thought Leaders. Balanced Scorecard. Harvard Business School Publishing, Boston, Massachusetts 02163.
- Fredrickson, B., & Losada, M. F. (2005). Positive affect and the complex dynamics of human flourishing. *American Psychologist*, 60(7), 678-686.
- Garvin, D. A. (2000). *Learning in Action: A Guide to Putting the Learning Organization to Work*. (Boston: Harvard Business School Press, Boston, Massachusetts 02163
- Goold, M., Campbell, A., & Alexander, M. (1994). *Corporate-Level Strategy: Creating Value in the Multibusiness Company*. New York: John Wiley & Sons,
- Hambrick, D. (1982). Environmental Scanning and Organisational strategy. *Strategic Management Journal*, 3(2), 159-174.
- Harreld, J. B., O'Reilly III, C. A., & Tushman M. L. (2007). Dynamic Capabilities at IBM: Driving Strategy into Action, *California Management Review*, 49(4)
- Harreld, J.B. (2014). Executing Strategy. Strategy Core Curriculum, Harvard Business School Publishing, Boston, Massachusetts 02163. www.harvardbusiness.org/press
- Henderson, J., & Thomas, J. (1992) Aligning business and information technology domains: Strategic planning in hospitals. *Hospital and Health Services Administrative*, 37, 1, 71-87.
- Henderson, J., & Venkatraman, N. (1990) *Strategic alignment: A model for organization transformation via information technology*. Working Paper 3223-90, Sloan School of Management, Massachusetts Institute of Technology.
- Ho, C. F. (1996). Information technology implantation strategies for manufacturing organizations: A strategic alignment approach. *International Journal of Operations and Production Management*, 16 (7), 77-100.
- Hough, J., & Liebig, K. (2013). An Analysis of Strategic Alignment Tools. *Corporate Ownership & Control*. 10, (2), 591-603
- Hussey, R., & Ong, A. (2012). Monitoring and Control, *Strategic Cost Analysis*. Harvard Business Publishing. <http://www.hbsp.harvard.edu>.
- Hussey, R., & Ong, A. (2012). Establishing Plans, *Strategic Cost Analysis*. Harvard Business Publishing. <http://www.hbsp.harvard.edu>.
- Jennings, D., and Lumpkin, J. (1992). Insights between environmental scanning activities and porter's generic strategies: an empirical analysis. *Journal of Management*, 18 (4), 791-803.

- Kaplan R. S., & Norton, D. P. (2006). Cascading: The Process. *Alignment: Using the Balanced Scorecard to Create Corporate Synergies*. Harvard Business School Publishing, Boston, Massachusetts 02163. www.harvardbusiness.org/press
- Kaplan R. S., & Norton, D. P. (2006). Aligning Boards and Investors. *Alignment: Using the Balanced Scorecard to Create Corporate Synergies*. Harvard Business School Publishing, Boston, Massachusetts 02163. www.harvardbusiness.org/press
- Kaplan R. S., & Norton, D. P. (2006). The Strategy Map as a Visual Representation of Organizational Strategy. *Strategy Maps: Converting Intangible Assets into Tangible Outcomes*. Harvard Business School Publishing, Boston, Massachusetts 02163. www.harvardbusiness.org/press
- Kaplan, R. S., & Norton, D. P. (2006). Structure and Strategy, *The Balanced Scorecard: Translating Strategy into Action*. Harvard Business School Publishing, Boston, Massachusetts 02163. www.harvardbusiness.org/press
- Kaplan, R. S., & Norton, D. P. (2008). Plan Operations Align Process Improvement Programs. *The Execution Premium: Linking Strategy to Operations for Competitive Advantage*. Harvard Business School Publishing, Boston, Massachusetts 02163. www.harvardbusiness.org/press
- Kaplan, R. S., & Norton, D. P. (2008). Operational and Strategy Review Meeting: Keeping the Organization on a Strategic Trajectory for Breakthrough Performance. *The Execution Premium: Linking Strategy to Operations for Competitive Advantage*. Harvard Business School Publishing, Boston, Massachusetts 02163. www.harvardbusiness.org/press
- Kettinger W. J., & Teng J. T. C. (1998). Aligning BPR to Strategy: a Framework for Analysis. *Long Range Planning*, Vol. 31, Issue 1, 93-107
- Khadem, R., & Khaddar, L. (2008). *Total alignment: Integrating vision, strategy, and execution for organizational success*. Atlanta, GA: Infotrac.
- Knudsen, D. (2003). Aligning corporate strategy, procurement strategy, and e-procurement tools. *International Journal of Physical Distribution and Logistics Management*, 33 (8), 720-734.
- Labovitz, G., & Rosanky, V. (1997). *The power of alignment: How great companies centered and accomplished extraordinary things*. New York, NY: John Wiley and Sons.
- Lawler, E. E. (1993). Board Governance and Accountability. *Balanced Scorecard Report*. January–February 1993
- Lorence, M. J. (2010). Using Dashboards to Revolutionize Your Performance Management System, Part 2: Implementation. *Balanced Scorecard Report*, The Strategy Execution Source. Harvard Business Review. 12(2)
- LSA Global. (2021). <https://lsaglobal.com/insights/proprietary-methodology/lsa-3x-organizational-alignment-model/>
- Luftman, J. N., Lewis, P. R. & Oldach, S. H. (1993). Transforming the enterprise: The alignment of business and information technology strategies, *IBM Systems Journal*, 32(1), 198-221
- MacDonald, H. (1991). Business strategy development, alignment, and redesign. In Michael S. Scott Morton (ed), *The Corporation of the 1990s: Information Technology and Organizational Transformation*, New York: Oxford University Press.
- Martin, R. L. (2010). The Execution Trap. *Harvard Business Review* 88, (7/8). July–August 2010, 64–71.

- Miles, R. & Snow, C. (1978). *Organizational Strategies, Structure, And Process*. New York: McGraw-Hill.
- Nadler, D. & Tushman, M., (1992). Designing Organizations That Have Good Fit. in *Organizational Architecture*, edited by D. Nadler, San Francisco: Jossey-Bass, 1992.
- Neilson, G. L., Martin, K. L. & Powers, E. (2008). The Secrets to Successful Strategy Execution, *Harvard Business Review* 86(6), June 2008: 60-70
- Noe, R. A., & Tews, M. J. (2012). Realigning Training and Development Research to Contribute to the Psychology of Competitive Advantage. *Industrial and Organizational Psychology*, 5: 101-104.
- Norman, R. (2002). Managing through Measurement or Meaning? Lessons from Experience with New Zealand's Public Sector Performance Management Systems. *International Review of Administrative Science*. 68(4), 619-628
- Papp, R. (2001). Introduction to Strategic Alignment. *Strategic Information Technology: Opportunities for Competitive Advantage*. DOI: 10.4018/978-1-878289-87-2.ch00
- Parker, M., Benson, R., & Trainor, E., (1988). *Information Economics: Linking Business Performance to Information Technology*, Prentice-Hall.
- Powell, P. (1993). Causality in the alignment of information technology and business strategy. *Journal of Strategic Information Systems*, 2(4), 330-324.
- Rappaport, A. (1997) *Creating Shareholder Value: A Guide for Managers and Investors*. New York: Free Press, 1997.
- Ryba, K. (2021). How to Align Individual, Team, and Organizational Goals for Success. <https://www.quantumworkplace.com/future-of-work/how-to-align-organizational-goals>
- Santala, M. and Parvinen, P., (2007). From Strategic Fit to Customer Fit, *Management Decision*, 45(1), 582-601
- Shih, H. A. & Chiang, Y. H. (2005). Strategy alignment between HRM, KM, and corporate development. *International Journal of Manpower*, 26(6), 582-603.
- Sledgianowski, D. & Luftman, J. (2005). IT-Business strategic alignment Maturity: A case study. *Journal of Cases on Information Technology*, 7 (2), 102-120.
- Simons, R. (2000). *Performance measurement and control systems for implementing strategy*. Upper Saddle River, NJ: Prentice-Hall.
- Sinclair, D. & Zairi, M. (1995). Effective process management through performance measurement: Part III-an integrated model of total quality-based performance measurement, *Business Process Re-engineering & Management Journal*, 1(3), 50-65. <https://doi.org/10.1108/14637159510103220>
- Stewart, G.B. (1991). *The Quest for Value*. New York: Harper Business, 1991
- Sull, DN (2007). Closing the Gap Between Strategy and Execution. *M.I.T. Sloan Management Review* 48(4), 30-38.
- Sum, V. (2011). Integrating training in business strategies means greater impact of training on the firm's competitiveness, *Research in Business and Economics Journal*, Vol 4, 1-19

Teay S. (2022). Leadership for Organization Performance: Organization, Infor & Human Capitals Troika Requisites. *Key Factors and Use Cases of Servant Leadership Driving Organizational Performance*, Edited by Maria Pressentin, I.G.I. Global 2022.

Teay S. (2021). Implementation Imperilment and Imperatives of Integrated eIQA of HEI, *Handbook of Research on Modern Educational Technologies, Applications, and Management* Edited by Mehdi Khosrow-Pour DBA, pp 139 – 159, <https://orcid.org/0000-0001-6760-0930>.

Teay S. (2021) Integrated Electronic HEI. Performance Management, *Encyclopedia of Organizational Knowledge, Administration, and Technology*, Edited by Mehdi Khosrow-Pour DBA, pp 1108 – 1131, <https://orcid.org/0000-0001-6760-0930>.

Teay S. & Wattanasap, S. (2019). Data Analytics: Planning and Quality Management Dimensional alignment in HEI, 19th SEAAIR Conference, September 25 - 27, 2019, Taiwan.

Teay S. (2017). An Integrated Electronic IQA System For HEI. *Encyclopedia of Information Science and Technology*, Mehdi Khosrow-Pour (Eds.) 4th edition published by IGI Global, International Publisher of Progressive Information Science and Technology, July 2017.

Trevor, J., &Varcoe. B., (2017). How Aligned Is Your Organization? Harvard Business Review, February 2017, <https://hbr.org/2017/02/how-aligned-is-your-organization>

Trkman P. (2010). The critical success factors of business process management. *International Journal of Information Management*, Vol.30, 125–134

Tushman M. L. & O'Reilly III, C. A. (2002). *Winning Through Innovation*. Harvard Business Review Press, Boston, MA, 29.

Venkatraman, N. (1989). The concept of fit in strategy research: Toward verbal and statistical correspondence. *Academy of Management Review*, 14 (3), July 1989, 423-444.

Waldersee, R. (1999). The Art of Service v. the Science of Measurement: Measuring and Managing Service Delivery. *Australian Journal of Public Administration*. 58(3). 38-42.

Wang, H.L. (2004). Strategic thinking in B2B e-commerce: The role of intra-organizational units of analysis. *Proceedings of the 2004 Australia and New Zealand Academy of Management Conference, Dunedin*, New Zealand, December 2004.

Waterman, R., Peters, T. J., and Phillips. JR (1980). Structure is not organization *Business Horizons*, 1980, vol. 23, issue 3, 14-26

Zott, C. and Amit, R. (2006). Exploring the Fit Between Business Strategy and Business Model: Implications for Firm Performance. A working paper in the INSEAD, Paris

TASK-BASED LANGUAGE TEACHING INVOLVING AUTHENTIC SITUATIONS AT A MALAYSIAN INSTITUTION OF HIGHER LEARNING

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ABSTRACT

In Malaysia, many non-native Mandarin learners lack confidence when communicating with native Mandarin speakers, despite completing a Mandarin as a Foreign Language course at the university. To overcome this predicament, non-native Mandarin learners need to see a concrete connection between the classroom language and authentic situations where the role of the instructor is seen as pivotal in the effective outcome of the process and endeavor. With this percept in mind, this study was designed as a task-based language teaching (TBLT) activity, in which 75 non-native Mandarin learners at a Malaysian institution of higher learning stepped out of the classroom to engage in simple communication tasks with native Mandarin speakers. Through questionnaire survey and introspection records, this study analyses and identifies the situation and problems non-native Mandarin learners face when communicating with native Mandarin speakers, including psychological barriers and operational difficulties when engaging in authentic situations. The paper also explores the influence and effect of task-based language teaching on learners' communication readiness and anxiety. The study found that in this framework, learners began to realize the importance of language practice, experienced reduced communicative anxiety, and increased confidence; thus TBLT proves to be a viable avenue for learning a foreign language at the university, where the seed of interaction with the Chinese society is sowed for successful germination through authentic learning contexts.

Keywords: TBLT; Mandarin; authentic situations, communication anxiety; communication readiness

Introduction

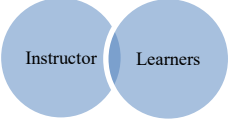
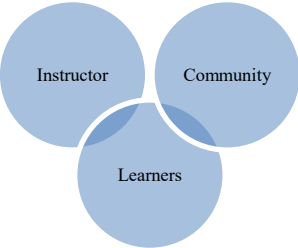
Among the many foreign languages offered by institutions of higher learning in Malaysia, many tertiary students opt to learn Mandarin not only because of its commercial value and wide practicality but also due to its influence in improving learning ability and lending added value in a job hunt (See & Ching, 2018). Therefore, using Mandarin to communicate in authentic situations should be the main goal of non-native Mandarin learners at the university. However, despite learning conversational forms of Mandarin, many learners continue to lack the confidence to communicate with native Mandarin speakers (Lew & Kaur, 2021).

Most effectively, learners need to use the language in the target language environment and culture (Lew et al., 2021). Listening and speaking skills can only be practiced in authentic situations to achieve commendable progress. It is important to note that language learning does not occur in the minds of learners in an isolated or detached process (Kaur, 2017). Instead, it is intertwined with the social context or milieu with which the learner operates and communicates with. However, what generally bothers Mandarin learners is that the activities of the course, such as simulation, listening test, writing test, and role-play, are all completed in the classroom, in simulated or contrived situations, where the opportunity to communicate with native speakers (the Chinese community) is starkly absent. Outside the classroom, they simply lack the will to experiment with the language and communicate with native Mandarin speakers.

Learners at institutions of higher learning should be more independent learners than middle school students. They need to embrace the concept of self-regulated learning (Van Eekelen et al., 2005) and master lifelong learning skills to become independent learners. However, Malaysian second or third language learners seem unable to apply what they have learned in the classroom (Kaur, 2013; Yong et al., 2016). It is a common phenomenon in Malaysian higher education where learners who have completed introductory Mandarin courses at university can barely communicate in the target language in their daily life, not even for rudimentary purposes. Lackluster contact hours of language classes and limited naturalistic environment suggest their inability to convey intended meaning or communicate in complete sentences (Yong et al., 2016). Most think that Mandarin-speaking skills are difficult to acquire (See & Ching, 2013), resulting in communication apprehension about Mandarin. Just as how Malaysian learners negatively perceive English (see Arulchelvan & Yunus, 2020; Kaur, 2017; Kaur, 2013), learning Mandarin is likewise perceived to be an academic subject whose importance is not placed on the purpose of real communication. This prevailing learning phenomenon is quite unhealthy as a lack of real-life situations reduces learners' performance and motivation to learn (Lan & Lin, 2016). Some learners may even perceive themselves in perpetual practice mode, not transcending to real meaning-making (Whitehead, 2021). Most learners learn in a non-target language environment. They are unfamiliar with the target language and have few opportunities to interact with native Mandarin speakers, resulting in communication apprehension. A previous study has shown that non-native Mandarin learners experience a certain degree of Mandarin-speaking anxiety, especially in situations that require them to speak spontaneously (Ting & Rijeng,

2018). Another study, however, found that using tasks could reduce learner anxiety to some degree and build confidence in the learning process (Bao & Du, 2015). As such, design tasks for learners cannot be confined to the classroom but need to involve tasks outside the classroom, involving authentic situations. In encouraging learners to improve Mandarin communication, establishing a firm connection between language learned in the classroom with authentic situations outside the classroom is the key, and instructors play an important role in this initiative. Table 1 compares TBLT between in-class and in authentic situations.

Table 1: TBLT Comparison of In-Class and Authentic Situations

	In class	Inauthentic situations
Aim	Promotes language learning	
Standard	The instructor needs to define the criteria for evaluating tasks clearly	
Method	Use the target language to communicate, focusing on the meaning of language, not form	
Evaluation	The instructor needs to evaluate tasks completed by learners	
Area	Classroom activities limited to classroom or university	Extracurricular activities, unlimited
Subject	Learners complete tasks with classmates/peers	Learners complete tasks with the community (native speakers)
Interaction	No interaction with the community	Have an interactive relationship with the community
Role of instructor	The instructor can observe and has control during the task	The instructor has no control during the task; students need to complete tasks independently
Challenge and fun	Relatively conservative and easy, the fun will decrease with repetition of the task	More unknown and challenging, more interesting
Task situation	Resembles real-word tasks	Integrates directly with authentic situations
Relation with the community		

Literature Review

There is a linear relationship between foreign language learning and communication. In learning a foreign language, learners generally need to improve proficiency by using the target language. In a survey carried out on 24 multilingual experts by Middlebury Interactive Languages (n. d.) to probe the most useful skills in learning a new language, the common theme revealed that it is necessary to start using the language as soon as possible. It doesn't matter whether one is facing difficulty in learning or understands everything and speaks with perfect pronunciation and enunciation. Instead, it is important to use the language as much as possible and create as many opportunities to speak it. This means learners should speak

to learn. In teaching Mandarin as a foreign language, the discussion of the relationship between foreign language learning and communication can make instructors and learners pay more attention to the function of communication in foreign language learning.

Task-based Language Teaching

Task-based Language Teaching (TBLT) has been implemented for some time and has been recognized as an effective method to improve language communication skills (Edwards & Willis, 2005; Skehan, 2003) as it can offer learners real-time communication with the outside world. TBLT allows language instructors to create more opportunities and context for learners who lack environmental support. This is because a task as a tool can guide learners to engage in certain types of information processing activities that are essential for effective language use and/or for language acquisition from a theoretical perspective (Ellis, 2003). Ellis also provides a comprehensive and succinct definition for this since “a task is a work-plan that requires the learners to process language pragmatically to achieve an outcome that can be evaluated in terms of whether the correct or appropriate propositional content has been conveyed” (p. 4).

In China, where Mandarin is the first language (L1) for the mass population, research on TBLT methods in the field of Mandarin as a Foreign Language began later than in the domain of English language teaching. The earlier studies focused primarily on the theoretical aspects of TBLT. At the same time, research on the specific application of TBLT was relatively limited, but in recent years, research on TBLT application in the learning of Mandarin has seen gradual relevance. Research reports show that the practice of TBLT in Mandarin as a Foreign Language in China emphasizes a student-centered approach, combining classroom teaching and extracurricular tasks. (Ma, 2017; Peng, 2018; Wang, 2019). A study by Li (2017) showed that many foreigners are learning Mandarin in China, but few can speak it. Therefore, the main objective is to enable learners to transform the acquired Mandarin language knowledge into verbal communication skills. Compared with traditional teaching methods, situational teaching methods such as TBLT can better promote learners' Mandarin communicative ability. Several studies have affirmed the role of TBLT methods in the field. For example, it can link learners' real-life experiences and help reduce beginners' perception of Mandarin language difficulty (Peng, 2018). It can also create a relaxed learning atmosphere for learners and reduce learning anxiety (Liu, 2018). It is also viable in improving oral and communication skills (Song, 2019).

Outside China, research on TBLT methods with a focus on the learning of Mandarin as a second or foreign language has also gradually attracted attention, and the feasibility of TBLT methods has been explored through country-specific surveys (Du et al., 2017; Jiang, 2017; Tang, 2020; Yang, 2019). In Malaysia, the current literature on the TBLT method has generally focused more on English as a Second Language (ESL) or English as a Foreign Language (EFL) contexts. It is found that there is limited research on the practice of TBLT in the learning of Mandarin. However, it is acknowledged as one of the five most commonly used teaching methods in Mandarin university classrooms (Liu, 2017).

In summary, the TBLT approach in Mandarin teaching and learning contexts encourages learners to combine classroom learning with authentic situations in real life, promote language skills in completing tasks, and emphasize learning in use. TBLT approach allows learners to transform from passive to active learners and makes them more confident to move from classroom to society. Its positive effect is hence, worth further exploring.

Authentic Situations

Although TBLT emphasizes the combination of classroom learning and authentic situations in real life, it only simulates authentic situations, and activities are still limited to the classroom. Ellis (2003) defines it as situationally authentic, which provides interactional authenticity. She believes it is a form of investment in the real world that creates a relationship with the real world. Earlier, Long (1985) defined a task as "... the hundred and one things people do in everyday life, at work, at play, and in between" (p. 89). Long emphasized that a task must involve real-world activities, for example, borrowing a library book, taking the driving test, typing a letter, or filling out forms. However, the consensus of TBLT is that tasks simulate communication in the real world, and many of them still stay in the stage of simulating the real situation. They regard TBLT as a classroom activity or exercise (Lee, 2000). As such, most TBLT studies have focused on the stage of interactional authenticity than being situationally authentic. Nonetheless, situationally authentic contexts emphasizing authentic situations in the TBLT should be in focus due to their positive effect.

Based on previous studies, this study considers the importance of TBLT in authentic situations. Language serves as a carrier of culture in authentic situations without real context. The language loses the value of communication. Language teaching is, thus, not only the transmission of language knowledge but also the transmission of the thinking mode, customs, culture, and values of a nation. The teaching materials of authentic situations allow learners to directly immerse in the target language and feel its cultural connotation through acculturation experiences, helping learners use the target language to express ideas and communicate real feelings. In this way, language learning is not only the stacking and display of grammar or vocabulary knowledge but also the process of understanding and feeling others. (Yan, Fu, & Wang, 2018). Secondly, authentic situations can improve the learning effect of learners. This is because authentic learning focuses on students' engagement in language tasks that involve real-world meaning. A large body of research has shown that real language learning (AULL) has positive learning effects, such as improvement of motivation, attitude, and language proficiency. (Shadiev et al., 2017).

In addition, TBLT in authentic situations can balance the relationship between the classroom and extracurricular activities. Nowadays, foreign language teaching is based on classroom teaching. When we bring foreign languages into our classroom, we sometimes get lost in the "modernist tenets of our profession" (Kramsch, 2014, p. 297), which entice us to rely on structures that are easy to classify, such as accuracy, standardization, and grammar (Kramsch, 2014). Research also shows that the language in and outside the classroom is distinctively different, and learners may confuse whether the language used outside the

classroom or in the classroom is real. In this context, TBLT in authentic situations can bridge the gap between the language acquired in the classroom and real life (Herrington et al., 2014; Ozverir et al., 2017). Finally, learners can experience authenticity. Due to the contrived nature of foreign language classrooms, learners often feel unreal. Studies have shown that the foreign language classroom becomes a game through the suspension of normal behavioral codes in exchange for an opportunity to practice, perform or prepare for real foreign language use. Whitehead (2021) and Harmer (2007) find the form-centered language teaching method inadequate and argue that it prevents students from obtaining natural input that will help them acquire language because it fails to give them opportunities to activate language knowledge. Studies have also shown that in a context where the target language is not used outside the school, using the guiding characteristics of authentic activities will allow learners to use the target language in a specific context. This, in turn, will facilitate the internalization of newly acquired language structures (Ozverir et al., 2017). Authentic situations of TBLT are important and deserve further attention.

Communication Apprehension

The theory of foreign language learning anxiety was first propounded by Horwitz and Coped in 1986 and divided into communication apprehension or speaking anxiety, test anxiety, and a fear of negative evaluation. Communication apprehension occurs when learners' language vocabulary is far from their communication needs (Kaur, 2013), and they feel depressed and afraid in the communication process. However, when learners doubt their ability to express themselves and worry about their self-image, they experience fear of negative evaluation anxiety (Kaur, 2015). Studies have also shown that speaking a second language foreign language is an anxiety-laden experience for most learners (Kaur, 2015; 2013). In China, Qian (1999) adopted the Foreign Language Classroom Anxiety Level Model designed by Horwitz in 1999 to investigate and analyze the emotional anxiety of international students in learning Mandarin. The results showed that these foreign learners had a certain degree of anxiety due to their nationality and self-evaluation. In Malaysia, Mandarin learning anxiety is also evident among students in higher education. Compared with other studies, Malaysian tertiary students have a higher degree of Mandarin learning anxiety (Zhang, 2016). According to the FLCAS questionnaire survey conducted by Ting et al. (2016) on 210 learners at Universiti Teknologi MARA Malaysia, non-native Mandarin learners contended to have experienced moderate anxiety levels while learning Mandarin; the main factor that contributed to this anxiety was communication apprehension.

Similarly, Ting and Rijeng's (2018) study also revealed the leading cause of Mandarin-speaking anxiety is speaking Mandarin spontaneously. The study proposed that instructors give learners sufficient time for speaking preparation and create a relaxed Mandarin learning environment to decrease anxiety levels among non-native Mandarin learners. It also suggests further investigation through qualitative data. An earlier study by Chan et al. (2012) indicated the more familiar a learner is with the native speaker's manner of speech, the more confident they will be in being able to understand native speakers' speech, therefore, can respond confidently. Hence, the learning mode of more touch and feel familiar can

effectively alleviate the communicative anxiety that Mandarin learners experience. Recent research revealed that the more anxious learners are, the lower their performance would be, and the application of TBLT in the whole intervention process positively impacts learners' performance (Ramamurthy, 2019). When learners make positive statements, work in pairs or groups, complete tasks relevant to real-life contexts, and be treated equally, they experience less pressure (Ramamurthy, 2019).

The above studies indicate that the researchers have focused on learners' speaking anxiety and have provided some feasible suggestions for the problem, hoping to improve learners' confidence in speaking Mandarin by reducing their speaking anxiety. However, there has been no feedback or research on various suggestions and practices to reduce the speaking anxiety of non-native Mandarin learners. There is still a need for more guidance frameworks and discussions on the preparation of learners before speaking and creating a conducive and friendly Mandarin learning environment. Therefore, it is a worthy effort to explore further the application of TBLT in the real world and its influence on reducing non-native Mandarin learners' speaking anxiety. Hence, this paper discusses the relationship between communication apprehension and a fear of negative evaluation with TBLT. The TBLT activity described in this study is a specific case where learners interact with native Mandarin speakers in the real world and presents a guiding framework for non-native Mandarin learners to reduce communication apprehension. This study believes that this is the first step to integrating Mandarin as a foreign language into the community and applying the principle of learning by drawing up the following research objectives.

Research Objectives

Based on the discussion on TBLT and its implementation, the following objectives guided the research.

1. To identify the feelings and perceptions of non-native Mandarin learners when communicating with native Mandarin speakers.
2. To identify the problems, non-native Mandarin learners face when communicating with native Mandarin speakers.
3. To analyze the causes of the psychological barriers and operational difficulties encountered by non-native Mandarin learners when communicating with native Mandarin speakers.
4. To investigate the functional role of TBLT in overcoming communicative anxiety and encourage non-native Mandarin learners to seek more opportunities to communicate with native Mandarin speakers.

Research Questions

The study sought to probe the following questions:

1. What are the affective states of non-native Mandarin learners when using Mandarin to complete tasks with native Mandarin speakers?

2. What psychological/mental barriers and operational difficulties do non-native Mandarin learners face when doing communication tasks with native Mandarin speakers?
3. What are the causes of the psychological barriers and operational difficulties faced by non-native Mandarin learners when doing communication tasks with native Mandarin speakers?
4. What is the influence and effect of TBLT on non-native Mandarin learners in reducing their communicative anxiety?

Methodology

Research Population

The sample was chosen from an accessible population of 75 students (n=75) who registered for a third-level basic Mandarin course at an institution of higher learning in Malaysia. These learners had been learning Mandarin for one and a half years and could manage basic Mandarin skills. They were students from three different faculties - Faculty of Business and Management (33), Faculty of Applied Science (22), and Faculty of Computer and Mathematical Sciences (20). All learners were given the communication task for the first time. Since the task was to be completed during the semester break and all participants were back in their hometowns. Thus, learners' interactions were not geographically limited but included all states in Malaysia (for example, Kedah, Penang, Kelantan, Kuala Lumpur, and Johor).

Operational Mode

According to Richards (2006), speaking activities have three primary functions: to talk as interaction, to talk as a transaction, and to talk as performance. Interaction can occur in a formal or informal setting and focuses on the participants and their social needs. Generally, when people meet, they greet each other, do the opening and closing conversations, make small talk, recount past experiences, and extend compliments to each other. The second type of activity is a transaction that focuses on messages. Examples of these activities are classroom group discussions, making a telephone call to obtain information, buying something in a shop, taking an order from a restaurant menu, and other problem-solving activities, as well as activities that focus on giving and receiving information. On the other hand, the third type of oral activity focuses on performance which requires participants to have a general structure and formal language in delivering information. After considering these various factors, this study emphasized the connection with authentic situations and opted for the first type of activity, interaction as the scope of TBLT activity, and the influence and effect of TBLT on learner communication.

Since the TBLT design in this study assumes that TBLT in authentic situations can reduce learner anxiety in communication and enhance self-confidence and enjoyment in learning, the design of the model adheres to the following principles:

1. Principle of authenticity: The task is not to simulate reality. Instead, it is a situation that happens in the real world.
2. Principle of communicativeness: The task allows learners to interact with native speakers, observe each other's language and life, and understand each other's culture.
3. Principle of fun: The topic of the task is familiar for learners and can increase their interest in participating in the activity.
4. Principle of gradual progress: The task should provide learners with a relaxed and stress-free atmosphere. The task begins as a manageable activity and gradually increases in difficulty, making it more challenging and fun for learners.
5. Principle of diverse assessment: Evaluation should be more comprehensive and diverse, focusing not only on the performance of the activity but also on learners' self-reflection and learning progress.

To operationalize the study, first, the instructor designed a task for learners to be completed during a week-long holiday; learners were required to find a native Mandarin speaker for a simple conversational interview, ask at least three questions using Mandarin and listen to their answers. Examples of questions are: i) What's your name? ii) How old are you? iii) Where are you from? iv) Are you studying or working? v) What's your job?

Specifically, this task was carried out in three stages - pre-task, during a task, and post-task. Before the task, the instructor introduced the topic to pique the learner's interest by activating topic-related words and phrases. Clear explanations and guidelines of the task were offered to learners. The instructor reminded and drove home the point amongst learners that mistakes and errors are a natural part of the foreign language learning process. In performing the task, learners were also required to record the interview. Upon completing the task, the instructor and learners discussed and summarised the task together in a debriefing session. Learners were requested to answer a questionnaire of multiple-choice questions and open-ended questions to understand their background, the process, and the performance of the task.

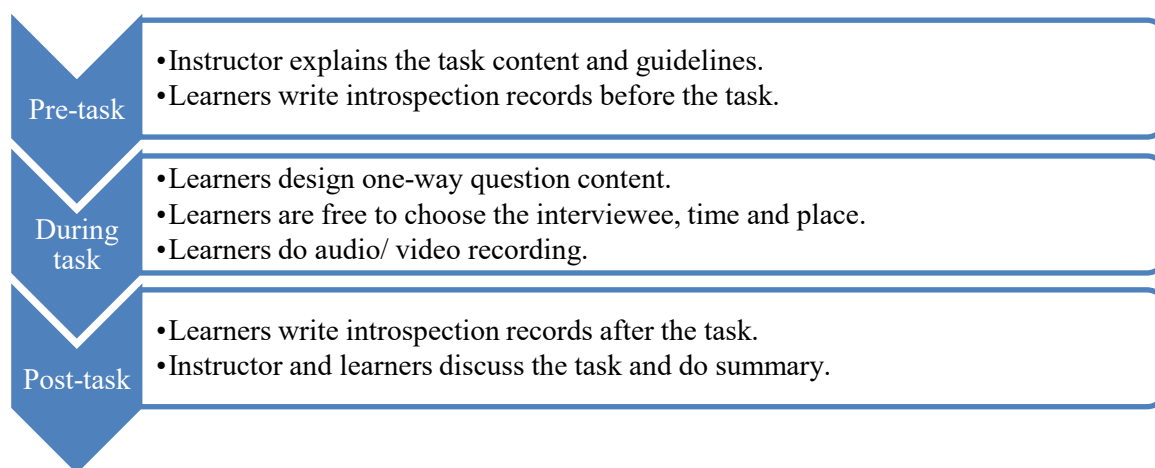


Figure 1: TBLT Model in Authentic Situations

Data Collection Procedures

This study combines qualitative and quantitative procedures. This hybrid study design was used to obtain more detailed and reliable research results.

As questionnaires are unable to reflect learners' emotions and experiences entirely after a clear operational framework were established, the instructor requested learners to complete at least two introspection records - before and after the task, where they had to record their feelings, mental states, perceptions and experiences before and after the task. The study required learners to take notes and record sentiments relevant to the specific research questions. Examples of related questions and requirements were i) How did you feel when you received the task; ii) What feelings and thoughts did you experience during the task; iii) How did you feel after the task; iv) Please describe the steps and circumstances of your task; v) What problems did you encounter in the task; vi) How did you solve the problems you faced; vii) How do you feel about this task. The instructor collected the introspective records and coded and analyzed them accordingly. These introspection records formed part of the analysis of the problems and mental states that learners experienced while completing the task.

Findings

This study revealed that more than 80% of learners experienced using Mandarin to communicate with native Mandarin speakers for the first time. About 13% had previous interactions in Mandarin with native speakers.

Selection of Interviewees

Firstly, we analyzed the interviewees selected by learners and the types of situations/conversations they engaged in. Based on the questionnaire and introspection records, the interviewees that learners sought can be categorized as three types: a) random strangers, b) native Mandarin speakers working in different fields (such as supermarket clerks, drivers, owners of grocery and convenience stores, electrical store employees), c) Chinese individuals known to them (namely friends, ex-classmates, neighbors).

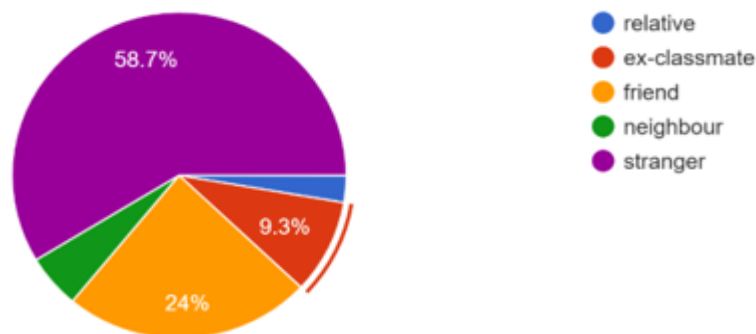


Figure 2: Types of Interviewees

Is this the first time you communicated with the Chinese community in Mandarin?
(excluding your Mandarin Teacher)

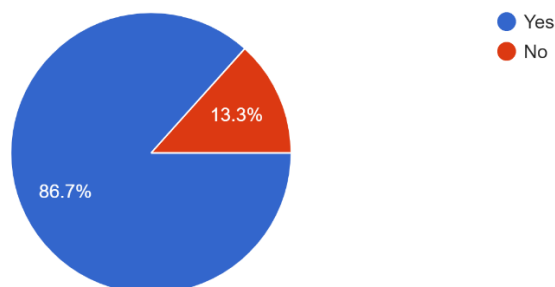


Figure 3: Communication with Chinese

Interestingly, it was found that more than half the learners (58.7%) opted to interview strangers. Most of the learners said in class that they had never communicated with the Chinese community before. The questionnaire results also showed that 86.7% of learners indicated that this was the first time they communicated with the Chinese community in Mandarin. This is commendable as it shows the ability to pluck courage, be forthcoming in completing tasks, and demonstrate an interest in seeking out Chinese (native speakers) interlocutors. Some learners took the initiative to look for interviewees from different shops or specific places, some learners waited and looked for the Chinese on the streets. The native speakers working in the different fields were, on the whole, willing to join the tasks, although there were admissions by learners (S46) about having to “wait patiently due to their busy schedule”, which did not stop them. These learners who sought out strangers also needed more luck because there were remote instances of being declined to be interviewed (S52, S37).

The rest (41.3%) have known their Chinese associates, for example, ex-classmates, friends, and neighbors, and selected people known to them for interviews. According to learners' introspection records, there was no problem encountered when communicating with the Chinese they already knew, and the task went smoothly. One of the learners (S23) said: “I went to my neighbor's house, and she was a hairdresser. Whenever I go home, I ask her to trim my hair; I am her loyal customer. We often gossip and share stories.” The learner said they usually communicate in Malay, but this is the first time she attempted Mandarin in her conversation with the hairdresser.

Pre, During, Post Task Affective States

Next, we analyzed the interaction between learners and interviewees before, during, and after the task and its effect on learners' affective states.

The respondents noted they were generally happy to take on the task. This is supported by their reports which showed they initiated the conversation and always made a typical opening remark to the interviewee before the task, such as introducing themselves, informing the purpose of the task, asking whether the interviewee was free to join the task, and soliciting basic information of the interviewee. This indicates a good level of preparedness and positivity among learners in embracing the task. It was also reported that some interviewees took the initiative to correct learners' sentences and pronunciation. For example, "he corrects my pronunciation after we have completed the tasks" (S16), and "he gives me tips to speak in Chinese" (S33), which the learner well appreciated in the spirit of learning and self-improvement. Other interviewees solicited personal information or opinions to create a warm atmosphere, such as "where are you studying?", "how many years you have learned Chinese?", "is it fun to learn Mandarin?" (S08, S22, S45), all of which created a positive rapport at the start of the task, making it a lot more manageable and a happy experience for learners?

Responses from interviewees after the task were more diverse than expected. In addition to the most basic of praise, blessing, and encouragement, such as "she wishes that I can get A in my Mandarin language exam" (S28), "he encourages me to work hard in learning to speak Chinese" (S45). Some learners were also delighted with the unexpected gifts from the interviewees, such as face creams (S36, visited a beauty product shop) and free drinks. Many learners indicated that the attitude of interviewees affected their mood in the reflection records. Three of them (S04, S17, and S67) recorded this: "I was worried that interviewees were unwilling to cooperate with me before I started. After the interview, I found that she cooperated very well", "When I undertook this task, I was afraid and had no confidence. The process was easy and smooth, thanks to Ashley being nice and open. I felt relieved and happy that Ashley understood my every question" "When I began to speak, I trembled. Thankfully, the Grab driver was patient and smiled, which made me feel better. After finishing the task, I felt honored because I began to have the courage to talk in Chinese." Responses from interviewees made learners feel that their questions had been answered and that they were valued. Overall, interviewees gave positive responses to learners. Hence their first experience of using Mandarin to communicate with the Chinese community came to a successful end.

Psychological Barriers, Operational Difficulties, and the Causes

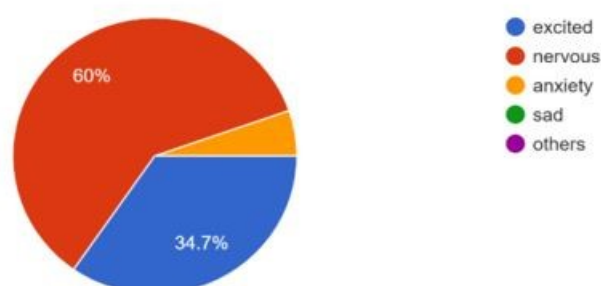


Figure 3: The affective States during the Task

Kaur (2015; 2013) has indicated that anxiety in foreign or second language learning is related to language contexts such as speaking, listening, and learning, as well as anxiety-specific situations. According to the results of this study, more than 60% of learners experienced tension and anxiety, while 34% said they were excited. From learners' introspection records before performing the task, learners' emotions can be divided into three types: one is a positive emotion, such as happiness, excitement, and fun; the second is a negative emotion, such as anxiety, tension, fear, shyness, confusion, no confidence, and sadness; the third is a mixed feeling and complex emotions. When receiving the task, those with positive emotions assumed that the task would provide them with the opportunity to use Mandarin in public places, practice what they had learned, and have the opportunity to communicate with other ethnic groups. This shows that learners look forward to the opportunity to “activate language knowledge” (Harmer, 2007, p. 49) and “internalization of newly acquired language structures” (Ozverir et al., 2017, p. 272).

Learners' anxiety was triggered by two aspects - language ability and personality problems. The psychological barriers of learners were: a) some were worried about the poor effect when communicating with the Chinese community because they still hadn't mastered the Mandarin language; b) some felt they might not be able to complete the task well because they had no experience; c) some thought their introverted personality would affect the result of the task; d) some felt they were shy, so they didn't feel confident when they need to communicate with the Chinese in Mandarin. MacIntyre (1999) developed the idea that learners' personality characteristics cause foreign language anxiety, among which risk awareness and tolerance of ambiguity are the two most important influencing factors. This indicates that learners who are cowardly, lack self-confidence, and lack a risk-taking spirit are more likely to be in fear than ordinary learners. This can be seen through learners' introspection records. One of the learners (S19) wrote:

I am nervous and a little scared when I am given this task. I worry about my Mandarin pronunciation. I am also worried that if the pronunciation is incorrect, it will cause misunderstanding between the interviewee and me. I am scared and shy because I'm an introvert, and it's hard for me to start a conversation with someone I don't know.

Another learner (S54) also mentioned her anxiety, saying, “I can't speak Mandarin fluently. I am shy, and I am afraid of making mistakes. I am going to deal with real Chinese.” The learners' feedback, for example, the words “shy” and “introverted”, can be explained as they are self-conscious that their personality affects their communication with others in Mandarin. Thus, they face social anxiety and anxiety of negative evaluation. They feel nervous and anxious because they are unable to pronounce words correctly and can't speak Mandarin fluently, which will lead to less desirable results, such as misunderstanding between the two sides. Learners are also worried because they assume that others would have a negative evaluation of them. For example, S54 especially emphasized that they are dealing with the actual Chinese community, and the fear is that they would certainly know if she made a mistake. Of course, there are learners (S28) who are more willing to accept new things; she had mixed feelings when receiving the task: “I am very nervous and don't have the

confidence to interview others. But on the other hand, it's exciting because I can practice what I've learned.”

In practical operation, reports showed learners were faced with the problems of the interviewee, traffic, the surroundings (environment), and recording. However, their continuous attempts and efforts resolved all these problems and challenges. For example, S17 wrote:

I am worried about finding suitable interviewees. I went to Tesco Kota Bharu to look for it, but many people turned me down. I didn't give up, so finally, I changed my approach, went to Matrikulasi, and found a learner willing to accept my interview.

Similarly, when the environment was too noisy for an interview, S68 chose to change their location: “The playground was too noisy for an interview, so we moved to another place.” Others chose to continue their interview in the same places, such as restaurants or trains, but they had to increase their volume (S22, S54). Some learners were dissatisfied with their recording effect, so they had to rerecord. S57 said: “I feel nervous about asking questions and recording simultaneously until I forgot to record the conversation.”

TBLT Effect on Reducing Communicative Anxiety

When probed if learners would find the courage to communicate with the Chinese community in Mandarin in the future, the following results emerged.

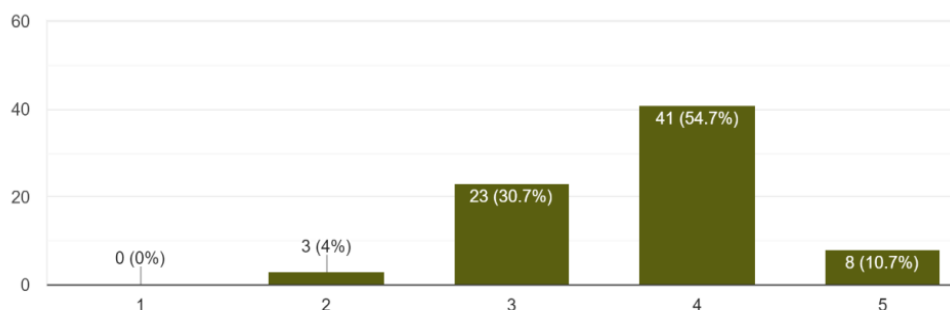


Figure 4: Learners Who Would Communicate with Native Speakers Again

According to the questionnaire, about 65% of learners became more inspired to communicate with the Chinese community after this task. Learners' feedback in their introspection records showed 100% positive responses. Most learners believed the task provided them with many opportunities, such as the opportunity to practice what they had learned and to communicate further with others. Examples of learners' introspection records were “I felt very excited during the whole process, because I had the experience of speaking Mandarin outside, and before that, I only used Mandarin in the classroom” (S28); “I feel my Mandarin has improved and feel more confident in using it in public” (S17); “I feel very happy. I feel more confident to speak Chinese with native Chinese speaker” (S42). Many learners also reported positive transitions after the task, significantly when it helped them build confidence in communication. This improvement is in line with other research on

outdoor environment and oral English skills through interview analysis. It has also shown that learners believed the authentic outdoor environment increased their confidence and intrinsic motivation to develop verbal English skills. Learners are usually more willing to communicate in the target language due to increased confidence, authentic language use, and interesting learning styles (Myhre & Fiskum, 2020). As one of the learners reflected introspectively: “I approach the task as a challenge. But after completing the task, it inspired me, and I hope to use Mandarin often or try to use it in society in the future” (S42). Another learner (S17) said: “I felt nervous and shy before I started because I had to talk to someone else; But after completing the task, I feel very excited. An interviewee is not enough!” This renewed confidence and excitement in communicating with native Mandarin speakers (Chinese learners) undoubtedly surpassed all cultural barriers and preconceived prejudices that learners may have held about the Chinese community. None of the respondents recorded or expressed sentiments of cultural inhibitions, prejudice, or uncomfortable racial sentiments when conducting the interviews with their Chinese interlocutors. This dispels the notion (if any) that the learners feared the Chinese community, as evidently, heightened confidence implies the notion of cultural differences did not impose a hindrance to communication in any way.

Discussion

The results of this study have revealed four significant advantages of TBLT, which follow five principles to help learners reduce communication apprehension and encourage them to communicate with native Mandarin speakers more confidently. First, the task provided learners with participatory topic choices. Learners needed to carry out the most basic and simple interaction content of self-introduction when meeting people for the first time. Research shows that if the topic chosen by the instructor is beyond the scope of the learner’s knowledge or ability, the learner will have a certain degree of anxiety (Qi, 2008). Secondly, learners were free to choose the time, place, and suitable interviewee. The more elements they mastered before communication, the more confident they would be. For example, the learners could start the interview with their familiar old classmates, friends, and neighbors and have the alternative of choosing a suitable place. Thirdly, in this task, learners as interviewers were active participants who prepared and practiced in advance to reduce the pressure and anxiety of immediate response during conversations. If learners have enough preparation before speaking, their anxiety will also be reduced (Ting & Rijeng, 2018). For language learners, proper repetition and mechanical practice are necessary because constant repetition of unfamiliar topics can also help to organize and formulate speech content (Qiu, 2020). Even learners with weak abilities could rely on some fixed phrases to strengthen their confidence in communication. Fourthly, the dialogue was stored in the form of recording, not on-site performance and evaluation. Even if the learner made a mistake, as long as the interviewee was willing, the learners could rerecord the conversation, so learners had the opportunity to learn through mistakes. In addition, the form of recording is also convenient for learners to listen, self-evaluate, modify, note positive reinforcement and error correction (Lai & Zhao, 2006).

Next, we will further discuss details on the influence and function of this TBLT from three aspects, namely, the response of interviewees, negative assumptions of interviewers, and authentic situations for learning.

1. **Responses of interviewees.** This study found that interviewees' attitudes affect the psychological state of learners' communication, and friendly interviewees can reduce learner anxiety in completing the task. Rejection, unfriendliness, and distrust of interviewees will affect learner confidence, and they will feel frustrated even before they begin. One learner (S52) recorded: "The problem I have is that it is complicated to meet Chinese in XX city, and some of them are very proud, which makes me feel bad." Here, we need to pay attention to the psychological changes of learners in communication. They would hope to get the interviewees' approval in communication. When the situation is not as expected, learners feel pain, anger, self-pity, indecisiveness, and finally quit (Qi, 2008). Conversely, if learners feel that their words can be understood, they will feel that they can speak or even want to speak more (Yan, Fu, & Wang, 2018). Hence, socially friendly responses are essential as they help reduce learners' anxiety levels.
2. **Negative assumptions of interviewers.** Although many participants in this study had negative emotions and thoughts, such as worry and lack of confidence when they received the task, while more than 60% still felt nervous and anxious during the task, this situation changed after the task was completed. At the end of the task, all the learners in this study gave 100% positive comments on the task assigned to them. They did not think that it would not work, although some of them had encountered operational difficulties. Instead, they thought it was interesting to communicate with native Chinese speakers in Mandarin. The reason for learners' nervousness before and during the task was because most of their communication exercises had previously been conducted in class, and they had only communicated with non-native Mandarin speakers they were familiar with. Most of them had never communicated with native Mandarin speakers before. When they accepted the task of communicating with native Mandarin speakers, they had many uncertainties in their minds. They were uncertain whether their Mandarin proficiency, pronunciation, or sentences were up to the mark for the task. All this stemmed from the situation where learners were unaware of the reality, therefore, were not confident in facing the situation. Several studies have found that low confidence leads to fear of public communication (. But once the learners completed the task, a positive change was experienced in their minds. This is because, in authentic situations, most interviewees provided friendly responses when learners spoke, such as giving hints, keywords, and smiles, which made the interviewers feel the warmth. Such personal experience made learners aware that real-world practice is not as daunting as they had thought. Although their language is non-standard, it is still acceptable in practical, social communication, as most respondents were willing to reach out for more support and help. From this study, it was found that experiencing and practicing situations in person can help eliminate negative assumptions, improve self-confidence, and reduce communication apprehension. This also reflects the vital function of TBLT in

authentic situations, which can cement the gap between language acquired in the classroom and real-life (Herrington et al., 2014; Ozverir et al., 2017).

3. ***Fun learning in a real environment.*** This study found that all learners gave an affirmative evaluation of TBLT. Many learners were nervous and anxious before performing the task, but they felt satisfied and experienced much satisfaction after completing the task. According to research, real-life activities of authentic situations create a fun learning environment that allows learners to move around freely and without anxiety. The more they engage in these activities, the less anxious they will be (Ramamurthy, 2019). Interestingly, compared to communicating in class, learners may not be as anxious as we think when they practice speaking outside the classroom, which is the actual (authentic) situation. According to research in China, some international students feel a higher degree of anxiety in the classroom because the teacher would correct their mistakes, so they are psychologically nervous and afraid of making mistakes. After class, because of the wide range of subjects to speak, including the Chinese community, classmates, and language partners, international students are more relaxed. Hence, the anxiety about speaking Mandarin is reduced (Yu, 2013). Being authentic can reduce learners' retreat from being tied up by the "accuracy, standardization, and grammar" (Kramsch, 2014, p. 297) of foreign language learning in the classroom. Mandarin classes should encourage more TBLT methods involving authentic situations. Von Worde (2003) suggests that teachers create a relaxed atmosphere for beginners and include topics of interest to learners. TBLT method improves learners' participation, provides new experiences and opportunities for authentic communication, meets learners' immediate needs, and enhances confidence in communication. This study believes that if learners are given similar tasks several times or repeatedly, they would be more confident communicating with native Mandarin speakers.

This TBLT is the first step for learners to practice the language in an authentic situation, allowing them to understand that using the third language in authentic situations is not as difficult as they may perceive it to be. Mandarin instructors should encourage learners to integrate language into their lives. For example, when they go to a Chinese store or meet a Chinese salesman or sales assistant, they can try to greet them and ask about the price of items in Mandarin. They can also try reading and understanding simple Chinese characters on signboards and menus. They can use Mandarin online, even if it is only a short sentence daily. Only by integrating language into life, the language will belong to the learners. Hence, the first step is the most crucial as it instills awareness, confidence, and belief that it is not daunting, and there is a lot of attainment value in integrating the use of a third language in real-life situations.

This study proves that TBLT in authentic situations positively influences and reduces learners' communication anxiety, enhancing communicative confidence and learning enjoyment. When learners' communicative skills improve, they will be more willing and courageous to participate in TBLT involving authentic situations, thus forming a virtuous circle.

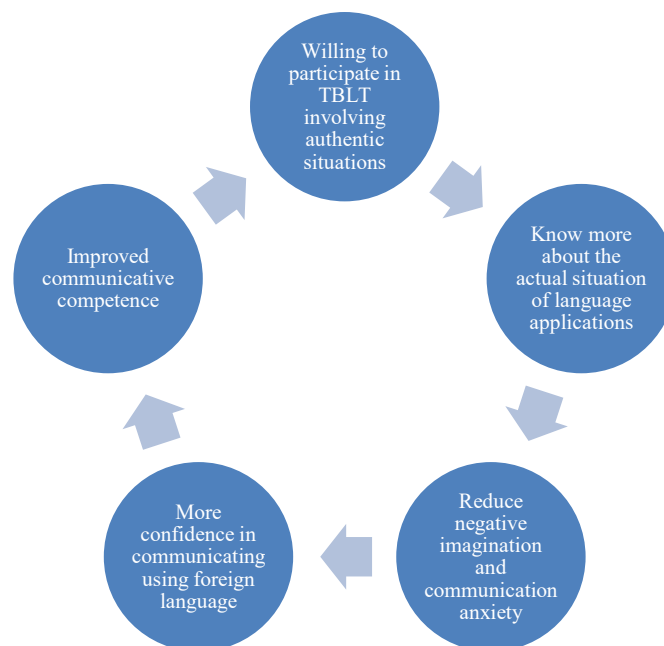


Figure 5: TBLT Involving Authentic Situations and Improving Communication Skills

Conclusions and Recommendations

There have been many studies on the need for learners to use the target language in real life. After many years of learning Mandarin, we hope to see that learners can conduct essential communication in their daily lives. However, many cannot initiate the first step of communication in daily activities due to passive personality and lack of opportunities to communicate with native Mandarin speakers. Therefore, TBLT in authentic situations plays an important role in this context.

In addressing the objectives of the study, the study has found that most learners felt excited, yet some were nervous and anxious during the TBLT tasks. The anxiety was mainly caused by their limited language ability, compounded by introverted personality traits. These learners felt worried that their performance was not ideal and that respondents (the native Mandarin community) would negatively evaluate them. In overcoming these, learners rose to the challenge. They could overcome and solve all the operational difficulties easily, even though many of these operational difficulties occurred during unprecedented situations. This study found that after communicating with native Mandarin speakers, learners' feelings and perceptions began to change, from worry and anxiety to excitement and relaxation. The experience of internal “combat” or conflicts could eliminate many of their negative assumptions, cement the gap between classroom language acquisition and real-life practical language experience, and learners find renewed confidence in communicating with native Mandarin speakers.

This TBLT method is not the mainstream approach to teaching. Nevertheless, it needs to be integrated into the curriculum, lest learners will only learn the classroom language rather than the language that can be used in real life. Therefore, instructors must offer essential

opportunities and platforms for learners to experiment with classroom learning in authentic situations beyond the classroom walls. Some learners may need support or some form of trigger or stimulant to help them engage with target speakers. In this regard, instructors are crucial in providing as many opportunities as possible for learners to communicate with native Mandarin speakers. The more familiar learners are with the way native Mandarin speakers communicate, the more confident they will be in understanding and responding to the conversation (Chan et al., 2012). In this framework of TBLT, learners begin to realize the importance of language practice, reduce communication apprehension, and build self-confidence. Thus the seed of interaction with the Chinese society is sowed for successful germination in the future.

Additionally, this study did not incorporate the entire cycle of long-term observation of the TBLT model. The full TBLT model involves multiple tasks at different stages, which require learners to complete three stages of tasks involving authentic situations in one semester. The tasks of the second and third stages in the entire cycle will gradually increase in challenge and difficulty for learners' interview questions. However, due to the sudden outbreak of the pandemic, the first task has been completed thus far. Therefore, this study reports the results of the first stage task. In this way, future research can obtain more observations from the long-term process. Due to the positive results of the first stage task, this study infers that the second and third stage tasks will also develop and yield positive outcomes.

Future research on TBLT in authentic situations can also explore and integrate other theoretical frameworks such as experiential learning, learner autonomy, socio-cultural perspectives in learning, and metacognition in learning with TBLT to obtain a comprehensive and varied perspective on the implementation of TBLT at higher learning institutions.

Although many TBLT forms involve authentic situations using technology-assisted communication such as media platforms to communicate, the researchers believe it is still necessary for learners to integrate with the community. This is because language exists to close the gap and narrow the perceived distance among people. Learners cannot always stay in the virtual world with computers and the Internet. At this stage, we cannot physically go into the community with ease, but we can do the necessary preparation and hope when the time is right. We can encourage learners to integrate with the community again and experience the relevance and need for communicating with people through authentic communicative language.

Conflict of Interest

The authors declare that no conflict of interest was recorded in carrying out and reporting this study.

References

- Arulchelvan, P., & Yunus, M. (2020). Whatspeak : Audiovisual digital assessment in enhancing confident and independent speaking skills. *Universal Journal of Educational Research*, 8(7), 2816-2824. <https://doi.org/10.13189/ujer.2020.080708>
- Bao, R., & Du, X. (2015). Implementation of task-based language teaching in Chinese as a foreign language: Benefits and challenges. *Language, Culture and Curriculum*, 28(3), 291–310. <https://doi.org/10.1080/07908318.2015.1058392>
- Chan, S. H., Abdullah, A. N., & Yusof, N. (2012). Investigating the construct of anxiety about speaking skills among ESL tertiary learners. *3L: Language, Linguistics, Literature®*, 18(3), 155-166. <https://ejournal.ukm.my/3l/article/view/1120/1012>.
- Du, X., Zhao, K., Ruan, Y., Wang, L., & Duan, X. (2017). Beginner CFL learners' perceptions of language difficulty in a task-based teaching and learning (TBTL) environment in Denmark. *The system*, 69, 108-120. <https://doi.org/10.1016/j.system.2017.07.001>.
- Edwards, C., & Willis, J. R. (2005). *Teachers exploring tasks in English language teaching*. Springer.
- Ellis, R. (2003). *Task-based language learning and teaching*. Oxford University Press.
- Harmer, J. (2007). How to teach English (new ed.). *England: Pearson Education Limited*.
- Jiang, Y. L. (2017). Reducing jiaoxuefa zai dui Han chuji hanyu kouyu jiaoxuezhong de yingyong yanjiu [Research on the application of task-based teaching method in the primary oral Chinese teaching in Korea]. *Journal of Liaoning Agricultural Vocational and Technical College*, 19(5), 32-34.
- Kaur, N. (2017). The role of peers and cultural tools in supporting autonomous learning behaviors among Malay tertiary learners. *Pertanika Journal of Social Sciences and Humanities*, 25(1), 61-80. http://www.myjurnal.my/filebank/published_article/56450/5.pdf
- Kaur, N. (2015). *Making meaning of vocabulary learning: Seizing opportunities at opportune moments*. *GEMA Online® Journal of Language Studies*, 15(2), 1-16. <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.912.9842&rep=rep1&type=pdf>
- Kaur, N. (2013). [The need for autonomous vocabulary learners in the Malaysian ESL classroom](https://ejournal.ukm.my/gema/article/viewFile/4216/2334). *GEMA Online Journal of Language Studies* 13(3), 7-16. <https://ejournal.ukm.my/gema/article/viewFile/4216/2334>
- Kramersch, C. (2014). Teaching foreign languages in an era of globalization: Introduction. *The Modern Language Journal*, 98(1), 296–311. <https://doi.org/https://doi.org/10.1111/j.1540-4781.2014.12057.x>
- Lai, C., & Zhao, Y. (2006). Noticing and text-based chat. *Language Learning & Technology*, 10(3), 102-120. http://128.171.57.22/bitstream/10125/44077/10_03_laizhao.pdf.
- Lan, Y. J., & Lin, Y. T. (2016). Mobile seamless technology-enhanced CSL oral communication. *Journal of Educational Technology & Society*, 19(3), 335-350. <https://www.jstor.org/stable/pdf/jeductechsoci.19.3.335.pdf?refreqid=excelsior%3Ab468dc095bc5b53d97b2f556ddabc130>
- Lee, J. F. (2000). *Tasks and communicating in language classrooms*. McGraw-Hill.

- Lew, Y. L., & Kaur, N. (2021, May 27-28). *Google translate in Mandarin writing: A boon or a bane?* Paper presented at International Conference on Language Education (iCOLE 2021), Universiti Teknologi MARA Perlis Branch, Malaysia.
- Lew, Y. L., Wong, H. C., & Kaur, N. (2021). *Communication anxiety among non-native Chinese learners: Practice and reflections on task-based language teaching (TBLT)*. Paper presented at International Conference of Research on Language Education (i-RoLE 2021). Universiti Teknologi MARA Melaka Branch, Malaysia.
- Li, Y. (2017). *Jiyu qingjing jiaoxuefa zai duiwai hanyu chuji kouyu jiaoxuezhong de jiaoxue sheji* [Instructional design based on situational teaching method in primary oral Chinese teaching as a foreign language, Master thesis, Chongqing University]. <https://cdmd.cnki.com.cn/Article/CDMD-10611-1017838594.htm>.
- Liu, C. (2018). *Jiyu qingjing chuangshefa dui waiyu kouyu jiaoxue anli yanjiu* [A Case Study of Oral Chinese Teaching Based on Situational Innovation, Master thesis, Bohai University]. <http://cdmd.cnki.com.cn/Article/CDMD-10167-1018126921.htm>
- Liu, H. N. (2017). *Malaixiya gaoxiao hanyu zuowei eryu jiaoxuefa yanjiu* [Research on teaching Chinese as a second language in Malaysian universities, Doctoral thesis. Minzu University of China]. <https://cdmd.cnki.com.cn/Article/CDMD-10052-1018068121.htm>.
- Long, M. H. (1985). A role for instruction in second language acquisition: Task-based language teaching. *Modeling and Assessing Second Language Acquisition*, 18, 77–99.
- Ma, M. L. (2017). Shixi renwuxing jiaoxuefa zai duiwaihanyu kouyu jiaoxuezhong de yunyong [Analysis of the application of task-based teaching methods in oral Chinese teaching as a foreign language]. *Time Education*, 11, 123-125.
- MacIntyre, P. D. (1999). Language anxiety: A review of the research for language teachers. In D. J. Young (Ed.), *Affect in a foreign language and second language learning: A practical guide to creating a low-anxiety classroom atmosphere* (pp. 24-45). McGraw-Hill.
- Middlebury Interactive Languages (n. d.). 24 polyglot experts reveal the 2 most useful tips to learn a new language. <https://www.summerlanguageacademy.com/blog/language-learning>.
- Myhre, T. S., & Fiskum, T. A. (2020). Norwegian teenagers' experiences of developing second language fluency in an outdoor context. *Journal of Adventure Education and Outdoor Learning*, 1-16. <https://doi.org/10.1080/14729679.2020.1769695>.
- Ozverir, I., Osam, V., & Herrington, J. (2017). International Forum of Educational Technology & Society investigating the effects of authentic activities on foreign language learning: a design-based research approach. *Journal of Educational Technology & Society*, 20(4), 261–274. <https://www-jstor-org.libproxy.udayton.edu/stable/pdf/26229222.pdf?refreqid=excelsior%3A3677fa9f975b4f765b52e68864e0e4ab>
- Peng, Y. (2018). *Task-based language teaching for Chinese as a second language: Teaching practice and teacher cognition* [Doctoral thesis, Queen's University at Kingston].
- Qi, F. (2008). Language anxiety and teaching oral Chinese as a foreign language: A study on topic selection strategies for reducing communicative fear. *Journal of Language and Literature Studies*, 10A, 162-164.

- Qian, X. J. (1999). The anxiety of foreign students learning Chinese. *Language Teaching and Linguistic Studies*, 2, 144-154.
- Qiu, X. (2020). Functions of oral monologic tasks : Effects of topic familiarity on L2 speaking performance. *Language Teaching Research*, 24(6), 745-764. <https://doi.org/10.1177/1362168819829021>.
- Ramamurthy, V. (2019). The effects of task-based approach on speaking anxiety among ESL low proficiency diploma students. *Universal Journal of Educational Research*, 7(6), 1363–1375. <https://doi.org/10.13189/ujer.2019.070604>.
- Richards, J. C. (2006). Developing classroom speaking activities: From theory to practice. *RELC Journal*, 28(2), 3-9. <https://www.professorjackrichards.com/wp-content/uploads/developing-classroom-speaking-activities.pdf>.
- See, S. Y., & Ching, T. H. (2018). Mandarin as the chosen foreign language course among learners of foreign languages: A case study. *Journal of Arts, Science & Commerce*, 3(1), 80-88. https://www.researchgate.net/profile/Sy_See2/publication/327102731_Mandarin_as_the_chosen_foreign_language_course_among_learners_of_foreign_languages_A_case_study/links/5b7845ed4585151fd11f767f/Mandarin-as-the-chosen-foreign-language-course-among-learners.
- Shadiev, R., Hwang, W.-Y., & Huang, Y.-M. (2017). Review of research on mobile language learning in authentic environments. *Computer Assisted Language Learning*, 30(3-4), 284-303.
- Skehan, P. (2003). Task-based instruction. *Language Teaching*, 36(1), 1-14. <https://doi.org/10.1017/S026144480200188X>.
- Song, Y. (2019). *Jiyu renwuxing jiaoxuefa de duiwaihanyu chuji kouyu jiaoxue sheji* [Design of primary oral Chinese as a foreign language based on task-based teaching method, Master thesis, Xi'an University of Architecture and Technology]. <https://cdmd.cnki.com.cn/Article/CDMD-10703-1020803247.htm>.
- Tang, J. (2020). *Jiyu renwuxing jiaoxuefa de Wuzhibiekeshan zhongji hanyu zongheke jiaoxue sheji* [Task-based teaching design of Uzbekistan intermediate Chinese comprehensive course, Master thesis, Hubei University of Technology].
- Timina, S. (2015). Causes of English speaking anxiety among Taiwanese university students. *Proceedings of INTCESS15-2nd International Conference on Education and Social Sciences*, 1305-1309.
- Ting, H. L., & Rijeng, J. S. (2018). An investigation on Mandarin-speaking anxiety among non-native Mandarin learners. *Academic Journal of Business and Social Sciences (AJoBSS)*, 2, 1-9. <https://ir.uitm.edu.my/id/eprint/29996/1/29996.pdf>.
- Ting, H. L., Yeo, J. Y., & Chin, V. (2016). Mandarin language learning anxiety among non-Chinese learners: A case of Universiti Teknologi MARA, *Issues in Language Studies (ILS)*, 5(2), 18-27. <https://publisher.unimas.my/ojs/index.php/ILS/article/view/1633>.
- Van Eekelen, I. M., Boshuizen, H. P. A., & Vermunt, J. D. (2005). Self-regulation in higher education teacher learning. *Higher Education*, 50(3), 447-471. <https://doi.org/10.1007/s10734-004-6362-0>
- Von Worde, R. (2003). Students' perspectives on foreign language anxiety. *Inquiry*, 8(1). <https://files.eric.ed.gov/fulltext/EJ876838.pdf>.

- Wang, Y. F. (2019). *Renwuxing jiaoxue moshixia de duiwai hanyu zhongji kouyu jiaoxue sheji* [Intermediate Oral Chinese Teaching for Foreigners under the S-type Teaching Mode, Master thesis, Minzu University of China]. <https://cdmd.cnki.com.cn/Article/CDMD-10052-1019190859.htm>.
- Whitehead, S. J. (2021). "I thought we weren't in Spain!": Discursive negotiations of realness in a foreign language classroom. *System*, 100, 102532. <https://doi.org/10.1016/j.system.2021.102532>
- Yan, H., Fu, J. J. & Wang, X. (2018). The definitions and teaching principle of "task" in task-based language teaching. *Advances in Education*, 08(06), 711–717. <https://doi.org/10.12677/ae.2018.86113>
- Yang, Y. M. (2019). *Renwuxing jiaoxuefa zai Keniya chujia kouyuke de yingyong yanjiu* [A study on the application of a Task-based Approach in the elementary oral Chinese class in Kenya, Master thesis, Lanzhou University].
- Yong, Y. M., Cheng, C. Y., & Lee, C. K. (2016). *Analysis of practical Mandarin during short-term learning and traveling program in China among non-Chinese students*. Paper presented at International Language and Tourism Conference 2016 (ILTC 2016). <https://www.researchgate.net/publication/315115362>
- Young, D. J. (1990). An investigation of students' perspectives on anxiety and speaking. *Foreign Language Annals*, 23(6), 539-553. <https://doi.org/10.1111/j.1944-9720.1990.tb00424.x>.
- Yu, X. R. (2013). *Liuxuesheng hanyu jiaoji yiyuan ji qi yingxiang yinsu yanjiu* [A study on the willingness of foreign students to communicate in Chinese and its influencing factors, Doctoral thesis, Nanjing University]. <http://cdmd.cnki.com.cn/Article/CDMD-10284-1013359587.htm>.
- Zhang, W. (2016). *Malaixiya daxuesheng hanyu jiaoliu yanjiu* [Research on Chinese Learning Anxiety of Malaysian College Students, Master thesis, Beijing Foreign Studies University]. <http://cdmd.cnki.com.cn/Article/CDMD-10030-1017006203.htm>.

**PERCEIVED SATISFACTION TOWARDS EMERGENCY
REMOTE TEACHING AMIDST COVID - 19 CRISIS: A
CASE AMONG UNDERGRADUATE STUDENTS IN
PENANG, MALAYSIA**

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ABSTRACT

The current pandemic has triggered emergency remote teaching (ERT) to be implemented by higher education institutions globally. This unprecedented circumstance caused serious dissonance between students' learning experience and overall satisfaction. Hence, this research aims to determine the factors influencing their satisfaction with ERT implemented by higher learning institutions in Penang, especially among undergraduate students. Based on the underpinning unified theory of acceptance and use of technology (UTAUT), the four vital influencing factors identified in this study include the usefulness of online materials, network stability, the usability of e-learning platforms, and peer interactions. A total of 504 responses were analyzed using SPSS software. Results indicate that the use of online materials and the usability of e-learning platforms were critical determinants of satisfaction with ERT among undergraduate students. At the same time, internet stability and peer interactions have no significant influence. This current study concludes with relevant implications and recommendations for higher learning institutions to consider to thrive in this changing education landscape.

Keywords: Online learning, Pandemic, Higher Learning Institutions

Introduction

The global Covid-19 outbreak spread worldwide started at the end of 2019, and lockdowns and staying home strategies were implemented to flatten the curve and stop the spread of the virus (Sintema, 2020). This pandemic has affected various industries and learners from all levels of studies, whereby all private and public institutions discontinued their face-to-face teaching. There was an immediate need worldwide to innovate and implement alternative learning methods. COVID-19 pandemic in 2019 has changed the mode to online delivery and mostly finds it convenient due to existing training. However, most are still dissatisfied with technical difficulties of internet connection and computer expertise limitations (Rahim et al. 2020). Moaward (2020) stated that students' expectations are mainly influencing factors for instructors to consider practical technology tools for all the online courses and the satisfaction impact by learning convenience created using the combination of all the e-learning tools made available by the institutions.

Past research on online and distance learning educational technology has analyzed distance learning, distributed learning, blended learning, online learning, mobile learning, and others. Emergency remote teaching (ERT) is a concept found to be practiced and delivered during pressing circumstances, mainly during the COVID-19 pandemic (Hodges et al., 2020). Online and blended learning are usually planned and designed from the beginning, but emergency remote teaching (ERT) is more temporary due to crisis circumstances. ERT fully uses the remote teaching facilities in terms of the available platforms and materials, which will continue through face-to-face lessons, hybrid or blended mode once the emergency end. The main objective of the ERT is not to re-create an educational system but rather to activate the temporary access and the relevant platforms to continue the students' education process (Zimmerman, 2020).

As some higher institutions have been utilizing the online learning tools and materials since the very early stages, transforming to ERT during an emergency state in the country may be more feasible. Education is an essential service even during an emergency as an uneducated mass could, in the longer term, contribute to instability and weak countries (Burde et al. 2011). Those institutions in practice since early online or hybrid and other forms of virtual learning can cope in diverting to ERT. Still, for new ones, this could impose various challenges and result in student satisfaction. Some key elements contributing to students' satisfaction are enhancing the efficacy of knowledge, more accessible communication, and reducing physical contact. These ensure a safe environment, proper accommodation for learning purposes, opportunities to learn anytime and anywhere, cost-effectiveness, and encouragement of innovation (Igbokwe et al. 2020).

Embi (2011) has mentioned that the Malaysian Ministry of Higher Education (MOHE) has strategically planned for transition to online learning as one of their Critical Agenda Projects (CAP) and was participated by 90% of Malaysia Higher Education Institutions (HEI) as their future objective. Online learning is not a new venture for higher institutions in Malaysia, and 90% have e-learning policies, of which 70% have made it compulsory for their lecturers and students to utilize these facilities (Embi & Adun, 2010). In Malaysia, public and private

institutions formed higher education for undergraduate and postgraduate programs, transforming Malaysia into an educational hub in South East Asia. Nearly 50% of these higher institutions offer courses online (Selvaraj et al., 2014). MOHE is taking various initiatives to improve the education system to enhance higher learning institutions' creativity, innovation, leadership, and entrepreneurship.

Penang is a popular destination for many multinational companies such as Dell, Intel, Abbott, Agilent, and Canon due to its accessibility, infrastructure, and logistics, creating a demand for skilled graduates. As a state rich in historical and cultural heritage, Penang strives to be a world-class education hub in the region, attracting local and international students by promoting its first-class institutions of higher learning and affordable cost of living.

Although the private or the public higher learning institutions strategized the planning of online learning a few years ago, there are still grey areas to be improved to provide an influential students' satisfaction with these online learning and ERT. Education institutions' adoptions and students' satisfaction with the online learning experiences depend not only on the user interface (UI) but also on other factors such as technology, system design, environmental category, students, facilitators, and the courses themselves (Aning & Baharum, 2020). According to Narayanan and Selvanathan (2017), students' assessments and feedback are limited in online education, making it difficult to receive feedback for improvements.

Online education also found a lack of interactions among the undergraduates as they prefer face-to-face communications for teamwork and discussions. Lack of discipline in adhering to deadlines and managing files technically due to lack of facilities affects the motivation and contributes to their poor performances (Narayanan & Selvanathan, 2017). Students' fear of online challenges caused by their attachment to conventional approaches results in emotional distress and resistance to change (Aguilera – Hermida, 2020). With the pandemic fear and uncertainty and the sudden panic, students were found to experience a lack of motivation and an unwillingness to continue. In other research, it was found that emergency remote teaching (ERT) often results in depression, anxiety, and other mental – health-related issues that impact students' satisfaction (Gillis and Krull, 2020).

Given the severe long-term implication of ERT and the need to further understand its' effectiveness from students' perspective, this research aims to assess the key factors contributing to students' satisfaction with the ERT during the pandemic. It hopes that the results from this study will assist higher education institutions, especially those in Penang, Malaysia, in optimizing teaching and learning quality during COVID-19.

Literature Review

Students' Satisfaction

According to Gungor (2007), satisfaction can be defined as an overall or global judgment concerning the extent to which a product and service can meet customers' expectations.

Students' satisfaction is essential in considering the effectiveness of online learning as it will determine the effectiveness of adopting the system. It includes various elements such as learning effectiveness, quality of online education, and faculty satisfaction (Alqurashi, 2019). Students' satisfaction with online learning is contributed by various online rather than face-to-face lectures, technology-mediated rather than close group discussions, and electronic methods of mediums rather than physical interactions with instructors (Van Wart et al. 2020). These students' satisfaction expectations lead to various challenges for instructors, such as mastering the new techniques while maintaining the educational integrity and providing a quality online learning mode of delivery (Brinkely-Etzkorn, 2018). Amongst elements identified in students' satisfaction with this online learning are student connections, active learning process between instructors and peers, practical education, learner independence, and technology advancement (Clayton et al. 2018).

Students' satisfaction factors are also contributed by engaged learning. They expect support to facilitate their learning, recognize their abilities and accomplishments, and lastly, on the assessments and their performance feedback (Dziuban et al. 2015). Thus, the roles of students are also crucial in technology to enhance learning, or else inactive cognitive learning due to students' passive behavior would lead to undesirable learning outcomes (Wang & Wegerif, 2019). Students' perceived satisfaction is often reflected in their learning effectiveness and their assessment of the quality of learning mechanisms (Moore, 2005).

Key Factors Influencing Students' Satisfaction

The Unified theory of acceptance and use of technology (UTAUT) model was designed to predict innovation usage behavior (Talukder, 2014). The four main elements include performance expectancy, effort expectancy, social influence, and facilitating conditions (Myung et al. 2011). This study adapts the model from Myung et al. (2011) to study the impact of these four elements on user satisfaction. UTAUT model has been used and applied for testing for predicting system usage and ensuring the technology adoption and usage decisions in various fields, such as interactive whiteboards for teaching purposes. UTAUT model was formulated using eight technology acceptance models, which are the Theory of Reasoned Action (TRA), the Theory of Planned Behavior (TPB), the Technology Acceptance Model (TAM), the Combined-TAM-TPB, Model of PC Utilization (MPCU), Motivational Model (MM), Social Cognitive Theory (CST) and Innovation Diffusion Theory (IDT) (Attuquayefio & Addo, 2014). These combinations of some models were applied in some situations and extended with additional factors. In 2003, Venkatesh combined all these eight models and developed the UTAUT model, and the application of this model explains seventy percent of the variation in technology adoption (Venkatesh, 2003).

Since its inception, the model has been widely used to explain system usage and technological adoption. However, recent researchers have applied UTAUT successfully in explaining satisfaction and behavioral outcomes (Kabra et al., 2017; Chao, 2019; Wang et al., 2021). User satisfaction must be considered when determining the technology usage and measuring the success of technology implementation (Isaac et al., 2019). Monstesdioca and

Macada (2015) highlighted that UTAUT could be applied to investigate the outcome or success in technology adoption, such as user satisfaction. Bhatt & Nagar (2021) used the model empirically to explain mobile banking users' satisfaction. Although this model elucidates satisfaction towards technologies and information systems quite effectively, several researchers have found that the variables may be too general and thus recommended that the independent variables can be more context-specific to enhance the model's efficacy (Ammenwerth, 2019; Wang et al., 2021).

UTAUT combines elements at the individual (performance expectancy and effort expectancy), organizational (facilitating conditions), and social (social influence) levels (Isaac et al., 2019). The first element of UTAUT is performance expectancy, which is often believed that the technology could perform and satisfy the users' intended objectives (Venkatesh et al., 2003). In this study, performance expectancy is prescribed as the expectations of university students towards the usefulness of the online learning materials used to meet their learning needs in the online platform. According to Gopal et al. (2021), the usefulness of the online materials as part of the course design is a significant predictor of satisfaction with online learning platforms, especially during the pandemic.

The next element is facilitating conditions, which is described as the extent of the existence of infrastructure that supports them (Venkatesh, 2003). In online learning, the network infrastructure is vital to ensure a seamless experience. Hence, in this study, facilitating conditions are referred to as network stability.

Effort expectancy is another construct of the UTAUT model, which measures the ease of information technology use at all levels of technology adoption (Venkatesh, 2003). The ease of using a system or its usability will determine if the users encounter any difficulties or challenges in using the platform. As such, online platforms that are highly complicated would most likely cause feelings of frustration and dissatisfaction among the users (Al-Azawei & Lundqvist, 2015). While the lower effort required reflects higher usability of the system, which could lead to student satisfaction (Abbad, 2021). Thus, in this study, the effort expectancy is equated to the usability of the e-learning platforms.

Lastly, social influence is the final element in the UTAUT model. Social influence is the extent to which users believe that their social circle is important enough to influence their behavior towards the new system (Al-Azawei & Lundqvist, 2015). Ozturk (2021) found that students look forward to connecting with friends and peers during the pandemic. Moreover, Wart et al. (2020) echoed that social presence, quality of social interaction, and group collaboration are essential in influencing students' satisfaction with online learning. Hence, this study prescribes the social influence as peers' interaction.

The usefulness of online materials

Performance expectancy is the level at which the individual believes that using the technology would be useful or helpful in attaining certain benefits (Dwivedi et al., 2021). Hence, in this study, the term "usefulness" is applied to reflect performance expectancy. Online learning materials are the primary resources to guide and enhance students' learning

process. Their quality often influences students' academic performance and satisfaction with the online system (Dowell & Small, 2011). Adopting various teaching and learning modules has become more effective in flexibility and accessibility by not setting any boundaries in terms of time, place, and channel (Chintalapati & Daruri, 2017). Based on Myung et al. (2011), performance expectancy is the individual's view of the usefulness of technology, including information quality, content, and reliability. Since e-learning is unavoidable during the pandemic, this has driven access to better and more flexible teaching resources (Qiao et al., 2021).

It was found that satisfied students appeared to be more engaged, motivated, and responsive if online learning provides a presence of cognitive, teaching, and social engagement through helpful teaching resources (Richardson & North, 2020). For instance, Wilcox and Vignant (2020) identified synchronous and asynchronous videos are effective modes of online materials. Although there is no difference in the effectiveness of the learning environments, the quality of online materials was the determining factor in students' satisfaction with a course (Olson et al., 2020). There are various techniques to deliver the lessons using interactive formats. Still, the presentation of the content delivery is an essential factor in determining students' satisfaction with ERT, especially among undergraduate students who tend to rely heavily on materials provided by the instructors (Brodsky et al., 2021). Hence, the higher students perceive the usefulness of the online materials provided, their satisfaction increases. Therefore, based on the above discussion, the below hypothesis is proposed:

Hypothesis 1: The usefulness of online materials has a significant influence on the undergraduate students' satisfaction with emergency remote teaching (ERT)

Network Stability

Network stability is crucial in facilitating the learning process without disruptions. Facilitating conditions refer to the consumers' perceptions of the resources and support available to perform a behavior by the users (Attuquayefio & Addo, 2014). In this study, the facilitating conditions of the UTAUT model will be referred to as the network stability that the prominent providers in the country provide. Ten to twelve large Internet service providers dominate the Internet network worldwide. Telekom Malaysia Berhad TM is the largest Malaysia telecommunication provider with a market share of 85.79% of broadband consumption (Asia Nikkei, 2021). Among the other network providers in Malaysia are Maxis, Umobile, Time, and Yeoh Tiong Lay Corporation Berhad (YTL). However, it was found that Telekom Malaysia has the highest rate of customer complaints (Chen et al., 2011). These national and international providers are the leading network providers responsible for most routes and bandwidth stability in all countries. Routing instability explains the changes in network reachability resulting in configuration errors, transient physical and data link problems, and software bugs that could affect user satisfaction with broadband services (Teoh et al., 2022). An extreme increase in routing instability led to the loss of internal connectivity in wide-area, national networks that interrupted the learning process (Shim & Lee, 2020). Internet accessibility determines the network connectivity that determines whether the network services are available and stable (Gyongyosi & Imre, 2020). Basic

internet facilities are crucial to enable seamless access to online materials and learning (Rajadurai et al., 2018). Self-efficacy during online learning environments in higher education focuses on technological aspects such as the internet, computer self-efficacy, and web use efficacy (Alqurashi, 2019). Ismail et al. (2020) found that among the challenges students encounter are smooth access to the internet and the availability of suitable electronic devices that may impact their satisfaction with ERT.

Based on the Internet Users Survey (2018) conducted by the Malaysian Communications and Multimedia Commission (MCMC), a vast digital gap still exists between urban and rural users; 70% of internet users are from urban areas. Students located in less central areas may face limited or slower internet access. Smooth internet connectivity is essential for online learning as the e-learning platforms may use a variety of software that requires high broadband to download without lagging (Sun & Chen, 2016). Increased network stability ensures ERT is conducted effectively (Dhull & Sakshi, 2017). Thus, students with access to a stable high-speed network or mobile connectivity are more likely to be more satisfied as they have higher engagement rates in the teaching and learning platforms (Li & Tsai, 2017). Thus, the hypothesis is drawn as below:

Hypothesis 2: Network stability significantly influences the undergraduate students' satisfaction with emergency remote teaching (ERT)

Usability of e-learning platforms

The third element in UTAUT is effort expectancy, which is operationalized in this study as the extent of usability of the technology implemented in ERT. Effort expectancy also explains that there are relationships between the effort, the achieved performance, and the rewards associated with using the technology (Onaolapo & Oyewole, 2018). The developer of the LMS systems mainly contributes to the usability of the e-learning platform in this study. Developers from higher institutions designed the software using the current technology that can cater to students' teaching and learning feasibility. Users should also learn the system provided so they can follow the lessons conducted by utilizing all services incorporated in the system.

Hence, e-learning platforms, or learning management systems (LMS), are designed to facilitate the teaching and learning process in private and public education institutions. A proper e-learning system should be accessible, reliable, flexible, stable, and easy to use to effectively deliver and enhance the students' learning experience (Al-rahmi et al., 2015). E-learning platforms are often assessed based on their technical quality, service quality, context, learners, and also instructors' perspectives of it (Raspopovic & Jankulovic, 2017). According to Mohd Johari & Ismail (2011), based on a study conducted in Penang, e-learning systems that facilitate online learning need to be further improved to become friendlier and more efficient regarding resource availability. The current platforms in some Penang institutions still lack quality, collaboration, contextualization, and active learning criteria.

In another study by Ismail et al. (2010), it was found that flexibility and conveniences are the crucial elements in online learning platforms and contribute to the delay in response. According to Kumarasamy et al. (2020), the reduction of face-to-face time, learners' motivation, readiness, and quality of the academics' skills and capabilities are found to be lacking in blended learning mode and depend on an effective online platform to reduce these challenges. Thus, students' satisfaction is expected to improve if the e-learning platform enables them to not only learn but helps to reinforce and enhance their knowledge anytime, anywhere (Mohebbi, 2020). Therefore, the hypothesis is proposed as below:

Hypothesis 3: Usability of the e-learning platforms significantly influences the undergraduate students' satisfaction with the emergency remote teaching (ERT)

Peers' Interaction

According to the modified UTAUT model in Myung et al. (2011), peer pressure is a form of social influence that facilitates new technology usage. Social influence is a newly added exogenous factor to the UTAUT model that comprises the students' social circle and influences from peers (Qiao et al., 2021). Besides peer pressure, social influence includes social space, social identity, and social support, which were all found to influence learning satisfaction (Alenezi, 2022). Moreover, social influence from peers is proven to be more significant, especially in higher power distance countries (Myung et al. 2011). A past study found that interactions with their instructors and peers are essential during online learning as it contributes to self-confidence (Watts, 2019). Furthermore, their attitude towards group interaction and collaboration is one of the critical factors in predicting satisfaction, and it serves as an essential soft skill in career advancement (Wengrowicz et al. 2018).

The satisfaction with online learning is dependent on continuous communication and the opportunity to be connected in a collaborative manner (Bickle & Rucker, 2017). Online social presence and peer interaction will improve their motivation, participation, satisfaction, and retention during online learning (Richardson et al., 2017). The provision of group online learning methodologies through group discussions, group assignments, and research projects serves as a platform for academic performance (Duncan, 2018). Overall, peer support and consistent communication enhance the students' learning process (Aderibigbe et al., 2021). Based on the above discussions, below is the proposed hypothesis:

Hypothesis 4: Peers interaction has a significant influence on the undergraduate students' satisfaction with the emergency remote teaching (ERT)

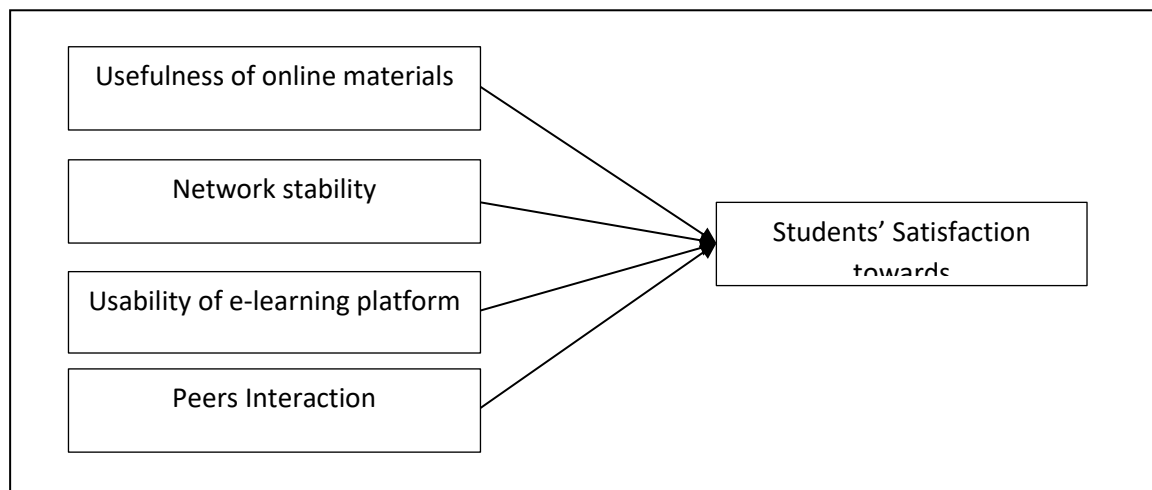


Figure 1: Conceptual framework

Methodology

This is a quantitative-based correlation research design. The investigation is quantitative as the questionnaires are distributed among the respondents. The analysis is focused on establishing the existence or non–the presence of a relationship between the usefulness of online materials, network stability, the usability of e-learning platforms, and peers' interaction. The quantitative approach delivers orderly data collection procedures and analysis to achieve the research objectives (Zikmund et al., 2013). Descriptive analysis can give a clearer impression using numerical data on the researched situation (Weil, 2017). This research method could focus on detailed scenarios of the problems, people, or even incidents of the current state (Rahi, 2017). Structured questions are formed through the questionnaires to collect the data from the target population (Fellows & Liu, 2015). The time horizon of the study is cross-sectional as the data from the questionnaires are only collected once at a specific time from respondents with different undergraduate programs available from all the various private higher institutions in Penang.

Sampling Design

The unit of analysis used for this research is undergraduates from the private higher institutions currently pursuing their undergraduate programs. Research study places the population group as a research target to survey is a sampling design (Hitzig, 2004). The sampling plan for this research is based on a non – probability sampling procedure whereby the questionnaires will be distributed to the selected samples in Penang. It is based on a subjective judgment of the researcher rather than random selection. Convenience sampling is applied whereby students are specified in the various private higher institutions currently pursuing their foundation or A-Level, Diploma, and Bachelor's Degree programs.

The total population in Penang last year was about 1.76 million (Department of Statistics, 2020), while the targeted population of higher education students in Penang was estimated at around 255,000 in 2020 (Penang Monthly, 2021). Due to the exact unknown population of total undergraduate students in Penang currently, it is assumed that the minimum sample

size required is 384, according to Krejcie and Morgan (1970). Thus, 510 questionnaires were distributed to achieve the target response return.

Questionnaire Design

Questionnaires are used to collect data from respondents, which vary between the descriptive and the explanatory data for analysis and derivation of the findings (Saunders et al. 2016). The arrangement of the questionnaire is divided into parts A, B, and C. As for this Part A, participants will be required to provide relevant demographic details which are significant to this research, especially regarding online learning. The required data are gender, age group, education level, and the location of studies. In this Part B, participants would be requested to provide feedback associated with the dependent variable, which is about the students' satisfaction with the emergency remote teaching (ERT) in private institutions in Penang for undergraduates' programs. The statements measuring satisfaction were adapted from Habel et al. (2016). In Part C, participants are requested to provide feedback on the independent variables about reasons contributing to the students' satisfaction with emergency remote teaching (ERT) in private higher institutions in Penang. Dowell & Small (2011) adapted questions to measure the usefulness of online materials, while the questions for network stability and usability of e-learning platforms were adapted from Gyongyosi & Imre (2020). This study also adopted statements from Myung et al. (2011) and Abbad (2021) to measure peers' interaction. Five-point Likert scale is used except for nominal data questions related to the respondent's demographic profile and according to Rahi (2017).

Pilot Test

In any population research, the pilot study comes first before the more extensive actual study. A pilot study minimizes the probability of failure by testing the reliability of techniques, methods, questionnaires, and interviews, besides ethical and practical issues that could interfere with the study (Doody & Doody, 2015). According to Creswell and Creswell (2017), approximately 10% of the proposed sample size is recommended for the pilot test, and referring to the sample size of 510, the number of respondents for the pilot test would be 50. Data collection from respondents in this pilot test would then be used for the Factor Analysis and Reliability test to see the complete analysis.

Data Analysis

Hypothesis testing is done to decide the extent of model fit of the study with the focus on the framework. The goodness of fit, R-Square, should be more than 0.5 for the construct to predict or influence the phenomenon of the study. If the R square is less than 0.5, the conceptual framework is not fit (Gilleland et al., 2018). The construct was found not to have any predicting power or influence on the phenomenon of the study. There might be other factors that influence the phenomenon of the study which may not be included in the study. Multiple Regression analysis tests the association between the independent and dependent variables, and R² is the coefficient of determinant that predicts the model's goodness of fit with the value of more than 0.5, or else the model is unfit for the research (Sekaran & Bougie, 2016).

Results and Discussion

In this research, 510 responses were collected. Out of these 510 responses, only 504 were usable, and the six were not usable because those respondents were not from Penang. However, the number of valid responses was adequate to perform further analysis as the minimum sample size for a population exceeding 1 million people, per Krejcie and Morgan (1970), is only 384. Hence, the 504 data sets collected are sufficient for this study.

Demographic Profile of Respondents

The total number of respondents who participated and were used for data analysis is 504, of which 63.4% (256) are female, and 36.6% (148) are male. There are only two categories of age used to collect the data, which are from 18 – 21 years old and 22 – 30 years old because these are the category of respondents who are currently pursuing undergraduate programs. 64.1% (259) of respondents are from 18 to 21 years old, and 35.9% (145) are from 22 to 30 years old. Levels of education are categorized into foundation or A-Level programs, Diploma, and Bachelor's Degree because this study focused only on undergraduate programs. The highest accumulation of respondents is from Bachelor's Degree which is 40.1% (162) and followed by foundation or A-Levels at 32.4% (131) and lastly from Diploma which is 27.5% (111). The total respondents of 504 are all from Penang because those outside Penang were filtered out due to the requirement of this research.

Table 1: Respondents' demographic profiles

Information	Number of Responses	%
<u>Gender</u>		
Male	148	36.6%
Female	256	63.4%
	504	100.00%
<u>Age Group</u>		
18 – 21 years	259	64.1%
22 – 30 years	145	35.9%
	504	100.00%
<u>Level of Education</u>		
Foundation or A - Levels	131	32.4%
Diploma	111	27.5%
Bachelor's Degree	162	40.1%
	504	100.00%
<u>Location of Education</u>		
Penang	504	100%
	504	100.00%

Results of Reliability Analysis & Factor Analysis

Based on the results in Table 2.0 below, the Cronbach's alpha values for each variable are more significant than 0.70. The network stability has the highest Cronbach's Alpha value of

0.776, while the peers' interactions have the lowest value at 0.712. The reliability values of independent and dependent variables are accepted to proceed further with other analyses. As for the factor analysis results, the overall KMO sampling adequacy shown is 0.761, the significant value is $<.001$, and the KMO of the dependent variable is 0.677. Among the questions designed for the dependent variable, SS3 has the lowest factor loading, 0.652. SS4 and SS5 have the highest factor loading of 0.943. As the KMO value is more significant than 0.6, the value is acceptable and falls under 'Medium', indicating the dependent variable's relevancy in this study (Howard, 2016). On communalities value, all items have a factor loading greater than 0.5. According to Mooi et al. (2018), all the factor loading with the given factor must be above the acceptable level of 0.50. Overall KMO value is at 0.811, and since the value is more significant than 0.6, this is deemed satisfactory sampling adequacy (Howard, 2016). Hence, further inferential analyses are conducted.

Table 2: Reliability Test Result

Variable	Cronbach's Alpha	Number of Items
<u>Dependent Variable</u>		
Perceived satisfaction	0.767	5
<u>Independent Variables</u>		
Usefulness of online materials	0.741	5
Network stability	0.776	5
Usability of e – learning platforms	0.732	5
Peers interactions	0.712	5

Table 3: KMO and Bartlett's Test Result

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.761
Bartlett's Test of Sphericity	Approx. Chi-Square	452.781
	df	10
	Sig.	$<.001$

Table 4: Factor Loading Result (for Dependent Variable)

No.	Questions	Factor Loading
SS1	I am satisfied with the current course management system used by my institutions.	0.792
SS2	I am satisfied with the technologies used (live streaming, recorded videos, audio materials) by my facilitators from my institutions.	0.741
SS3	If I had a choice, I would choose online learning over the face – to – face classes.	0.652
SS4	Overall, the online courses conducted by my institutions have effectively presented the desired learning outcomes.	0.943
SS5	Overall, the online courses conducted by my institutions have effectively presented the desired learning outcomes.	0.943

KMO: 0.677 Bartlett’s Test of Sphericity – p-value $0.000 < 0.001$

Table 5: Factor Loading Result (for Independent Variables)

No.	Questions	Factor Loading
EFF1	The learning materials are well–organized in the course management system.	0.534
EFF2	I can easily access all the learning materials anytime.	0.734
EFF3	The learning materials prepared can fulfill the needs of my studies.	0.700
EFF4	I can understand the information provided with minimal guidance from my instructors.	0.742
EFF5	Instructors have provided sufficient and informative learning materials.	0.749
KMO: 0.787	Bartlett’s Test of Sphericity – p-value 0.000 < 0.001	
INT1	The internet connectivity is fast and enables me to follow the online courses smoothly.	0.864
INT2	I can participate in live streaming during my online lectures.	0.618
INT3	I can always download all the files or videos uploaded in my courses.	0.957
INT4	I can complete my assessments in time, even with time constraints.	0.659
INT5	The current internet stability enables me to complete the course online until the situation is back to normal.	0.967
KMO: 0.782	Bartlett’s Test of Sphericity – p-value 0.000 < 0.000	
EL1	Various media and digital tools instructors use to make online learning more exciting.	0.615
EL2	The real-time learning session through live streams is helpful for me to learn online.	0.617
EL3	The new online teaching method implemented by my institution is user–friendly.	0.791
EL4	I can reach out to my instructors and receive assistance on technical difficulties accessing course materials.	0.807
EL5	I receive help with problems related to the information systems from the institution's IT department.	0.770
KMO: 0.810	Bartlett’s Test of Sphericity – p-value 0.000 < 0.001	
PEER1	I learn through my interactions during the participation in group discussions	0.775
PEER2	I like the flexibility of online communication with my peers and instructors	0.572
PEER3	I feel comfortable communicating and collaborating online with my peers.	0.684
PEER4	I believe that online communication has made the learning process more effective than a regular face–to–face class.	0.664
PEER5	The course management system designed by my institutions enables me to interact and collaborate with my peers effectively.	0.698
KMO: 0.811	Bartlett’s Test of Sphericity – p-value 0.000 < 0.001	

Results of Inferential Analysis

Table 6.0 below shows the model summary of the multiple regression analysis. In this regression, the predictor variables are the effectiveness of online materials, internet stability, e-learning platforms, and peers' interactions and collaborations. These predictors are required to estimate the students' satisfaction with online learning. As per the table, the R-value, or the multiple correlation coefficient, has a value of 0.535, showing a good level of prediction. The multiple regression model has an adjusted R square value of 0.286. This indicates that the independent variables in this research explain 28.6% of the variability of the dependent variable. Per Sekaran and Bougie (2016), the remaining 72% variation could not be explained by the predictors and is explainable using factors that have not been studied in this research. This is addressed in the limitations. R square is not an absolute measure for the goodness of fit; it is just a relative measure to explain the variance relative to the total variance in the dependent variable (Mayer, 1975).

Table 6: Result of Multiple Regression Model

Model	R	R Square	Adjusted R Square	Std. An error in the Estimate	Durbin-Watson
1	.535 ^a	.286	.281	.60563	1.843

a. Predictors: (Constant), PEER, EL, INT, EFF

b. Dependent Variable: SS

Results from table 7.0 below show the study shows that the independent variable of the usefulness of online materials has the highest coefficient beta value (0.533) and p-value of <.001. The usability of the e-learning platform followed this, showing a coefficient of beta value (0.73) and p-value of <.001. These two variables are significant to students' satisfaction as $p < 0.05$ is the cut-off that indicates the statistical significance as per the rule of the thumb (Sekaran and Bougie, 2016). Stability of the network with the beta coefficients of beta value (0.41) with a p-value at .293 and peer interactions with coefficient beta value at (0.25) with a p-value of 0.515 are not significant towards the students' satisfaction. Equation of Regression Line is Y (Student satisfaction) = $0.666 + 0.533 \text{ EFF} + 0.073 \text{ EL} + 0.353$. This is an outcome that the usefulness of online materials and usability of e-learning platforms are significant towards the undergraduates' students' satisfaction with emergency remote teaching (ERT) in private higher institutions in Penang.

Table 7: Results of hypothesis testing

Hypotheses	Std Beta	t-value	p-value	Result
H1: Usefulness of online materials □ students' satisfaction	0.842	13.567	0.001	Accepted
H2: Network stability □ students' satisfaction	0.062	1.053	0.293	Rejected
H3: Usability of e-learning platforms □ students' satisfaction	0.129	1.904	0.001	Accepted
H4: Peers' interaction □ students satisfaction	-0.036	0.652	0.515	Rejected

Implications of Study

This study analyzed the effectiveness of ERT from students' perspectives by delineating the key factors contributing to students' satisfaction with the ERT. The role of ERT and the students' satisfaction with this teaching method during the COVID19 pandemic became clearer. According to Abdullah et al. (2022), the satisfaction of e-learners explained 68.3% of their preference for continuous remote learning mode. Although some higher education institutions have started implementing hybrid learning, it is essential to reflect on the experiences of ERT to be better ready for future changes. Moving forward, it is also observable that some of the institutions may decide to operate in a fully online mode. Hence, this study could contribute insights into students' responses and guide key improvement areas for institutions implementing remote teaching and learning. Despite the COVID19 being declared endemic in Malaysia, we cannot say for sure that there will not be any other pandemic or crisis that may arise in the future. Thus, this study must be conducted for us to learn the lessons and for higher education institutions, academicians, and government agencies like the Ministry of Higher Education to be more well-prepared.

This study concluded that the use of online materials and e-learning platforms' usability significantly influence undergraduate students' satisfaction with emergency remote teaching (ERT). The usefulness of the online materials significantly affects undergraduate students' satisfaction with emergency remote teaching (ERT) in private institutions in Penang. Similar to Myung et al. (2011) postulations, performance expectancy or one's perceived usefulness significantly impact its adoption. Hence, information and online materials should be helpful for the students, with suitable language usage and fulfilling their future career needs (Bielousova, 2017). According to Li and Tsai (2017), online materials that allow them to use annotation tools to review help increase their overall motivation and satisfaction in online learning. Thus, materials should be prepared adequately for students to gain attention and interest, including attractive teaching slides, audio, video, web-conferencing tools, and other forms of gamification simulations (Martin et al. 2019). According to Moore & Kearsley (2012), online learning materials that the students access can be presented in various formats such as text, pictures, infographics, video clips, and so on (Moore & Kearsley, 2012). The contents of the online materials that are provided in various media forms need to be engaging and support the students' learning outcomes of the course and program. Hence, the implications for the preparedness of the educators to spend more time ensuring the quality of the online learning materials should not be overlooked. Moreover, institutional policy should be put in place to have a periodic review to maintain the recency of the materials. Key industry players and subject matter experts can be invited to participate in this review process to ensure its relevance.

In terms of practical implications, higher education institutions are also expected to continue to invest in more advanced and efficient e-learning platforms to cater to the requirements of the online learning mode. In this study, the usability of e-learning platforms significantly influences undergraduate students' satisfaction with emergency remote teaching (ERT).

Among the e-learning platforms or learning management systems (LMS) designed for online learning are Moodle, Google Classroom, and Blackboard, which seek to provide users with compelling learning experiences (Rajadurai et al., 2018). Mobile-compatible E-learning platforms are also an effective strategy that is more user-friendly and essential to current learners as more students nowadays are connected to their mobile phones than conventional laptops or desktops. A user-friendly and powerful e-learning platform can provide access and convenience to the students, making their learning more enjoyable (Prasetyo et al., 2021). Besides the functions and features of the e-learning platforms, LMS developers should also look into how these functions can be synched rather than expecting students to use different platforms or download several apps for various parts. For example, some institutions require the students to download materials from Moodle and check plagiarism in a separate web-based Turnitin. An e-learning platform such as Blackboard with multiple functions will have an edge and give students an optimum and seamless user experience (Mahmud et al., 2021).

Although, in this study, it was discovered that the stability of the internet does not significantly influence undergraduate students' satisfaction with emergency remote teaching (ERT), one cannot deny that the instability of the internet may disrupt their overall learning experience. Under the Penang Connectivity Master Plan and Penang 2030 vision, the state government has mandatory all-new property development projects to provide fiber optic telecommunications infrastructure as an essential utility (Hussain, 2020). It became the first state in Malaysia to take a step in delivering high-quality and comprehensive digital infrastructure to bolster the digital economy and reduce the digital gap between urban and rural areas. Nonetheless, the digital divide remains a challenge in many other states in Malaysia. Furthermore, the deployment of 5G technology in Malaysia has been delayed and postponed to 2023 (New Straits Times, 2022). Hence, local municipalities should collaborate with network providers to ensure that the accessibility and speed of the internet are up to par. Perhaps, network instability and lack of functional IT infrastructures are more evident in under-developed countries (Aung & Khaing, 2016). Difficulty in focusing during online lessons occurs when there is poor connectivity, especially in areas with poor network availability (Desai et al., 2020). This study found that students in Penang did not face any difficulties related to network stability that could have influenced their satisfaction despite past studies which found otherwise (Hermanto et al., 2021; Zuo et al., 2021). Yet, this could still be a relevant factor depending on the students' geographical location.

The findings of this study implied that the influence of peer-to-peer interaction is not that important. In hindsight, this is important for educational institutions to monitor the form of interactions that happens continuously. Especially in dealing with millennial students born between 1982 and 2000 may have different perceptions towards interaction and collaborative learning (Harvey et al. 2017). Although the isolation problem faced by students during ERT did not turn out to be a significant influence on their overall satisfaction, there could be further reasons that require the university's attention. As this study was conducted almost a year into the pandemic, students may have accustomed themselves to the isolation and self-studying method. According to Saputra et al. (2021), students have adapted to the social distancing attitude and resume an autonomous learning style. Alternatively, some of these

learners may find these social bonds in other forms of their lives, such as online communities within their social network or gaming communities. Apart from ERT, they are likely to seek interaction and collaboration through other means or may have adapted to an independent and self-learning method.

Nonetheless, teachers' absence has impacted their learning satisfaction (Syaharuddin et al., 2021). In terms of online learning, past studies found that students' satisfaction is more likely influenced by the interaction between the instructor and the learners (Baber, 2020). Also, with the loss of conventional face-to-face learning, the implementation of ERT could have acted as a detractor on students' social awareness and socializing skills (Mumtaz et al., 2021). The lack of face-to-face interaction in the virtual platforms may have created a more severe and long-term impact on our future graduates. Thus, higher education institutions should nurture more personal interactions during the learning process between the instructor with students; and students with peers to have a positive impact on their overall online learning experience.

Conclusion and Recommendations

Identifying the key elements contributing to online learning satisfaction is crucial to increasing the likelihood of students using the various platforms. Hence, by applying the modified UTAUT model by Myung et al. (2011), this study was conducted to identify further these influential factors based on students' perceptions to improve ERT development during the crisis. This study concluded that the usefulness of the online materials has the most significant influence, followed by the usability of e-learning platforms among undergraduate students' satisfaction with emergency remote teaching (ERT), especially in private higher education institutions.

Elevating E-Learning Platforms

Because of the findings, it is recommended that ERT can be elevated through the usage of information and technology (ICT) during the pandemic lockdown (Hodges et al., 2020). As more students are gravitating toward learning online, the e-learning platforms should be multi-functional, flexible, up to date, handle different formats of content and provide a good user experience for both students and instructors.

Besides the role of lecturers, the management of higher education institutions plays an essential role in supporting the lecturers' delivery. This is by ensuring that an efficient e-learning management system is used to avoid over-burdening the lecturers and students with additional administrative and technical issues arising from e-learning platforms. Instead, higher education institutions should be willing to invest in providing interactive and practical e-learning platforms to ease the teaching and learning process. This is not an area that the management of educational institutions can skip on. One such local university in Malaysia requires its lecturers to download all the learning materials from the e-learning platform every semester to avoid paying for storage space. Indeed, this is a cumbersome and inefficient use of lecturers' time. Besides, a good e-learning platform provides various methods of expression and increases engagement (Labencik et al., 2015). Hence, a reliable

and user-friendly e-learning platform enables students and educators to learn and teach more effectively and efficiently.

Relevant Course Materials

Furthermore, course content and materials that are well designed depends on lecturers' preparedness to deliver it effectively in a virtual manner during the pandemic (Salleh & Azman, 2020). Besides preparing and uploading materials such as quizzes, videos, and pdf documents to achieve the relevant course learning outcome and program learning outcomes, lecturers are required to utilize the available functions and online resources optimally. The extensiveness of online materials was found to contribute to students' satisfaction. Hence educators need to improve their preparation by having clear lesson plans and being ready with recent and relevant teaching materials such as case studies, online games, and extra reading materials to assist students in their online studies. Educators now no longer play the role of facilitators but also as designers of their courses.

Understanding each student's learning style may be a useful guide for lecturers to determine what teaching materials are appropriate to enhance the students' satisfaction with the ERT experience. Apart from that, higher institutions should also provide relevant training for instructors and allocate sufficient time to attend webinars or courses that enhance their skills in materials preparation to support ERT (Montelongo, 2019). Ultimately, students' satisfaction highly depends on the interaction between instructors, technology, and the students themselves.

Encourage Personal Interactions

Interaction is vital in online learning to make the journey more compelling. Learners should be given equal opportunities to collaborate, share their ideas, and participate in intellectual discourse. Social skills are depleting due to online learning. Thus, it should be encouraged and cultivated as it helps learners build knowledge and empowers them to initiate communication with others. Some more passive students may be struggling in silence behind their screens. Central to this, some students may be facing social exclusion. According to Abid et al. (2021), students and educators were reported at risk of developing mental health problems, including depression. Some have tried to overcome this by seeking interactions on other platforms such as social media networks. However, different coping mechanism strategies that the higher education institutions suggest include implementing proper support groups and processes. In mitigating the stress issue, active peer support groups can be formed to forge a strong bond and balance their social and mental wellbeing.

The different learner types and their needs must be understood. Hence, it is the responsibility of the educators to play their role as a facilitator and foster more open communication during the online lessons. Educators must motivate their students to switch on their cameras and microphones to be fully immersed in the online discussions. Educators themselves should lead by example and slowly form this a norm in the class for everyone. Some might feel a little discomfort initially, but in the long run, the benefits of personal interactions outweigh the challenges. As the students' transition to becoming future job seekers, their confidence

levels will be elevated. However, many students have cited various reasons for not participating interactively during online classes (Ballena and Feranil, 2021). Some of the reasons include limited internet access and hardware problems. Thus, these issues should be addressed beforehand. Higher learning institutions are binding in providing relevant infrastructure, including seamless internet access in the surrounding campus area, to teach social skills and networking as this is a relevant employability skill.

Limitations and Future Studies

Nonetheless, this study has a limitation whereby it only focuses on undergraduate students in a specific locality. Although it involves students from across programs and a few institutions in that area, future studies can attempt to include other programs and increase the geographical coverage for cross-comparison purposes. Another limitation is the four variables identified based on the pre-pandemic theory, which may not have included all possible vital influencing factors. This limitation is reflected in the low R² value in this study, which could be due to the uncertainty that the pandemic brought. New factors may emerge that could not have been included when the research was conducted. Hence, it is also suggested that future studies can consist of a more extensive literature review and consider more recent underlying pandemic-related factors to have a better measure of their satisfaction, such as students' wellbeing, emotional and mental stress levels, excessive screen time, student-instructor interaction, student-support system interaction, home learning environment, quality and integrity of online assessment and students' self-preparedness amongst others.

References

Abbad, M. M. (2021). Using the UTAUT model to understand students' usage of e-learning systems in developing countries. *Education and Information Technologies*, 26(6), 7205-7224.

Abdullah, S.I.N.W., Arokiyasamy, K., Goh, S.L., Culas, A.J. & Manaf, N.M.A. (2022). University students' satisfaction and future outlook towards forced remote learning during a global pandemic. *Smart Learning Environments*, 9 (15), <https://doi.org/10.1186/s40561-022-00197-8>.

Aderibigbe, S. A., Maria Dias, J., & Abraham, M. S. (2021). Understanding issues affecting students' commitment to online discussion forums in undergraduate courses. *International Journal of Interactive Mobile Technologies*, 15(1), 4–21.

Aguilera-Hermida, P. (2020). College students' use and acceptance of emergency online learning due to Covid-19. *International Journal of Educational Research Open*. <https://www.sciencedirect.com/science/article/pii/S266637402030011X?via%3Dihub>

Al-Azawei, A., & Lundqvist, K. (2015). Learner differences in perceived satisfaction of online learning: An extension to the technology acceptance model in an Arabic sample. *Electronic Journal of E-Learning*, 13(5), 412-430.

Alenezi, A. R. (2022). Modeling the Social Factors Affecting Students' Satisfaction with Online Learning: A Structural Equation Modeling Approach. *Education Research International*. <https://doi.org/10.1155/2022/2594221>

Al-rahmi, W.M., Othman, M.S. & Yusuf, L.M., (2015). The effectiveness of e-learning in Malaysian Higher Education: A case study of Universiti Teknologi Malaysia'. *Mediterranean Journal of Social Sciences*. 6(2), 625-637.

Ammenwerth, E. (2019). Technology acceptance models in health informatics: TAM and UTAUT. *Stud Health Technol Inform*, 263, 64-71.

Aning, A. & Baharum, A. (2020). E-learning design in Malaysian Higher Educational Institutions: principles and guidelines. *Journal of Hunan University (Natural Sciences)*. 47 (10), https://scholar.googleusercontent.com/scholar?q=cache:J_F0EsNyjbAJ:scholar.google.com/+ELearning+Design+in+Malaysian+Higher+Educational+Institutions+:+Principles+and+Guidelines+aning&hl=en&as_sdt=0,5

Alqurashi, E. (2019). Predicting student satisfaction and perceived learning within online learning environments. *Open and Distance Learning Association of Australia, Inc.* 40 (1), 133-148

Asia Nikkei (2021). *Telekom Malaysia Bhd*. Accessed on 10 May 2022 from <https://asia.nikkei.com/Companies/Telekom-Malaysia-Bhd>.

Attuquayefio, S., & Addo, H. (2014). Using the UTAUT model to analyze students' ICT adoption. *International Journal of Education and Development using ICT*, 10(3).

Aung, T. N., & Khaing, S. S. (2016). Challenges of implementing e-learning in developing countries: A review. *Advances in Intelligent Systems and Computing*, 405–411.

Baber, H. (2020). Determinants of students' perceived learning outcome and satisfaction in Online Learning during the pandemic of COVID-19' *Journal of Education and e-Learning Research*. 7(3), 285-292. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3679489

Ballena, C. T., & Feranil, B. S. (2021). Remote learning amid a global crisis: A literature review. *Journal of Institutional Research South East Asia*. 19(2), http://www.seairweb.info/journal/articles/JIRSEA_v19_n02/JIRSEA_v19_n02_Article02.pdf

Bickle, M. C. and Rucker, R. D. (2017). Examination, of course, attributes that contribute to student satisfaction with online learning, *Journal of Consumer Satisfaction, Dissatisfaction & Complaining Behavior*, 30, 26–27.

Bielousova, R. (2017). Developing materials for English for specific purposes online course within the blended learning concept. *TEM Journal*, 6(3), 637–642.

Brinkely-Etzkorn, K. E. (2018) 'Learning to teach online: Measuring the influence of faculty development training on teaching effectiveness through a TRACK lens. *Internet and Higher Education*, 38, 28-35.

Brodsky, J. E., Brooks, P. J., Scimeca, D., Todorova, R., Galati, P., Batson, M., & Caulfield, M. (2021). Improving college students' fact-checking strategies through lateral reading instruction in a general education civics course. *Cognitive Research: Principles and Implications*, 6(1), 1-18.

Burde, D., Kapit-Spitalny, A., Wahl, R. & Guven, O. (2011). Education and Conflict Mitigation: What the aid workers say. <https://openscholar.ump.ac.za/bitstream/20.500.12714/361/3/Emergency-remote-teaching-in-higher-education-during-Covid-19-challenges-and-opportunities.pdf>

Chao, C. M. (2019). Factors determining the behavioral intention to use mobile learning: An application and extension of the UTAUT model. *Frontiers in psychology*, 10, 1652.

Chen, A., Zhang, H., Cai, W., Lan, K., & Wang, H. (2011, November). The causes of customer satisfaction in telecommunication service: an empirical study. In *2011 7th International Conference on Advanced Information Management and Service (ICIPM)* (pp. 129-132). IEEE.

Chintalapati, N., & Daruri, V. S. K. (2017). Examining the use of YouTube as a learning resource in higher education: Scale development and validation of TAM model. *Telematics and Informatics*, 34(6), 853-860.

Clayton, K. E., Blumberg, F. C., & Anthony, J. A. (2018). Linkages between course status, perceived course value, and students' preferences for traditional versus non-traditional learning environments. *Computers & Education*, 125, 175-181.

Creswell, J.W. and Creswell, J.D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. 5th ed. London, UK: SAGE.

Desai, D., Sen, S., Desai, S., Desai, R., & Dash, S. (2020). Assessment of online teaching as an adjunct to medical education in the backdrop of COVID-19 lockdown in a developing country - An online survey. *Indian Journal of Ophthalmology*, 68(11), 2399-2403. 2, https://doi.org/10.4103/ijo.IJO_2049_20.

Dhull, I. & Sakshi, MS. (2017). Online Learning. *International Education & Research Journal (IERJ)*, 3(8), 32-34.

Doody, O. and Doody, C. M. (2015). Conducting a pilot study: Case study of a novice researcher. *British Journal of Nursing*. 24(21), 1074-1078. <https://doi.org/10.12968/bjon.2015.24.21.1074>

Dowell, D. J. & Small, F. A. (2011). What is the impact of online resource materials on student self-learning strategies?', *Journal of Marketing Education*, 33(2), 140–148. <https://doi.org/10.1177/0273475311410846>

Duncan, L. (2018). The Transition from Face-to-Face to Online Learning: Maintaining an Engaging Experience, Brightspace Community. <https://community.brightspace.com/s/article/The-Transition-from-Face-to-Face-to-OnlineLearning-Maintaining-an-Engaging-Experience>

Dwivedi, Y. K., Rana, N. P., Tamilmani, K., & Raman, R. (2020). A meta-analysis based modified unified theory of acceptance and use of technology (meta-UTAUT): a review of emerging literature. *Current opinion in psychology*, 36, 13-18.

Dziuban, C., Moskal, P., Thompson, Kramer, J. Lauren, D., Hermsdorfer, G. and Andrea (2015). Student satisfaction with online learning: Is it a psychological contract?' *Online Learning*, 19. <https://eric.ed.gov/?id=EJ1062943>

Embi, M.A. & Adun, M.N. (2011). E-Pembelajaran di IPTA Malaysia. Klang: Kementerian Pengajian Tinggi Malaysia. http://library.oum.edu.my/oumlib/sites/default/files/file_attachments/odl-resources/386270/prof-amin-full-paper.pdf

Embi, M.A. (2011). E-Learning in Malaysia Higher Education Institutions: Status, Trends & Challenges. Department of Higher Education, Ministry of Higher Education. <http://www.ukm.my/ctl/wp-content/uploads/2014/08/e-learning-in-Malaysian-Higher-Education-Institutions.pdf>

Fellows, R. and Liu, A. (2015). *Research Methods for Construction*. 4th ed. S.I.:Wiley Blackwell.

Gilleland, E., Hering, A. S., Fowler, T. L., & Brown, B. G. (2018). Testing the tests: what are the impacts of incorrect assumptions when applying confidence intervals or hypothesis tests to compare competing forecasts?' *Monthly Weather Review*, 146(6), 1685–1703.

- Gillis, A. & Krull, L.M. (2020). COVID-19 remote learning transition in Spring 2020: Class structures, student perceptions, and inequality in college courses' *Teaching Sociology*, <https://journals.sagepub.com/doi/full/10.1177/0092055X20954263>
- Gopal, R., Singh, V., & Aggarwal, A. (2021). Impact of online classes on the satisfaction and performance of students during the pandemic period of COVID 19. *Education and Information Technologies*, 26(6), 6923-6947.
- Güngör, H. (2007). *Emotional Satisfaction of Customer Contacts*. Amsterdam University Press, Amsterdam.
- Gyongyosi, L. & Imre, S. (2020). Entanglement accessibility measures for the quantum Internet'. *Quantum Information Processing*. 19(4), pp. 1–28.
- Harvey, H. L., Parahoo, S. & Santally, M. (2017). Should gender differences be considered when assessing student satisfaction in the online learning environment for millennials? *Higher Education Quarterly*, 71(2), 141–158.
- Hermanto, Y. B., & Srimulyani, V. A. (2021). The challenges of online learning during the covid-19 pandemic. *Jurnal Pendidikan Dan Pengajaran*, 54(1), 46-57.
- Hitzig, N.B. (2004). Elements of Sampling: The Population, the Frame, and the Sampling Unit. *The CPA Journal*, 74(11), 30-33.
- Hodges, C., Moore, S., Lockee, B., Trust, T. & Bond, A. (2020). The difference between emergency remote teaching and online learning, *Educause Review*. [http://www.cetla.howard.edu/workshops/docs/The%20Difference%20Between%20Emergency%20Remote%20Teaching%20and%20Online%20Learning%20_%20EDUCAUSE%20\(2\).pdf](http://www.cetla.howard.edu/workshops/docs/The%20Difference%20Between%20Emergency%20Remote%20Teaching%20and%20Online%20Learning%20_%20EDUCAUSE%20(2).pdf)
- Howard, M.C. (2016). A review of exploratory factor analysis decision and overview of current practices: What we are doing and how can we improve?, *International Journal of Human-Computer Interaction*. <https://doi.org/10.1080/10447318.2015.1087664>
- Hussain, N. (2020). *Internet as utility in Penang: A tentative step in the right direction*. Malaysiakini. <https://www.malaysiakini.com/letters/556258>.
- Igbokwe, I. C., Okeke-James, N. J., Anyanwu, A. N., & Eli-Chukwu, N. C. (2020). Managing the challenges to the effective utilization of e-learning as a response in COVID-19 Nigeria. *International Studies in Educational Administration (Commonwealth Council for Educational Administration & Management (CCEAM))*, 48(2), 28–34.
- Isaac, O., Abdullah, Z., Aldholay, A. H., & Ameen, A. A. (2019). Antecedents and outcomes of internet usage within organizations in Yemen: An extension of the Unified Theory of Acceptance and Use of Technology (UTAUT) model. *Asia Pacific Management Review*, 24(4), 335-354.
- Ismail, I., Mohd Johari, S.S. & Idrus R.M. (2010). Technical Appliance in e-learning: students' perception on the usage of online learning, *International Journal of Emerging Technologies in Learning (IJET)*, 5(2), 31-35.

- Ismail S., Ariffin, H.S., Abdullah, Z.H (2020). Issues and challenges in online teaching and learning during Movement Control Order (MCO). *INTI Journal*, 30. http://eprints.intimal.edu.my/1445/1/vol.2020_030.pdf
- Kabra, G., Ramesh, A., Akhtar, P., and Dash, M. K. (2017). Understanding behavioral intention to use information technology: insights from humanitarian practitioners. *Telematics Inform.* 34, 1250–1261. doi: 10.1016/j.tele.2017.05.010
- Krejcie, R.V. and Morgan, D.W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*. <https://journals.sagepub.com/doi/abs/10.1177/001316447003000308?journalCode=epma>
- Kumarasamy, K., Kalimuthu, K. & Narayanasamy, M. (2020). Perceptions of blended learning in higher education among academics and learners in SEGi College Penang, Malaysia – A case study. <https://journals.gre.ac.uk/index.php/compass/article/view/1061>
- Li, L.-Y., & Tsai, C.-C. (2017). Accessing online learning material: Quantitative behavior patterns and their effects on motivation and learning performance. *Computers & Education*, 114, 286–297.
- Mahmud, M. E., Widat, F., & Fuadi, A. (2021). Learning Management System in Streamlining Learning through Seamless Learning Approach. *AL-ISHLAH: Jurnal Pendidikan*, 13(2), 874-884.
- Malaysian Communications and Multimedia Commission (2018). *Internet Users Survey 2018: Statistical Brief Number Twenty-Three*. Cyberjaya: Selangor Darul Ehsan.
- Martin, F., Budhrani, K., & Wang, C. (2019). Examining faculty perception of their readiness to teach online. *Online Learning Journal*, 23(3), 97–119.
- Mayer, T. (1975). Selecting economic hypotheses by goodness of fit. *Economic Journal*, 85, 877–883.
- Moaward, R. A. (2020). Online learning during the COVID-19 pandemic and academic stress in university students. *Romanian Journal for Multidimensional Education / Revista Romaneasca Pentru Educatie Multidimensionala*, 12, 100–107.
- Mohd Johari, S.S. & Ismail, I. (2011). The effectiveness of e-learning portal in distance education as perceived by students in Universiti Sains Malaysia. *Malaysian Journal of Distance Education* 13 (1), 47-57.
- Mohebbi, E. (2020). Reinforcing Spreadsheet Skills through an Online Instructional Platform When Teaching a Face-To-Face Mis Course'. *Proceedings for the Northeast Region Decision Sciences Institute (NEDSI)*, 903–908.
- Montelongo, R. (2019). Less than/more than Issues associated with high-impact online teaching and learning. *Administrative Issues Journal: Education, Practice & Research*, 9(1), 68–79.
- Mooi, E., Sarstedt, M. & Mooi –Reci, I. (2017). Principal component and factor analysis. https://link.springer.com/chapter/10.1007/978-981-10-5218-7_8

Moore, J. C. (2005). *The Sloan consortium quality framework and the five pillars*. Newburyport, MA: The Sloan Consortium

Mumtaz, N., Saqulain, G., & Mumtaz, N. (2021). Online Academics in Pakistan: COVID-19 and Beyond. *Pakistan Journal of Medical Sciences*, 37(1), 283–287. <https://doi.org/10.12669/pjms.37.1.2894>

Myung, S.K., Ii, I., and Seongtae, H. (2011). An international comparison of technology adoption: Testing the UTAUT Model, *Information & Management Journal*, 48(1). <https://www.sciencedirect.com/science/article/abs/pii/S0378720610000716>

Narayanan, B. & Selvanathan, S. (2017). Online Education: It's implication towards undergraduate students' at private higher learning institutions and the Malaysian education system from educator Perspectives. *Journal of Global Business and Social Entrepreneurship (GBSE)*, 1(2), 84-92.

New Straits Times (2022). *Telcos-backed model to delay 5G execution, cause excess capacity and cost more: Digital Nasional*. <https://www.nst.com.my/business/2022/01/765917/telcos-backed-model-delay-5g-execution-cause-excess-capacity-and-cost-more>

Olsen J.K, Faucon, L. & Dillenbourg, P. (2020). Transferring interactive activities in large lectures from face-to-face to online settings, *Information, and Learning Sciences*, 12, 559-567. <https://www.emerald.com/insight/content/doi/10.1108/ILS-04-2020-0109/full/html>

Onaolapo, S., & Oyewole, O. (2018). Performance expectancy, effort expectancy, and facilitating conditions as factors influencing smartphone use for mobile learning by postgraduate students of the University of Ibadan, Nigeria. *Interdisciplinary Journal of e-Skills and Lifelong Learning*, 14(1), 95-115.

Öztürk, M. (2021). Asynchronous online learning experiences of students in the pandemic process: Facilities, challenges, suggestions. *Turkish Online Journal of Qualitative Inquiry*, 12(2), 173-200.

Penang Monthly (2021). *Total intake, enrolment, and output of colleges in Penang*. Accessed 10 May 2022 from <https://penangmonthly.com/article/20402/tvet-in-numbers?fbclid=IwAR2uNBFxEqG3jDJl81NpDbWO2zPNbjOdGZqObhzAdvIJHyA9TJ-M-QKUHx4>

Qiao, P., Zhu, X., Guo, Y., Sun, Y., & Qin, C. (2021). The development and adoption of online learning in pre-and post-COVID-19: Combination of technological system evolution theory and unified theory of acceptance and use of technology. *Journal of Risk and Financial Management*, 14(4), 162.

Prasetyo, Y. T., Ong, A. K. S., Concepcion, G. K. F., Navata, F. M. B., Robles, R. A. V., Tomagos, I. J. T. & Redi, A. A. N. P. (2021). Determining factors Affecting acceptance of e-learning platforms during the COVID-19 pandemic: Integrating Extended technology Acceptance model and DeLone & Mclean is success model. *Sustainability*, 13(15), 8365.

- Rahim, A., Ali, S., Ali, S., & Fayyaz, H. (2020). Online Education during Covid -19 pandemic; an experience of Riphah International University Faculty of Health and Medical Sciences. *Pakistan Armed Forces Medical Journal*, 506–512.
- Rajadurai, J., Alias N., Jaaffar A.M., & Hanafi, W.N.A. (2018). Learners' satisfaction and academic performance in Open and Distance Learning (ODL) universities in Malaysia. *Global Business & Management Research*, 10(3), 511–523.
- Rahi, S. (2017). Research Design and Methods: A systematic review of research paradigms, sampling issues, and instruments development. *International Journal of Economics and Management Sciences*, 6(2), 1-5.
- Raspopovic, M., & Jankulovic, A. (2017). Performance measurement of e-learning using student satisfaction analysis. *Information Systems Frontiers*, 19(4), 869–880.
- Richardson, J. C., Maeda, Y., Jing, L.V., & Caskurlu, S. (2017). Social presence in relation to students' satisfaction and learning in the online environment: *A meta-analysis*. *Computers in Human Behavior*, 71, 402–417. <https://doi.org/10.1016/j.chb.2017.02.001>
- Richardson, R., & North, M. (2020). Transition and migration to an online learning environment. *International Management Review*, 16(2), 5–28.
- Salleh, S. M., & Azman, N. A. N. N. (2020). Lecturer POV: moving toward virtual learning. *Global Business & Management Research*, 12(4), 24–33.
- Saunders, M., Lewis, P. & Thornhill, A. (2016). *Research methods for business students*. 7th eds. Harlow: Pearson Education Limited.
- Sekaran, U. & Bougie, R. (2016). *Research methods for business: a skill-building approach*. 7th ed. Haddington: John Wiley and Sons.
- Selvaraj, G., Anbalagan, K. & Azlin, M.N. (2014). Current trends in Malaysian higher education and the effect on education policy and practice: An Overview. *International Journal of Higher Education*, 3, 85-93. <https://eric.ed.gov/?id=EJ1067468>
- Saputra, N., Hikmah, N., Saputra, M., Wahab, A., & Junaedi, J. (2021). Implementation of online learning using online media during the Covid 19 Pandemic. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences*, 4(2), 1802-1808.
- Sintema, E.J. (2020). Effect of COVID-19 on the performance of grade 12 students: implications for STEM education. *EURASIA Journal of Mathematics, Science and Technology Education*, 16 (7).
- Shim, T. E., & Lee, S. Y. (2020). College students' experience of emergency remote teaching due to COVID-19. *Children and youth services review*, 119, 105578.
- Sun, A., & Chen, X. (2016). Online education and its effective practice: A research review. *Journal of Information Technology Education: Research*, 15, 157-190.

Syharuddin, S., Mutiani, M., Handy, M. R. N., Abbas, E. W., & Jumriani, J. (2021). Building students' learning experience in online learning during the pandemic. *Al-Ishlah: Jurnal Pendidikan*, 13(2), 979-987.

Taherdoost, H. (2016). Sampling Methods in Research Methodology; How to Choose a Sampling Technique for Research. *International Journal of Advance Research in Management*. 5(2), 18-27.

Talukder, M. (2014). *Managing Innovation Adoption: From Innovation to Implementation*, Taylor & Francis.

Teoh, K. B., Gan, K. H., Rishimelan, S., Kavithanji, M., Yong, H. Y., Lee, J. M., & Lim, Y. Y. (2022). A Study on Customer Satisfaction of Telekom Malaysia Broadband. *Asia Pacific Journal of Management and Education (APJME)*, 5(1), 79-93.

Van Wart, M., Ni, A. Y., Ready, D., Shayo, C., & Court, J. (2020). Factors Leading to Online Learner Satisfaction. *Business Education Innovation Journal*, 12(1), 14–24.

Venkatesh, V. Morris, M.G., Davis, G.B., & Davis, F.D. (2003). User acceptance of information technology : toward a unified view. *MIS Quarterly*, 27 (3) (2003), pp. 425-478.

Wang, M. & Wegerif, R. (2019). From active-in-behavior to active-in-thinking in learning with technology, *British Journal of Educational Technology*. 50(5), 2178–2180.

Wang, Q., Khan, M. S., & Khan, M. K. (2021). Predicting user-perceived satisfaction and reuse intentions toward massive open online courses (MOOCs) in the Covid-19 pandemic: An application of the UTAUT model and quality factors. *International Journal of Research in Business and Social Science (2147-4478)*, 10(2), 1-11.

Wart, M. V., Ni, A. Y., Ready, D., Shayo, C. & Court, J. (2020). Factors leading to online learner satisfaction. *Business Education Innovation Journal*, 12(1), 14-24.

Watts, J. (2019). Assessing an online student orientation: Impacts on retention, satisfaction, and student learning. *Technical Communication Quarterly*.
<https://www.tandfonline.com/doi/abs/10.1080/10572252.2019.1607905>

Weil, J. (2017). *Research design in aging and social gerontology: Quantitative, qualitative, and mixed methods*. Taylor and Francis.

Wengrowicz, N., Swart, W., Paul, R., Macleod, K., Dori, D., & Dori, Y. J. (2018). Students' collaborative learning attitudes and their satisfaction with online collaborative case-based courses. *American Journal of Distance Education*, 32(4), 283–300.

Wilcox, B. & Vignant, N. (2020). Recommendations for emergency remote teaching based on the student experience. *The Physics Teacher*, 58, 374-375
<https://aapt.scitation.org/doi/10.1119/10.0001828>

Zikmund, W.G., Babin, B.J., Carr, J.C. & Griffin, M. (2013). *Business Research Methods*. 8th ed. Ohio: South-Western.

Zimmerman, J. (2020). Coronavirus and the Great Online-Learning Experiment. *Chronicle of Higher Education*

[http://www.cetla.howard.edu/workshops/docs/The%20Difference%20Between%20Emergency%20Remote%20Teaching%20and%20Online%20Learning%20_%20EDUCAUSE%20\(2\).pdf](http://www.cetla.howard.edu/workshops/docs/The%20Difference%20Between%20Emergency%20Remote%20Teaching%20and%20Online%20Learning%20_%20EDUCAUSE%20(2).pdf)

Zuo, M., Ma, Y., Hu, Y., & Luo, H. (2021). K-12 students' online learning experiences during COVID-19: Lessons from China. *Frontiers of Education in China*, 16(1), 1-30.

THE EFFECTS OF COGNITIVE RESTRUCTURING AND STUDY SKILLS TRAINING ON TEST ANXIETY AND ACADEMIC ACHIEVEMENT AMONG UNIVERSITY STUDENTS

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ABSTRACT

The study investigates the effectiveness of cognitive restructuring (CR) and study-skill training (SST) on test anxiety and academic achievement among university students. The study design was an experimental design using randomized pre, post, and follow-up tests with the control group. A total of 94 participants participated in this study. They were selected randomly and assessed quantitatively three times by State-Trait Anxiety Inventory (STAI) and one time by cumulative grade point average (CGPA). The ANOVA repeated measures analysis revealed significant differences between SST and CR's effects on anxiety and academic achievement. The results indicated that students who received the-SST intervention treatment showed a substantial decrease in state and trait anxiety in the post-test and consequently improved their academic achievements. While the CR intervention treatment group significantly reduced trait anxiety in post-test and follow-up, there was no effect on state anxiety and academic achievements compared to the control group. This study underlines our contention that CR and SST psycho-educational intervention significantly affects students' test anxiety and academic achievement. Additionally, the findings suggest that SST influenced students' state and trait anxiety levels while CR just influenced students' trait anxiety. Although this study does not include qualitative research to provide a deeper understanding, the findings provide a valuable framework for psychologists, counselors, and lecturers to successfully implement psycho-educational interventions in higher education to enhance students' academic achievement and decrease anxiety levels.

Keywords: Cognitive Restructuring, Test Anxiety, Academic Achievement, Study Skills Training, Under Graduate Students

Introduction

Anxiety is a familiar emotion to all people caused by perceived danger, harm, loss, or threat (Hockenbury & Hockenbury, 2010; Arroll & Kendrick, 2018). The word anxiety comes from 'to vex or trouble'. Then anxiety means in the absence or presence of psychological stress, and anxiety can cause feelings of fear, concern, and horror (Bouras, 2007). In recent definition, anxiety refers to a physiological state that consists of emotional, somatic, cognitive, and behavioral components (Seligman et al., 2010; Kapur et al., 2019). Similarly, anxiety is assumed to be a natural and ordinary response to a stressful agent, assisting one in handling a cumbersome condition by encouraging the individual to be adapted to the problem. Severity and reason determine the normality or abnormality of anxiety (Barker, 2009; Stein & Nesse, 2015; Shin et al., 2020). In addition, anxiety is considered part of personal life in all communities as an appropriate and consistent response. Lack of anxiety or extreme anxiety can cause problems that may lead to substantial risks. On the other hand, moderate anxiety can motivate people to manage their concerns to be successful in their life (Reeve, 2014). Therefore, it is a need for students who suffer from high levels of anxiety to be taught and experience how to control it.

On the other hand, academic achievement involves how students deal with their studies in educational settings and how they handle different kinds of tasks given to them by their educators. Therefore, academic achievement is essential for students to learn written and spoken (Seif, 2013). The academic achievement evaluation measures learners' academic progress. It compares performance results with predetermined educational goals to determine whether the educators' training activities and learning efforts are achieved to a certain degree (Seif, 2013). Consequently, when the students' academic achievements are evaluated based on different examinations, it will be a tool to investigate the influential factors on their academic achievement. The evaluations include a lack of study habits and test-taking skills, cognitive distortions, and test anxiety.

Test anxiety is an educational problem that all students experience. Practically, students will experience some anxiety when taking a test, but for some students, the level of anxiety increases and ultimately affects their performance (Reiss et al., 2017; Safeer & Shah, 2019; Kumari, 2019; Ghorbani et al., 2020). Trait anxiety is also a common and valuable phenomenon in education, which involves the combination of physiological over-arousal, worry, and dread about test performance; and frequently disturbs everyday learning and decreases test performance (Miller et al., 2006; Reiss et al., 2017). Based on the DSM-5 (2013) diagnostic criteria, severe test anxiety symptoms are considered a symptom of a social anxiety disorder (American Psychiatric Association, 2013). The other evidence indicated that test anxiety is a notable phenomenon in the educational system which has a close relationship with students' performance and academic progress (Fayegh et al., 2010; Motevalli et al., 2021; Motevalli et al., 2013a,b; Abdollahi, & Abu Talib, 2015). Generally, numerous studies have shown a significant negative relationship between test anxiety and

academic achievement among anxious students (von der Embse et al., 2018; Gunderson et al., 2018; Pascoe et al., 2020).

Test anxiety is associated with severe fear, worry, high heartbeat, butterfly in the chest, and other physiological symptoms (Abdollahi & Abu Talib, 2015). Numerous studies suggest that there are at least two components of test anxiety: worry and emotionality (Putwain, 2007; Putwain & Daly, 2014; Putwain et al., 2021; ur Rehman et al., 2021). The worry component is related to the cognitive anxiety and pessimism about the student's competence and performance, but the emotionality component refers to the physiological arousal during the exams (Putwain, 2007). Anxious students interpret the exam as a threatening situation or stimulus, so in such cases, they behave as though they were in danger and threatened. The findings on test anxiety revealed that students who suffer from test anxiety had demonstrated poor academic performance (Mazzone et al., 2007; Ingul & Nordahl, 2013). Likewise, research indicated that a high-stress level could decrease the quality of students' memory, and so do their reasoning and concentration (Aronen, 2004; Dowker & Sheridan, 2022). Test anxiety suggests growing concern about situations in which there is a formal performance evaluation, specifically in the academic areas.

In test anxiety, the worry component denotes cognitive uneasy feeling about the probability of occurrence of disappointment, embarrassment, or failure. It may also involve mental disorders such as memory problems, oversensitivity, and concentration difficulty (Rothman, 2004; Wang et al., 2021). Moreover, McDonald states that the worry component refers to uncontrollable, unwanted, repelling cognitive activity linked to negative thoughts and emotional uneasiness (McDonald, 2001). The studies conducted by Lowe suggested that social humiliation and derogation are associated with fear or worry that will cause lower quality of one's performance on tests (Lowe et al., 2008).

In educational psychology, there are a considerable number of interventions to reduce anxiety levels among students and, at the same time, increase their academic achievement. One of these interventions is cognitive restructuring (CR) (Motevalli et al., 2020), which is a learning process to disprove cognitive distortions or the fundamentals of 'faulty thinking' to replace one's irrational, counter-factual beliefs with more accurate and profitable ones (Motevalli et al., 2020; Motevalli et al., 2021). However, it is remarkable to consider that CR does not entirely mention the reorganization of irrational thoughts in the brain. The ongoing restructuring of thoughts is directly related to some terms such as adaptation, accommodation, and structure of knowledge and rational thoughts. Cognitive restructuring is a psycho-therapeutic and systematic learning strategy that helps clients identify and dispute cognitive distortions. These distortions, called maladaptive thoughts, automatic negative thoughts, irrational beliefs, and emotional reasoning, are linked to various psychological disorders (Cormier, & Cormier, 1991; Gladding & Batra, 2007; Martin & Dahlen, 2005). Cognitive restructuring utilizes different kinds of strategies, such as thought recording, Socratic questioning, and guided imagery, and is applied regularly in Rational Emotive Behaviour Therapy (REBT) and Cognitive Behavioural Therapy (CBT) (Gladding, & Batra, 2007; Martin, & Dahlen, 2005).

Similarly, cognitive restructuring means different things to different people; indeed, it is a therapeutic technique that disproves irrational ideas and substitutes them with rational ones (Ogugua, 2010). There are two widely held cognitive therapeutic methods in test anxiety intervention (1) rational emotive behavior therapy (Ellis, 1962, 1977) and (2) systematic, rational restructuring (Goldfried et al., 1974). The premise is that anxiety or emotional disturbance results from illogical thoughts or beliefs. However, rational emotive behavior therapy provides the rationale for cognitive restructuring, and systematic, rational restructuring classifies this rationale into a series of more systematic steps and procedures (Zeidner, 1998; Motevalli et al., 2020).

Another therapy based on the skill-deficit model is study-skills training (SST). Some studies argue that poor study habits and test-taking abilities may cause some students to experience higher test anxiety (Gharamaleki, 2006; Spielberger & Vagg, 1995a; Motevalli et al., 2013b; Yusefzadeh et al., 2019). In addition, there are several advantages of study skills interventions to students, such as recovering and increasing the study and test-taking habits and skills to improve students' cognitive processes. These study skills affect the organization, processing, and information retrieval (Spielberger & Vagg, 1995b; Zeidner, 1998; Hailikari et al., 2018). Study skills and test-taking skills training are two related treatment components of the SST program. SST teaches students how to study and prepare for tests. This method attempts to teach students how to use study planning and time management techniques, reading and summarizing skills, monitoring study behaviors, acquiring techniques in studying for the exam and using response management techniques (Sapp, 1999; Hailikari et al., 2018). Some psychologists believe that test-taking training classifies ways that serve anxious students to comprehend exam questions better and follow the test instructions due to the appropriate information that can be retrieved, organized, and communicated (Spielberger & Vagg, 1995a). Consequently, several studies have shown that poor study skills can predict lower academic achievement (Ayesha & Khurshid, 2013; Numan & Hasan, 2017; Ogunsanya & Olayinka, 2020). It also significantly affects students' test anxiety and their academic achievement (Numan & Hasan, 2017).

Previous investigations revealed no noticeable evidence to apply a test anxiety intervention in Iran that considers SST (study habits and test-taking skills) and CR therapy (rational emotive therapy and systematic, rational restructuring). These were done through the experimental study with pre, post, and follow-up tests and comparing the effects of interventions among university students. Besides, previous studies considered only one program based on cognitive or behavioral therapy to cope with test anxiety. In addition, previous studies based on cognitive and behavioral therapy use advice for academic achievement.

Thus, the current study aims to investigate (a) confirming the importance of CR therapy and SST interventions among Iranian university students with test anxiety and (b) examining the effects of CR and SST on Iranian students' test anxiety (state anxiety and trait anxiety), (c)

testing the assumption that applying CR therapy and SST on test anxiety could be effective ways to increase the academic achievement among Iranian university students.

Methods

Ethical Approval and Informed Consent

The research team obtained the approval for the present study from the Faculty of Educational Studies at the Universiti Putra Malaysia and the Iran Ministry of Higher Education. Qazvin Islamic Azad University Research Management Center gave the researchers written informed consent and participants' informed writing permission. The researchers conducted the study in compliance with the American Psychological Association's (2010) ethical research principles with human participants.

Study Design

Based on the objectives of this study, an actual experimental design and pre and post-test with a control group were applied. The method in this category is natural experiments because subjects are randomly selected, and it strongly recommends designing educational experiments concerning the control they provide (Ary et al., 2018). Thus, this study collected data using an experimental research design with randomized subjects, pre-test, post-test, and follow-up within the control group. The researchers conducted a post-test-only control group design to study academic achievement in time after interventions that were presumed to have caused the change.

Population and Sampling

Ninety-four students -as the population sample- from Qazvin University's province were randomly selected and participated in this study. According to permission from the Iran ministry of higher education, the population of this study comes from undergraduate students of Qazvin university. Islamic Azad University and Buin-Zahra, were considered a sample among five high-ranked universities for the pilot study to calibrate the instrument and interventions. The researchers use Qazvin Islamic Azad University (QIAU) as a sample in the actual experiment data collection. Ecological validity (when the situational characteristics of the study are not representative of the population) could threaten external validity.

Table1: Threats to external validity and methods of control

	Threats	How to control
1	Selection-treatment interaction (non-representativeness)	Random assignment, administrating pre-tests for experimental and control groups, and making participation in the experiment as convenient as possible for all individuals in a population.
2	Setting-treatment interaction (artificiality)	Same treatment, treatment setting is a clinical setting. Thus, it is not a threat in this study.
3	Pretest-treatment interaction	Control group
4	Subject effects	Considering time intervals and generally acting to the participants, keeping students unaware of their location in the group.

5	Experimenter effects	Standardize all procedures in the treatment and refrain from communicating with the participants.
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Since external validity involves determining whether the results of the experiment can be generalized to an entire population from which the samples were drawn in the study. The methods of subject selection and control procedures and type of design strengthen inferences that the findings are representative, but the induction remains inconclusive. To summarize, Table 1 explains the process of controlling the threats to external validity (e.g., selection-treatment interaction, setting-treatment interaction (artificiality), pre-test treatment interaction, and subject effects).

The power of analysis using G*Power 3.1.9.2 indicated that for ANOVA Repeated measures within-between interaction analysis, a sample size of 54 for each group would give 70% power. Therefore, 18 participants are in each group. The study suggests a total required sample size of 54 undergraduate university students. To avoid mortality, ninety-four participants were randomly selected to attend three groups (CR, SST, and CG). Using a Table of Random Numbers, the researcher randomly assigns each person in the population a number. Then the first number was assigned to the group with CR intervention, the second number to the group with SST intervention, and the third number to the CG. The researchers continued the process until this study's last number of needs was assigned to the CG. Through this process, samples were assigned randomly to three groups (two experimental and one control group).

Inclusion and Exclusion Criteria

There were some inclusion criteria for attending this study, such as (1) registered as full-time students at the undergraduate level, (2) currently reporting some irritating symptoms of anxiety to the university counseling office, and (3) being diagnosed with at least mild symptoms of a generalized anxiety disorder (because test anxiety can be identified as one kind of generalized anxiety disorder) by the university counselor. Moreover, there were some exclusion criteria for participating in this study, such as inability or unwillingness to attend the evaluation in post-test and follow-up and failure to follow the psycho-educational sessions for more than three sessions. Their disturbance is attributable to the physiological effects of a substance (e.g., a drug of abuse, a medication) or another medical condition (e.g., hyperthyroidism). Another mental disorder better explains their disturbance (e.g., panic disorder, social phobia, obsessive-compulsive disorder, separation anxiety disorder, posttraumatic stress disorder, or mood disorders).

Measures

State-Trait Anxiety Inventory (STAI)

The main instrument used for assessment in this study was State-Trait Anxiety Inventory (STAI), developed by Spielberger in 1970 and revised in 1980. This revised instrument of anxiety inventory is known as a self-reported measure, in two different sections and 20 items for each—the first section standards “state anxiety” in terms of the emotional component of anxiety. Similarly, the second section measures “trait anxiety” as a worry

component of test anxiety. Meanwhile, each question is scored separately 1 to 4-point Likert scale (1: almost never, 2: sometimes, 3: always, and 4: almost always). All participants attempted the validated Farsi version of the STAI (Abduli, 2005) questionnaire (Bilingual; English-Farsi). The validity coefficient of state anxiety was 0.88, and for the trait anxiety was 0.86 also.

Academic Achievement

The researchers collected the Academic Achievement or Cumulative Grade Point Average data at the end of the second semester via grading the students' average marks. The collected data was in line with the Iranian educational system of CGPA, graded from 0.00 to 20.00 scale with 10.00 as the lowest passing grade. Table 2. shows the equality of the Iranian Grading Scale with the European and US grading system.

Table 2: Grading Scale in Iranian Higher Education

Iranian Scale	18.00-20.00	16.00-17.99	14.00-15.99	12.00-13.99	10.00-11.99	0.00-9.99
European & US Scale	A+	A	B	C	D	F

Interventions Treatments

Two intervention treatments (CR and SST) based on the cognitive approach and deficit skills theory apply to this study's CR and SST groups. The first experimental group was given eight sessions of the CR intervention treatment within 90 minutes for every session. Experimental group 2 also was assigned an SST treatment program with parallel sessions and duration. All of the participants undertook the treatment session consecutively once a week.

Cognitive Restructuring (CR)

Cognitive restructuring consists of eight critical activities to assist anxious students in understanding cognitive restructuring (CR). It describes how it can help them cope with irrational beliefs and ways to replace them with rational ones based on the CR Module developed by the researchers (Motevalli et al., 2020). Likewise, this intervention includes some strategies on cognitive restructuring that were helpful even if students do not suffer from high test anxiety. By completing cognitive restructuring module, anxious students are expected to: W1- understand the concept of anxiety and test anxiety, and its effects on the academic achievement (on the basis of test anxiety); W2- identify and explain two components of test anxiety (state and trait anxiety's symptoms, causes and effects); W3- determine the extreme irrational core beliefs about taking tests and study habits and identify the ABCDE model in test anxiety (on the basis of REBT model); W4- Introduce and practice four dialectic techniques to understand the rational thoughts such as recognizing, challenging, questioning, and disputing the irrational thoughts (on the basis of REBT model); W5- identify the adverse effects of perfectionism on test anxiety and academic achievement (on the basis of REBT model); W6- describe the worrisome task-irrelevant and task-relevant thoughts (on the basis of SRR model); W7- identify how to control their anxiety by

controlling task-irrelevant thoughts (on the basis of SRR), and W8- describe some different kinds of cognitive restructuring methods to cope with test anxiety and conclusion about all sessions.

Study Skills Training (SST)

SST is an intervention treatment based on the cognitive deficit approach also. Current thinking and researchers suggested that high test anxious students with poor study and test-taking skills would benefit more from SST with the interventions to improve their study habits and test-taking skills. SST improves various cognitive activities that affect the organization, processing, and retrieval of information (e.g., study habits and test-taking skills). Training in study skills does not directly address the specific cognitive components of test anxiety (Spielberger & Vagg, 1995b). Instead, it augments other cognitive interventions. By completing Study Skills Training module which was developed by the researchers (Motevalli et al., 2013) anxious students are expected to: W1- understand the concept of anxiety and test anxiety, its effects on the academic achievement, identify two components of test anxiety (state and trait anxiety); W2- determine and explain two techniques of study skills training (Study Habits and Test-Taking Skills); W3- list and explain some techniques of study skills to improve academic achievement such as motivation (essential components of motivation such as activation, persistence, and intensity, intrinsic and extrinsic motivation, learned helplessness), and goal setting (small, milestones, and big goals, SMART goals, self-performance management system); and W4- list and teach some methods of test-taking skills to improve academic achievements such as time management (activities such as time wasters self-assessment, time usage self-assessment, time-management strategies, my semester calendar, my weekly priority tasks list, and my weekly schedule) and memory [tips for sensory memory (filtering, attention, recognition, and perception), tips for short-term/working memory (highlight different approaches on short-term (Atkinson & Shiffrin, 1968) and working memory (Baddeley & Hitch, 1974), rehearsal training, duration and capacity), and tips for long-term memory such as explicit/declarative memory (conscious such as episodic and semantic) and implicit/non-declarative memory (not conscious such as procedural memory, priming, and conditioning)]; W5- defining study styles (visual, auditory, and kinaesthetic), reading efficiency (active vs. passive reader), muscle reading, MURDER (Mood, Understand, Recall, Detect, Elaborate, and Review), PQRST (Preview, Question, Read, Summarize, and Test), and PQ4R (Preview, Question, Read, Reflect, Recite, Review); W6- definition of test-taking skills, advantages and identify the tests' structure (tips for oral and written exam such as multiple choice question, fill in the blanks, matching, true/false, short essay, essay, and open book exam); W7- Some activities during the exam in order to deal effectively with oral exam (e.g. metacognitive strategies) and written exams (e.g. retrieval cues for multiple choice exams) ; W8- Conclusion of the previous sessions and question and answer about all sessions.

Measurement Procedure

The data was collected using an experimental research design with randomized subjects, pre-test, post-test, and follow-up test of the anxiety among all the groups; CR, SST, and CG. The pre-tests (STAI) were conducted before the interventions, and then the post-tests were carried out two weeks after the end of eight sessions of the intervention treatments. Finally,

the follow-up tests were conducted after six weeks of the interventions (4 weeks after post-test) to examine the effects of applied interventions after a certain period. In addition, the CG introduces all conditions and evaluations of the experiment except the experimental interventions.

Pilot Study

The pilot study has two parts: one to test the questionnaire used for the anxiety (STAI), and the other as a trial run for the participating students and senior university counselors to get acquainted with the instruction guide of interventions. Approximately 100 undergraduate students took part in the pilot study to validate the instrument used and check for the reliability of the State-Trait Anxiety Inventory (STAI). The Cronbach's alpha for the 40 items of STAI was .93, indicating that the items from a scale have good internal consistency reliability. A Pearson's correlation was computed to assess the test-retest reliability of the state anxiety scores, $r(100) = .93$, and trait anxiety scores, $r(100) = .89$. This indicates that there is also good test-retest reliability for state and trait anxiety questionnaires.

Data Analysis

The inferential data analysis was conducted using two-way repeated-measure ANOVA to identify the effects of the two treatment methods, CR and SST, on participants' anxiety (state and trait anxiety). The partial eta square (η^2) also reports the effect size of CR and SST. Bonferroni Post Hoc multiple comparisons test determines whether pre-test, post-test, and follow-up evaluation scores differed between participants in the study groups. One-way ANOVA was used to assess students' cumulative grade point average at the end of the semester. Before analysis, screening for missing values and violation of assumptions was carried out with SPSS 24.

Results

State and Trait Anxiety Pre-test Results

Pre-tests (state and trait anxiety) were conducted on all groups of students (two experimental groups and one control group). The aims of the pre-tests in this design were to assess students' state and trait anxiety for practicing students of cognitive restructuring therapy and study skills training before the treatment. One-way between-groups analysis of variance was performed to investigate state and trait anxiety differences in mean scores obtained by students taking the pre-test before the treatment. Preliminary assumption testing was conducted to check for normality and homogeneity of variance, with no serious violations noted. Table 3 and Figure 1 depict three study groups' mean scores and standard deviation in state anxiety. The one-way ANOVA test for state anxiety revealed that there was not a statistically significantly different in the mean state anxiety score among the three study groups, $F(2, 91) = .15, p = .85$ (Table4). Moreover, the one-way ANOVA test for trait anxiety revealed no statistically significant difference in the mean trait anxiety score among the three study groups, $F(2, 91) = .037, p = .96$ (Table4). Table 3 and Figure 2 depict the mean scores and standard deviation of three study groups in trait anxiety.

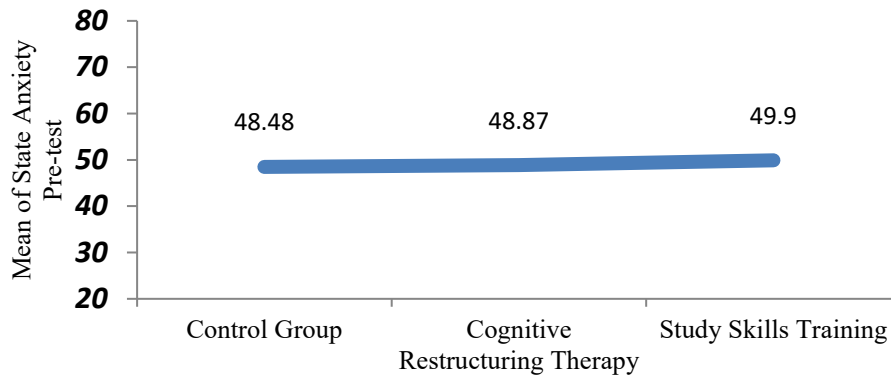


Figure1: Comparing of State Anxiety among SST, CRT, and Control Groups in a pre-test

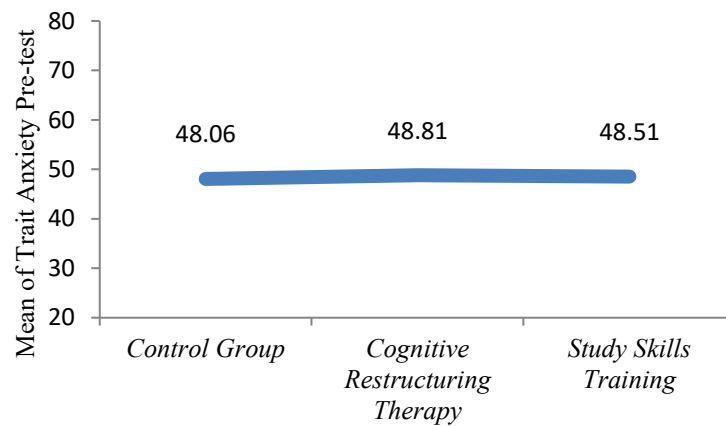


Figure2: Comparing Trait Anxiety among SST, CRT, and Control Groups in a pre-test

Table 3: Means and Standard Deviations of Study Groups on Pre-test of State and Trait Anxiety

Groups	State Anxiety		Trait Anxiety	
	M	SD	M	SD
CRT	48.88	10.04	48.81	10.93
SST	49.90	10.21	48.52	10.29
Control	48.48	10.88	48.06	11.61

Table4: One-Way ANOVA for State and Trait Anxiety pre-test

		Sum of Squares	df	Mean Square	F	p
State Anxiety	Between Groups	33.36	2	16.68	.15	.85
	Within Groups	9815.95	91	107.86		
	Total	9849.31	93			
Trait Anxiety	Between Groups	8.91	2	4.45	.03	.96
	Within Groups	10924.48	91	120.04		
	Total	10933.40	93			

Effects of CR and SST on State Anxiety

With regards to means, scores and standard deviation of students’ state anxiety in pre-test are (M = 48.48, SD = 10.9) for the CG, (M = 48.88, SD = 10.05) for the CR group, and (M = 49.90, SD = 10.22) for SST group suggest that students’ state anxiety among study groups is homogeneous. Similarly, with regards to means scores and standard deviation of students’ state anxiety in post-test are (M = 47.84, SD = 10.62) for the CG, (M = 47.25, SD = 10.15) for CR group, and (M = 39.03, SD = 7.9) for SST group suggest that students’ state anxiety on SST group is different from CR and CG. Finally, with regards to means scores and standard deviation of students’ state anxiety in follow-up are (M = 48.06, SD = 10.71) for the CG, (M = 47.22, SD = 10.04) for CR group, and (M = 40.71, SD = 8.32) for SST group suggest that students’ state anxiety on SST group is different from CG and CR groups (Table 5).

Table 5: State and trait anxiety of the participants based on the groups
(Mean ± SD)

Times	Groups	State Anxiety	Trait Anxiety
Pre-test	Control (n=31)	48.48± 10.88	48.06±11.61
	CR (n=32)	48.88±10.05	48.81±10.93
	SST (n=31)	49.90±10.22	48.52±10.29
Post-test	Control	47.84±10.62	47.90±11.30
	CR	47.25±10.15	39.25±9.75
	SST	39.03±7.89	41.39±7.72
Follow-up	Control	48.06±10.71	48.10±11.62
	CR	47.22±10.04	40.59±9.63
	SST	40.71±8.32	42.00±7.62

Two-way Repeated-Measures ANOVA, with Greenhouse-Geisser correction, was conducted to assess the main intervention effect, time main effect, and interaction between interventions and time. The following assumptions test, (a) independence of observations, (b) normality, and (c) sphericity. It meets the independence of observations and normality with the assumption of sphericity violated. As such, the researchers use Greenhouse-Geisser correction. Two-way Repeated Measure ANOVA is conducted to study the effect of groups across the test. Mauchly’s test assumption of sphericity was not violated for state anxiety ($\chi^2(2, .05) = 40.88, p < .01$). So, the degree of freedom had to be adjusted using Greenhouse-Geisser correction ($\epsilon = .73$). The findings for within-subjects effects of repeated measure of time were ($F(2.93, 133.33) = 56.77, p < 0.001, \eta^2 = 0.55, f = 1.1$). The p-value is reported as .001, which means less than .05. The average mean score for state anxiety across time (test) was significantly different among the three groups. Thus, the null hypothesis of the time effect is rejected (Table 6).

Table 6: Two-way repeated measure ANOVA analysis between time and study groups for state and trait anxiety

Source	Sum of Squares		Df		Mean		F		p	
	state anxiety y	trait anxiety y	state anxiety y	trait anxiety y	state anxiety y	trait anxiety y	state anxiety y	trait anxiety y	state anxiety y	trait anxiety y
test	1055.3	1757.08	1.46	1.31	720.28	1343.67	104.58	164.21	.001	.001
test * Group	1145.7	900.13	2.93	2.61	390.99	344.17	56.77	42.06	.001	.001
Error	918.28	973.71	133.32	118.99	6.88	8.18				

According to Figure 3, the experimental group's mean scores in state anxiety (SST) faced a marked drop between pre-test and post-test. It showed that the intervention was influential in the SST group. The SST group experienced a rapid decline of mean scores in state anxiety from pre-test to post-test and a steady increase from post-test to follow-up. Regarding this figure, the CG and CR did not show any significant changes in mean scores in state anxiety across pre, post, and follow-up tests. Post-hoc pairwise comparison was conducted to determine the significant difference between the groups based on the two interventions (CR and SST) in pairs in state anxiety (Table 7).

According to Table 7, the difference in mean scores of state anxiety post-test between group 1 and group 2 (CG and CR) with a p-value reported at 1.00, there is no significant difference. Besides, the results showed the mean difference of state anxiety between group 1 and group 3 (CG and SST) in post-test with a p-value reported at the .002 and between group 2 and group 3 (CR and SST) with a p-value reported at the .003, is significant because of the p-value is smaller than .05. With regards to Table 7, the difference in mean scores of state anxiety post-test between group 1 and group 2 (CG and CR) with a p-value reported at 1.00, there is no significant difference. Besides, the results showed the mean difference of state anxiety between group 1 and group 3 (CG and SST) in post-test, with p-value reported at the .011, and also between group 2 and group 3 (CR and SST) with a p-value reported at the .029, is significant because of the p-value is smaller than .05.

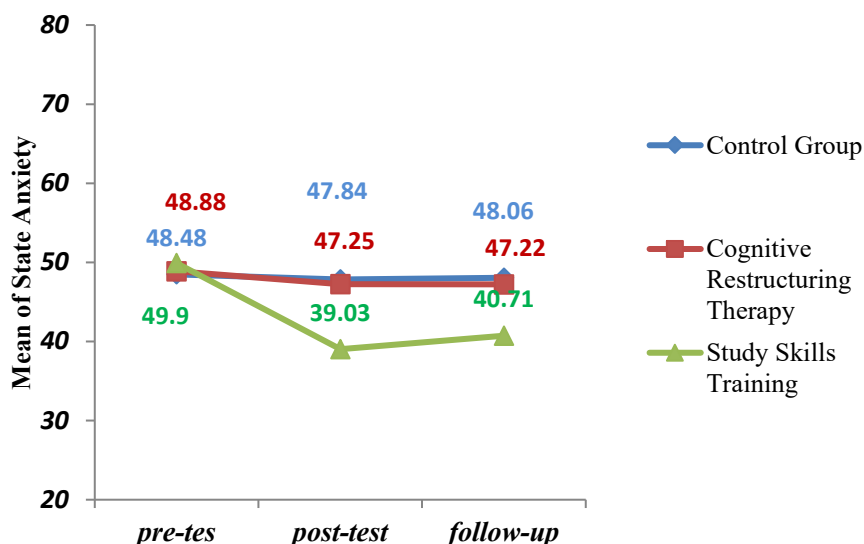


Figure 3: Mean of state anxiety obtained by study groups across pre, post, and follow-up tests

Table 7: Mean comparisons between pre, post, and follow-up tests in study groups for state and trait anxiety

Study Groups	(I) Test	(J) Test	Mean Difference (I-J)		Std. Error		Sig	
			state anxiety	trait anxiety	state anxiety	trait anxiety	state anxiety	trait anxiety
CG	1	2	.645	.16	.63	.68	.93	1.00
	1	3	.42	-.03	.67	.69	1.00	1.00
	2	3	-.226	-.19	.36	.3	1.00	1.00
CR	1	2	1.62	9.56	.62	.67	.03	.001
	1	3	1.66	8.22	.66	.68	.04	.001
	2	3	.031	-1.34	.36	.3	1.00	.001
SST	1	2	10.87	7.13	.63	.68	.001	.001
	1	3	9.19	6.52	.67	.7	.001	.001
	2	3	-1.68	-.613	.36	.31	.001	.15

Table 7 presented the three different pairs for the difference between mean scores of state anxiety between pre-test and post-test, pre-test and follow-up, and post-test and follow-up for all study groups. Regarding the table, the difference is significant for the two pairs in the first experimental group that received CR intervention. It is because the mean state anxiety scores between pre-test and post-test with p-value= .03 are smaller than .05. Furthermore, the difference in mean state anxiety scores between pre-test and follow-up with p-value= .04 is smaller than .05. However, there is no significant difference between post-test and follow-up in state anxiety in the first experimental group, which received CR because the mean scores of state anxiety between post-test and follow-up with p-value= 1.00 are bigger than .05. Correspondingly, the difference between the pre-test and post-test, pre-test and follow-up, and post-test and follow-up in state anxiety is significant for the second experimental

group that received SST intervention. It is because of the significant level reported at 1.00, which means it is smaller than .05. As it mentioned earlier, Cohen (1988); (Cohen, 1992) reported criteria for η^2 as follows (.01 = small effect, .06 = moderate effect, and .14 = large effect). The effect size for the mean comparison of state anxiety among three groups in the pre-test was .003. However, it was .15 and .11 in post-test and follow-up, which showed a high level of differences among the three groups.

Effects of CR and SST on Trait Anxiety

With regards to means scores and standard deviation of students' trait anxiety in pre-test are (M = 48.06, SD= 11.61) for the CG, (M = 48.81, SD = 10.93) for the CR group, and (Mean = 48.52, SD = 10.29) for SST group suggest that students' trait anxiety among study groups is homogeneous. The means scores and standard deviation of students' trait anxiety in post-test are (M = 47.90, SD = 11.30) for the CG, (M = 39.25, SD = 9.75) for the CR group, and (M = 41.39, SD= 7.72) for SST group suggest that students' trait anxiety on SST and CR groups are different from the CG. The means scores and standard deviation of students' trait anxiety in follow-up are (M = 48.10, SD = 11.62) for the CG, (M = 40.59, SD = 9.63) for the CR group, and (M = 42.00, SD = 7.62) for SST group suggest that students' trait anxiety on SST and CR groups are different from the CG (Table 2).

Two-way Repeated-Measures ANOVA, with Greenhouse-Geisser correction, was conducted to assess whether there were differences between the mean of trait anxiety of pre-test, post-test, and follow-up among the students in CR, SST, and CG. The following assumptions test (a) independence of observations, (b) normality, and (c) sphericity, meeting the independence of observations and normality with the assumption of sphericity violated. Thus, the Greenhouse-Geisser correction was used. Mauchly's test assumption of sphericity was not violated for trait anxiety ($\chi^2 (2, .05) = 67.84, p < .01$). So, the degree of freedom had to be adjusted using Greenhouse-Geisser correction ($\epsilon = .65$). The findings for within-subjects effects of Repeated Measure of time were (F (2.62, 118.99) = 42.06, $p < 0.001, \eta^2 = 0.48, f = .96$). The p-value is reported as .001, which means less than .05. The average mean score for trait anxiety across time (test) was significantly different among the three groups. Thus, the null hypothesis is rejected (Table 7).

Figure 4 shows the means scores in trait anxiety of two experimental groups (CR and SST) facing a marked drop between pre-test and post-test. It showed that the treatments were effective in two experimental groups. Both experimental groups that received CR and SST experienced a rapid decline in mean scores in trait anxiety from pre-test to post-test and a steady decrease from post-test to follow-up. The mean scores of trait anxiety in these two groups were at the same level from post-test to follow-up and stood in the same situation. Regarding this figure, the CG did not show any significant changes in mean scores in trait anxiety across pre, post, and follow-up tests. Bonferroni Post-hoc pairwise comparison was conducted to determine the significant difference between the groups based on the two interventions (CR and SST) in pairs.

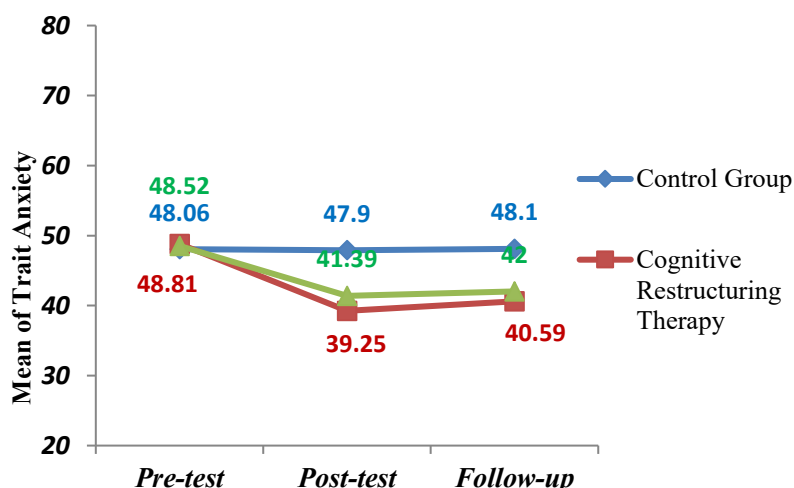


Figure 4: Mean of trait anxiety obtained by study groups across pre, post, and follow-up tests

Table 8 illustrates that the mean difference in trait anxiety between groups (CG, CR, and SST) in pairs was **insignificant** in the pre-test. For instance, the difference in means of trait anxiety between group 1 and group 2 (CG-CR) was not statistically significant. It is because the *p-value* reported at 1.00, which is bigger than .05. Furthermore, the table showed the mean difference between groups in post-test and follow-up is significant in pairs. According to Table 3, the difference in mean scores of trait anxiety post-test between group 1 and group 2 (CG and CR) with *p-value* reported at the.002, and also between group 1 and group 3 (CG and SST) with *p-value* reported at the .02, there are significant differences. The results showed that the mean difference in the mean of trait anxiety between group 2 and group 3 (CR and SST) in post-test is insignificant because of the *p-value* = 1.00. Based on the difference in the mean scores of trait anxiety follow-up between group 1 and group 2 (CG and CR) with a value reported at the.01, and between group 1 and group 3 (CG and SST) with a *p-value* reported at the .047, there are significant differences. The results also showed that the mean difference in trait anxiety between group 2 and group 3 (CR and SST) in follow-up is insignificant because of the *p-value* = 1.00. As it mentioned earlier, Cohen (1988); (Cohen, 1992) reported criteria for η^2 as follows (.01 = small effect, .06 = moderate effect, and .14 = large effect). The effect size for the mean comparison of trait anxiety among three groups in the pre-test was .001. However, it was .13 and .11 in post-test and follow-up, which showed a high level of differences among the three groups. Effects of CR and SST on Academic Achievement

Table 8: Mean comparison between study groups in pre, post, and follow-up tests for state and trait anxiety (Pairwise comparison)

STAI	(I) Study Groups	(J) Study Groups	Mean Difference (I-J)		Std. Error		Sig	
			state anxiety	trait anxiety	state anxiety	trait anxiety	state anxiety	trait anxiety
Pre-test	CG	CR	-.39	-.75	2.6	2.76	1.00	1.00
	CG	SST	-1.42	-.45	2.64	2.78	1.00	1.00
	CR	SST	-1.03	.29	2.62	2.76	1.00	1.00
Post-test	CG	CR	.59	8.65	2.43	2.44	1.00	.002
	CG	SST	8.8	6.51	2.45	2.46	.002	.03
	CR	SST	8.22	-2.14	2.43	2.45	.003	1.00
Follow-up	CG	CR	.85	7.5	2.46	2.46	1.00	.01
	CG	SST	7.35	6.1	2.48	2.48	.011	.047
	CR	SST	6.5	-1.4	2.46	2.46	.029	1.00

This study's third main null hypothesis refers to no significant difference in the mean of second-semester cumulative grade point average (CGPA) among the CR, SST, and CG students. One-way ANOVA assesses whether significant differences exist between the mean cumulative grade point average in students' second semester among the CR, SST, and CG (Figure 5). The ANOVA test revealed a statistically significant difference in the mean CGPA score among the three study groups with $F(2, 91) = 6.09, p = .003$. Based on Cohen's (1988) criteria for effect size “ η^2 ”, the eta-squared (η^2) obtained was 0.118, indicating that the mean difference among groups was large (Table 8). Bonferroni Post Hoc multiple comparisons test indicated that the SST group obtained a significantly higher mean CGPA score ($M = 17.20, SD = .89$) than the CG ($M = 16.56, SD = .76$). SST students' group also obtained a significantly higher mean of CGPA score ($M = 17.20, SD = .89$) than CR group ($M = 16.62, SD = .74$). On the other hand, there was no significant different mean score for the CG ($M = 16.56, SD = .76$) and CR group ($M = 16.62, SD = .74$) (Table 9).

Table 9: Results of analysis of variance between study groups on grade point average

Variable	N	M	SD	F	P	η^2
CR	32	16.62	.74	6.09	.003	.118
SST	31	17.20	.89			
CG	31	16.56	.76			

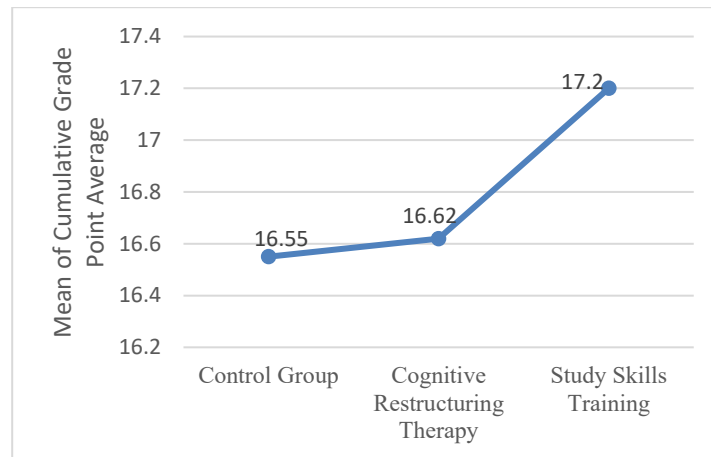


Figure 5: Comparing cumulative grade point average among study groups

Discussion

The study aimed to examine the effects of CR and SST intervention treatments on students' state, trait anxiety, and academic achievement. The findings revealed that SST could significantly reduce state and trait anxiety levels and academic achievement among university students, while CR only improved their trait anxiety level.

These findings also are in line with the results of previous research on the effects of study skills training on students' test anxiety (Gharamaleki, 2006; Sapp, 1999; Spielberger & Vagg, 1995a; Ayesha, & Khurshid, 2013; Numan, & Hasan, 2017; Ogunsanya, & Olayinka, 2020). One of the possible causes of the effectiveness of study skills training on students' state anxiety could be related to the students' coping skills. Coping skills refers to how a person attempts to change circumstances or interpretations of occasions to make them more favorable and less threatening (Folkman & Lazarus, 1991; Lazarus, 1999; Lazarus, 2000). Lazarus and Folkman (1984) classified two basic types of coping strategies: problem-focused and emotion-focused. Problem-focused coping aims to manage or change a threatening or harmful stressor by modifying the aspects of the situations that are changeable (Satterfield, 2008) or the cause of the problem (Adomako-Saahene, 2019). Problem-focused coping includes looking for more information concerning the situation, gaining new skills and strategies to manage it directly, or evaluating the negatives and positives of alternative solutions (Adomako-Saahene, 2019). Time management is one of the strategies in problem-focused coping for decreasing stress that can assist anxious people in appropriately managing stressful events. Studying skills training is highly focused on these skills as an essential skills for students. According to Robinson and Godbey (2005), time management can enhance productivity and, at the same time, reduce stress. Moreover, VanKim and Nelson (2013) found that students who met vigorous physical activity guidelines based on problem-focused coping strategies stated a lower level of perceived stress.

This coping strategy tends to be most effective when a person can exercise some control over the stressful condition or circumstances (Park et al., 2004). Emotion-focused coping strategies will be applied when a person thinks that nothing can be done to alter a situation

regarding the efforts toward relieving or regulating the emotional impact of the stressful situation. However, when coping is effective, people can adapt to the condition due to decrease stress and anxiety. According to some studies, people who applied effective coping strategies such as problem-focused and positive emotion-focused coping strategies experienced a low level of stress and anxiety exactly after the stressful event or even after a long time (Hanton et al., 2008; Szabo et al., 2016; Akhtar et al., 2019). In the current study, instead of directly decreasing the level of students' state anxiety, study skills training intervention attempts to cope with pressure based on problem-focused coping strategies by training students to improve their study habits and test-taking skills. Therefore, when anxious students improved their study and test-taking skills as a problem-focused approach, they could cope with state anxiety more than students who attended CR and CG.

The study's second objective was to determine the effects of CR and SST interventions on students' test anxiety (trait anxiety component). The finding related to this objective indicated that when students are involved in cognitive restructuring, their level of trait anxiety decreases significantly. Similarly, the results also proved that when students are engaged in SST intervention, their levels of trait anxiety decrease significantly among students. In addition, students' trait anxiety reduces significantly by conducting cognitive restructuring (the combination of Rational Emotive Behavior Therapy and Systematic Rational Restructuring) and SST (the combination of study habits and test-taking skills) interventions. Furthermore, the finding is consistent with the previous studies on the effects of cognitive therapy (Gharamaleki, 2006; Sansgiry et al., 2006; Sapp, 1999; Spielberger & Vagg, 1995b; Reiss et al., 2017; Podina et al., 2020) and study skills training (Gharamaleki, 2006; Sapp, 1999; Spielberger & Vagg, 1995a; Ayesha, & Khurshid, 2013; Numan, & Hasan, 2017; Ogunsanya, & Olayinka, 2020) on students' test anxiety.

Based on CR intervention, students are trained to challenge, recognize, and change irrational belief systems. This intervention applies rational emotive behavior therapy and then discovers the worrisome task-irrelevant thoughts and substitutes positive self-statement that redirects the attention to the task-relevant views using systematic, sound restructuring therapy. Anxious students could cope adequately with the trait anxiety component. However, SST intervention attempts to guide anxious students to adopt scientific study habits such as learning style, memory functions, time management, goal setting, motivation, reading, and summarizing skills instead of using the traditional study habit. Similarly, the current SST focuses on educating anxious students to apply some test-taking skills before, during, and after the exam to improve their academic achievement and challenge to decrease the level of students' trait anxiety. Based on the problem-focusing coping strategy, SST focus on managing or changing threatening or harmful stressors (e.g., Examination) by applying some activities to control the stressful condition or circumstances (Park et al., 2004; Robinson & Godbey, 2005; VanKim, & Nelson, 2013; Adomako-Saahene, 2019). In addition, this study proved the effectiveness of new cognitive restructuring and SST interventions due to reducing the level of students' trait anxiety.

The third objective of the study was to determine the effects of CR and SST interventions on students' academic achievement. The findings related to this objective indicated that when students are involved in SST, their levels of theoretical achievement increase significantly. As a result, the authors suggested that students' academic achievement in the SST group is different from CG and CR groups. Therefore, it concludes that SST significantly affects students' academic achievement. However, the finding further revealed that when students are involved in CR, their level of academic achievement does not increase substantially. Concerning this, students' academic achievement on CR and CG was not significantly different from each other. Thus, it also concludes that CR did not significantly affect students' academic achievement. These findings also are consistent with the results of previous studies, which show the effects of SST on students' academic achievement (Gharamaleki, 2006; Sapp, 1999; Spielberger & Vagg, 1995a, 1995b; Cottrell, 2019; Matcha et al., 2019; Shilling et al., 2020).

The stressful factors of an assessment situation are critical proximal parameters that evoke high levels of test anxiety. On the other hand, academic achievement is invariably affected by pressure when attention is diverted from task to self-belittling thoughts or negative self-statements. When the test interferes cognitively with recalling the previously learned material, the student's performance is affected, leading to aggravated physiological reactivity. Some studies indicated that students with high test anxiety are concerned and encounter more distractive cognitions under assessment conditions than other students, and anxious students also deteriorate their performance (Kurosawa, & Harackiewicz, 2006; Cochran, 2019). Thus, CR may assist anxious students in removing disruptive thoughts and help students with test anxiety better control their thoughts and concentrate on the task (Reiss et al., 2017; Zeidner, 1998). Although some researchers proved the effects of cognitive therapy on test anxiety and academic achievement (no citation) but based on this study, CR could not help anxious students to cope efficiently with test anxiety and improve their academic achievement.

On the other hand, based on the skills-deficit model, meta-cognitive awareness is a distinctive characteristic of the anxiety experience. It is the case where anxious people experience more anxiety because they have negative beliefs about emotional experiences and are not ready to confront a stressful event (Leahy et al., 2019). Therefore, they will experience more emotional disturbances such as anxiety and stress and also feelings of low academic ability. Etiologically, the deficit model says that fear and poor performance result from weak efficiency on the part of the student to study well and his lack of knowledge of test-taking skills. This model traces back to the insufficient attention given by parents and the university's improper teaching strategies and styles in this regard. Considering the proximal factors which bring about evaluative stress, the skills-deficit model emphasizes the impact of the importance of the study material. This model boasts the examinee's knowledge of insufficient material intake due to poor study skills. Test anxiety indicates that the students are not ready for the test. Hence, this model aims to provide study skill training and counseling to the students to prepare to deal with the test situation (Zeidner, 1998). Concerning the findings which show significant effects of SST psycho-educational

intervention, it could be concluded that SST could help anxious students to improve their poor study habits and test-taking skills. As a result, based on adequate SST (study habits and test-taking skills) intervention, anxious students could be able to combat test anxiety and improve their academic achievement.

Conclusion

The findings of this study revealed that SST intervention treatment has significant effects on decreasing state and trait anxiety, and it could improve students' academic achievement. Therefore, SST intervention could reduce anxiety components, states, and traits, which will enhance university students' academic achievement. Meanwhile, CR intervention treatment could only diminish the feature of anxiety, and there was no significant betterment in students' academic achievement and state anxiety. This study's findings recommended that SST intervention could be a reliable treatment to assist anxious students in correctly combating test anxiety. It seems that the educational system should consider the benefit of SST methods besides the other pedagogical approaches to improve academic achievements among the students.

The implication of the study

The current study's findings have some important practical implications for those who plan to cope with test anxiety among university students by using special programs such as SST and CR for this widespread educational problem. The first practical implication of the findings is to decrease the test anxiety level in a particular psycho-educational intervention program among anxious students. It is essential to provide successful experiences with SST techniques to provide successful activities to decrease the students' test anxiety and increase their academic achievement. There are some requirement criteria to be met. The first criterion for planning any psycho-educational intervention program on test anxiety is providing a set of tasks that attempt to train anxious students to improve their study and test-taking skills. It includes the evaluation of students' motivational level with regards to intrinsic and extrinsic motivation, tasks on goal setting, time management, memory (short-term sensory store, working memory, and long-term memory), learning styles, active reading versus passive reading, muscle reading, PQ4R, and different kinds of strategies for test-taking. It reveals that activities such as study habits found in some educational training centers for anxious students in Iran do not provide appropriate treatment for the worried students to cope with test anxiety and improve their academic achievement. Thus, it is essential to consider this vital criterion in planning any psycho-educational intervention program for anxious students to enhance their academic achievement and decrease their level of test anxiety. A suitable psycho-educational intervention regarding individual differences based on students' deficit skills could provide different activities for different students. Thus, to give a sufficient intervention for anxious students, it is essential to offer a flexible training skill intervention base on the skill level of each student during an individualized intervention program. Thus, to provide a sufficient intervention for anxious students, it is vital to offer an entire CR intervention with regards to different models and techniques on a cognitive

approach to help anxious students to combat sufficiently with this common educational problem.

Limitation of the Study

This study has some potential limitations. The first limitation was selecting the sample, which presents an actual example of Iranian university students from a vast population of Iranian university students. The second limitation was applying two methods of intervention (cognitive restructuring therapy and study skills training) in this study which needed to know about the contents of treatments and engage with some problems by different subjects in different groups. Therefore, the generalization of this study to other university students in other settings such as private and public universities or even other countries must be cautious. However, the findings might be helpful for universities that are similar to the one in this study.

Recommendations

However, since its implementation at the classroom level needs some specific skills from the educators and counselors, in-service be given to educators and counselors from time to time. It recommends the Ministry of Higher Education offer an in-service course to all the lecturers and university counselors to equip themselves with pedagogical skills, especially in teaching SST and CR. Counselors and lecturers should realize that teaching SST and CR are helpful methods to decrease test anxiety and increase academic achievement among students. Even though lecturers are exposed to several pedagogical approaches, a particular emphasis on the teaching methods and techniques of study skills and test-taking should be given since its effectiveness supersedes the traditional study habits and practices.

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Compliance with Ethical Standards

Conflict of interest The authors declare that there is no conflict of interest.

References

- Abduli, N. (2005). *Verify the feasibility and validity of and software inventory survey of high school students in the city of Kermanshah in character mode*. Master, Islamic Azad University, Central Tehran Branch, Iran.
- Abdollahi, A., & Abu Talib, M. (2015). Emotional intelligence moderates perfectionism and test anxiety among Iranian students. *School Psychology International*, 36(5), 498-512.
- Adomako-Saahene, N. (2019). Assessment of Perceived Levels of Stress and Coping Mechanisms Among University Students.
- Akhtar, M., Herwig, B. K., & Faize, F. A. (2019). Depression and Anxiety among International Medical Students in Germany: The Predictive Role of Coping Styles. *JPMA*, 69(230).
- American Psychological Association. (2010). *Ethical principles of psychologists and code of conduct*. Washington, DC: Author.
- American Psychiatric Association, 2013. *Diagnostic and statistical manual of mental disorders*, fifth. American Psychiatric Publishing, Arlington VA.
- Atkinson, R. C., & Shiffrin, R. M. (1968). Human memory: A proposed system and its control processes. *Psychology of learning and motivation*, 2(4), 89-195.
- Aronen, E. T., Vuontela, V., Steenari, M. R., Salmi, J., & Carlson, S. (2005). Working memory, psychiatric symptoms, and academic performance at school. *Neurobiology of learning and memory*, 83(1), 33-42.
- Arroll, B., & Kendrick, T. (2018). Definition of Anxiety. *Primary Care Mental Health*, 125.
- Ary, D., Jacobs, L. C., Irvine, C. K. S., & Walker, D. (2018). *Introduction to research in education*. Cengage Learning.
- Ayesha, B., & Khurshid, F. (2013). The relationship of multiple intelligence and effective study skills with academic achievement among university students. *Global Journal of Human-Social Science*, 13(1), 20-32.
- Baddeley, A. D., Hitch, G., & Bower, G. H. (1974). *The psychology of learning and motivation*.
Barker, P. (2009). *Psychiatric and Mental Health Nursing: The Craft of Caring*. USA: Oxford University Press.
- Bouras, N. a. H., G. (2007). *Psychiatric and Behavioural Disorders in Intellectual and Developmental Disabilities* (2nd ed.). UK: Cambridge University Press.
- Cochran, C. J. (2019). *Test anxiety and the attention training technique (ATT): a feasibility study* (Doctoral dissertation).

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2 ed.). New Jersey: Lawrence Erlbaum Association publisher.

Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112(1), 155.

Cooper, P. J., & Steere, J. (1995). A comparison of two psychological treatments for bulimia nervosa: Implications for models of maintenance. *Behavior research and therapy*, 33(8), 875-885.

Cormier, W. H., & Cormier, S. L. (1991). *Interviewing strategies for helpers: Fundamental skills and cognitive behavioral interventions* (3rd ed ed.): Pacific Grove, CA: Brooks/Cole.

Cottrell, S. (2019). *The study skills handbook*. Macmillan International Higher Education.

Dowker, A., & Sheridan, H. (2022). Relationships between mathematics performance and attitudes to mathematics: influence of gender, test anxiety, and working memory. *Frontiers in Psychology*, 13.

Ellis, A. (1962). *Reason and emotion in psychotherapy*. New York: Lyle Stuart.

Ellis, A. (1977). Rational-emotive therapy: Research data that support the clinical and personality hypotheses of RET and other modes of cognitive-behavior therapy. *Counseling Psychologist*, 7, 2-42.

Fayegh, Y., Rumaya, J., & Talib, M. A. (2010). The effects of family income on test anxiety and academic achievement among Iranian high school students. *Asian Social Science*, 6(6).

Folkman, S., & Lazarus, R. S. (1991). Coping and emotion. In *Alan Monat & Richard S Lazarus (Eds), stress and coping: An anthology* (3rd ed.). New York: Columbia University Press.

Gharamaleki, N. S. (2006). *Comparing the efficacy of cognitive therapy and study skills training in treating test anxiety and improving academic achievement regarding personality components*. PhD., Tarbiat Modares University.

Gladding, S. T., & Batra, P. (2007). *Counseling: A comprehensive profession*. Pearson Education India.

Goldfried, M. R., Decenteceo, E. T., & Weinberg, L. (1974). Systematic, rational restructuring as a self-control technique. *Behavior Therapy*, 5(2), 247-254.

Ghorbani, E., Zaharakar, K., & Mohsenzadeh, F. (2020). The effectiveness of rational emotive behavior therapy-based education in students' academic burnout and buoyancy. *PSYCHOLOGY AND EDUCATION*, 57(2), 95-100.

Gunderson, E. A., Park, D., Maloney, E. A., Beilock, S. L., & Levine, S. C. (2018). Reciprocal relations among motivational frameworks, math anxiety, and math achievement in early elementary school. *Journal of Cognition and Development*, 19(1), 21-46.

Hailikari, T., Tuononen, T., & Parpala, A. (2018). Students' experiences of the factors affecting their study progress: Differences in study profiles. *Journal of Further and Higher Education*, 42(1), 1-12.

- Hanton, S., Neil, R., Mellalieu, S. D., & Fletcher, D. (2008). Competitive experience and performance status: An investigation into multidimensional anxiety and coping. *European Journal of Sport Science*, 8(3), 143-152.
- Hockenbury, D. H., & Hockenbury, S. E. (2010). *Discovering Psychology*: WH Freeman & Company.
- Ingul, J. M., & Nordahl, H. M. (2013). Anxiety as a risk factor for school absenteeism: what differentiates anxious school attenders from non-attenders?. *Annals of general psychiatry*, 12(1), 1-9.
- Kapur, S., Debar, V., & Kaur, R. (2019). Lifestyle affects the pre-competitive state anxiety: Study on male and female basketball players.
- Kumari, A. (2019). Text Anxiety concerning Academic Achievement of Kasturiba Gandhi Balika Vidyalaya (KGBV) Students--A Study. *Shanlax International Journal of Education*, 7(4), 52-55.
- Kurosawa, K., & Harackiewicz, J. M. (2006). Test Anxiety, Self-Awareness, and Cognitive Interference: A Process Analysis. *Journal of Personality*, 63(4), 931-951.
- Lazarus, R. S. (1999). *Stress and Emotion: A new synthesis*. New York: Springer.
- Lazarus, R. S. (2000). Toward better research on stress and coping. *American Psychologist*, 55, 556-773.
- Leahy, R. L., Wupperman, P., Edwards, E., Shivaji, S., & Molina, N. (2019). Metacognition and emotional schemas: Effects on depression and anxiety. *International Journal of Cognitive Therapy*, 12(1), 25-37.
- Lowe, P. A., Lee, S. W., Witteborg, K. M., Prichard, K. W., Luhr, M. E., Cullinan, C. M., ... & Janik, M. (2008). The Test Anxiety Inventory for Children and Adolescents (TAICA) examination of the psychometric properties of a new multidimensional measure of test anxiety among elementary and secondary school students. *Journal of Psychoeducational Assessment*, 26(3), 215-230.
- Mazzone, L., Ducci, F., Scoto, M. C., Passaniti, E., D'Arrigo, V. G., & Vitiello, B. (2007). The role of anxiety symptoms in school performance in a community sample of children and adolescents. *BMC public health*, 7(1), 1-6.
- Martin, R. C., & Dahlen, E. R. (2005). Cognitive emotion regulation in the prediction of depression, anxiety, stress, and anger. *Personality and individual differences*, 39(7), 1249-1260.
- Matcha, W., Gašević, D., Uzir, N. A. A., Jovanović, J., & Pardo, A. (2019, March). Analytics of learning strategies: associations with academic performance and feedback. In *Proceedings of the 9th International Conference on Learning Analytics & Knowledge* (pp. 461-470).
- McDonald, A. S. (2001). The prevalence and effects of test anxiety in school children. *Educational psychology*, 21(1), 89-101.

- Miller, M., Morton, J., Driscoll, R., & Davis, K. A. (2006). Accelerated Desensitization with Adaptive Attitudes and Test Gains with 5th Graders. *Education Resources Information Center, 14*.
- Motevalli, S., Hamzah, M. S. G., Roslan, S., Hamzah, S. R. A., & Garmjani, M. G. (2021). The Effects of Study Skills Training on Qualitative Academic Achievement among Students. *Asian Journal of University Education, 17*(3), 130-141.
- Motevalli, S., Hamzah M. S. G., & Garmjani M. G. (2020). A New Cognitive Restructuring and Critical Thinking Intervention on Test Anxiety. *International Research Journal of Education and Sciences, 4*(1).
- Motevalli, S., Roslan, S. B., Sulaiman, T., Hamzah, S. G., Hassan, N. C., & Garmjani, M. G. (2013a). New study skills training intervention for students who suffer from test anxiety. *Asian Social Science, 9*(7), 85-96.
- Motevalli, S., Sulaiman, T., Hamzah, M. S. G., Garmjani, M. G., Kamaliyeh, N. G., & Roslan, S. (2013b). The effects of cognitive restructuring intervention on state and trait anxiety among Iranian high school students. *World Applied Sciences Journal, 26*(11), 1499-1504.
- Numan, A., & Hasan, S. S. (2017). Effect of Study Habits on Test Anxiety and Academic Achievement of Undergraduate Students. *Journal of Research & Reflections in Education (JRRE), 11*(1).
- Ogugua, G. U. (2010). Effects of Cognitive restructuring, on Mathematics achievement of secondary school adolescents. *Unpublished Master's thesis, Nnamdi Azikiwe University, Awka, Nigeria*.
- Ogunsanya, A. O., & Olayinka, B. (2020). Study Habit and Test Anxiety as Determinants of Secondary School Students Performance in Social Studies. *KIU Journal of Humanities, 5*(1), 269-277.
- Park, C., L., Armeli, S., & Tennen, H. (2004). Appraisal-coping goodness of fit: A daily Internet study. *Personality and Social Psychology Bulletin, 30*, 558-569.
- Pascoe, M. C., Hetrick, S. E., & Parker, A. G. (2020). The impact of stress on students in secondary school and higher education. *International Journal of Adolescence and Youth, 25*(1), 104-112.
- Podina, I. R., Cosmoiu, A., Rusu, P., & Chivu, A. (2020). Positive Thinking is Not Adaptive Thinking: A Cognitive-Behavioral Take on Interpretation Bias Modification for Social Anxiety. *Journal of Rational-Emotive & Cognitive-Behavior Therapy, 1-21*.
- Putwain, D. W. (2007). Test anxiety in UK schoolchildren: Prevalence and demographic patterns. *British Journal of Educational Psychology, 77*(3), 579-593.
- Putwain, D., & Daly, A. L. (2014). Test anxiety prevalence and gender differences in a sample of English secondary school students. *Educational Studies, 40*(5), 554-570.

Putwain, D. W., von der Embse, N. P., Rainbird, E. C., & West, G. (2021). The development and validation of a new Multidimensional Test Anxiety Scale (MTAS). *European Journal of Psychological Assessment*, 37(3), 236.

Reeve, J. (2014). *Understanding motivation and emotion*. John Wiley & Sons.

Reiss, N., Warnecke, I., Tolgou, T., Krampen, D., Luka-Krausgrill, U., & Rohrmann, S. (2017). Effects of cognitive-behavioral therapy with relaxation vs. imagery rescripting on test anxiety: A randomized controlled trial. *Journal of Affective Disorders*, 208, 483-489.

Rothman, D. K. (2004). New approach to test anxiety. *Journal of College Student Psychotherapy*, 18(4), 45-60.

Safeer, U., & Shah, S. A. (2019). Effect Of Test Anxiety on Academic Achievement of University Students. *Pakistan Journal of Physiology*, 15(2), 76-79.

Satterfield, J. M. (2008). *A Cognitive-Behavioral Approach to the Beginning of the End of Life, Minding the Body: Facilitator Guide*. Oxford University Press.

Shilling, T., Ferguson, H., & Joseph, J. (2020). Teaching Students Metacognitive study skills for success in education.

Szabo, A., Ward, C., & Jose, P. E. (2016). Uprooting stress, coping, and anxiety: A longitudinal study of international students. *International Journal of stress management*, 23(2), 190.

Seif, Ali Akbar. (2013). *Modern educational psychology*. Tehran: Agah Publications

Sansgiry, S. S., Bhosle, M., & Sail, K. (2006). Factors That Affect Academic Performance Among Pharmacy Students. *Pharmaceutical Education*, 104.

Sapp, M. (1999). *Test Anxiety: Applied Research, Assessment, and Treatment Interventions* (2nd ed ed.): University Press of America, Lanham, MD.

Shin, W., Kim, K., Serraz, B., Cho, Y. S., Kim, D., Kang, M., ... & Kim, E. (2020). Early correction of synaptic long-term depression improves abnormal anxiety-like behavior in adult GluN2B-C456Y-mutant mice. *PLoS biology*, 18(4), e3000717.

Seligman, M., Walker, E. F., & Rosenhan, D. L. (2010). *Abnormal psychology* (4th ed ed.). New York: W.W. Norton & Company, Inc.

Spielberger, C. D., & Vagg, P. R. (1995a). *Test anxiety: Theory, assessment, and treatment*. Washington, DC: Hemisphere/Taylor & Francis.

Spielberger, C. D., & Vagg, P. R. (1995b). *Test anxiety: Theory, assessment, and treatment*. Washington, DC: Taylor & Francis.

Stein, D. J., & Nesse, R. M. (2015). Normal and abnormal anxiety in the age of DSM-5 and ICD-11. *Emotion Review*, 7(3), 223-229.

Taconis, R., Ferguson-Hessler, M. G. M., & Broekkamp, H. (2001). Teaching science problem solving: An overview of experimental work. *Journal of Research in Science Teaching*, 38(4), 442-468.

ur Rehman, S., Javed, E., & Abiodullah, M. (2021). Effects of Test Anxiety on Academic Achievement at Secondary School Level in Lahore. *Bulletin of Education and Research*, 43(3), 67-80.

VanKim, N. A., & Nelson, T. F. (2013). Vigorous physical activity, mental health, perceived stress and socializing among college students. *American Journal of Health Promotion*, 28(1), 7-15.

von der Embse, N., Jester, D., Roy, D., & Post, J. (2018). Test anxiety effects, predictors, and correlates: A 30-year meta-analytic review. *Journal of affective disorders*, 227, 483-493.

Wang, L. C., Li, X., & Chung, K. K. H. (2021). Relationships between test anxiety and metacognition in Chinese young adults with and without specific learning disabilities. *Annals of Dyslexia*, 71(1), 103-126.

Yusefzadeh, H., Iranagh, J. A., & Nabilou, B. (2019). The effect of study preparation on test anxiety and performance: a quasi-experimental study. *Advances in medical education and practice*, 10, 245.

Zeidner, M. (1998). *Test Anxiety: The State of the Art*: Springer.

THE VALIDATION OF A QUESTIONNAIRE OF OMANI EFL COLLEGE STUDENTS' PERCEPTIONS OF A GRAMMATICAL INTONATION MODULE

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ABSTRACT

Guided by the ADDIE Instructional Design model, a 7-week online module was designed to enhance the grammatical intonation competency of foundation students at the University of Technology and Applied Sciences (Oman). The module was conducted with 35 level four foundation students, after which the researchers developed a questionnaire to investigate the sample students' perception of the effectiveness of the grammatical intonation module. This paper assessed the validation of the questionnaire using the experts' validity and the Rasch Model analysis of construct validity and reliability. The questionnaire investigates Omani EFL students' perceptions of a grammatical intonation module designed and applied to enhance their grammatical intonation competency. The sample of this study comprised 30 Omani EFL male and female non-major college students studying at the foundation program/the English language center/the University of Technology and Applied Sciences/Nizwa college. The experts validated the contents of the questionnaire. At the same time, the Rasch Model produced construct validity and reliability measurements using the dimensionality, item fit, and item polarity parameters and the person and item separation analysis. The study's findings indicated that the questionnaire is valid and reliable for measuring Omani EFL college students' perceptions of a grammatical intonation module.

Keywords: psychometric analysis, Rasch model, perceptions, grammatical intonation, module.

Introduction

Intonation is a supra-segmental feature (Anh-Thu,2018; Ladefoged and Johnson.,2015). It consists of patterns of pitch changes that occur in parts of the sentences we utter when we speak (Romero,2019). These changes in pitch patterns can convey different meanings for the same sentences (Seenak,2017).

Intonation has several functions, among which is the grammatical function. The grammatical function of intonation specifies the syntactic part played by a word or a phrase in the context of a specific clause or sentence (Zulfugarova, 2018). In English, the grammatical function of intonation shows a word's position in a sentence (Nagendra, 2018). This function could be employed to specify the grammatical structure; it has the same role that punctuation does in writing. It marks where a sentence starts and where it ends. Although the grammatical function of intonation is complex in teaching, it is essential for daily communication in which sentences that are potentially ambiguous in their spoken form as identified by grammatical intonation (Zulfugarova, 2018). The intonation patterns differentiate the syntactic structures and sentence types (statements vs. questions). For example, a rising contour assigns items preference to the falling one, often given with statements. Furthermore, intonation disambiguates miscellaneous grammatically ambiguous structures (Wells, 2006).

In retaining the importance of grammatical intonation in ELT, various instruments have been developed and used to assess the perception and production levels of English intonation of EFL learners during the past three decades (Hamarash,2018). Other instruments were developed to investigate the effectiveness of courses and programs for EFL intonation (Zulfugarova,2018). However, creating an instrument requires knowledge about the items' or questions' constructs, validity, and reliability of the instrument and its scores (Mofreh et al., 2020, 2018,2014). Instruments that include a rating scale are seen as a standard valid method for collecting data about specific types of educational, social, and behavioral constructs (DiStefano & Jiang, 2020). Although reliable results are obtained from the validation analysis using the conventional method, two critical issues come into view from the calculation. The first issue deals with applying an ordinal scale to explain the construct (Ma'ruf et al., 2016). DiStefano and Jiang (2020) stated that when validating a questionnaire, many researchers prefer to sum item responses to get a total score and indicate the construct of interest. This action is hard to give ground for the extent to which the summed scores fail to provide adequate consideration to items (Ibid.). Wright (1992, cited in Kreijns et al., 2020) added that the summed scores are not linear, and the interval of two consecutive total scores may not be equal. This inequality has resulted in short gaps in the data. The second issue concerns the failure of the validation method to investigate the sample's ability level and to explore the single latent construct (Ibid.). Van Zile-Tamsen (2017) assumed that the conventional method includes restricted opportunity to address the role of individual items and assess the items' effectiveness regarding the target population and their contribution to the evaluation of the entire latent construct.

Concerning the above discussion, previous literature (Thakur, 2020; Al Yaqoobi et al.; AL-Mahrooqi, 2018; Hamarash et al., 2018; 2016; AL-Abri, 2016; Al-Humaidi et al., 2014; Al Dilaimy, 2012), concluded that Omani EFL college students suffer from noticeable grammatical intonation deviations and deficiency. They are in dire need of remedial work to boost their grammatical intonation competency. Hence, the researchers developed a questionnaire to assess Omani EFL students' perceptions of a grammatical intonation module (SQPGIM) designed and applied to enhance their grammatical intonation competency. This study also intends to validate the (SQPGIM) by employing the experts' validity and the Rasch Model analysis of construct validity and reliability.

Objectives of the Study

Thus, this study aims to:

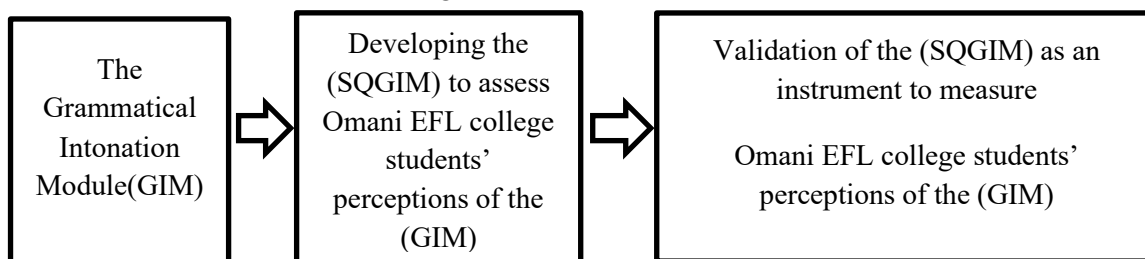
- Apply experts' validity to examine the content validity of the SQPGIM as an instrument used to explore Omani EFL students' perceptions of a grammatical intonation module.
- Use the. RM analysis is a powerful tool for assessing the construct validity and reliability of the SQPGIM to validate it as an instrument.

However, the research questions of this paper are:

- To what extent does the experts' validity validate the SQPGIM?
- Do the items of the SQPGIM have adequate fit statistics, showing that each item relates to the variable and measurement tool in a meaningful way?
- Does the SQPGIM scale demonstrate high separation and good reliability in person and item sets?

The conceptual framework of this research, as shown in figure 1, presents the proposed relationships between grammatical intonation as an independent variable and the development of the (SQPGIM) as the dependent variable. The use of Rasch model analysis as a validation tool is suggested to achieve the validity and reliability of the (SQGIM)(Mofreh et al., 2020, 2018,2014).

Figure 1 Research Framework



Literature Review

The current study examines the psychometric characteristics of a questionnaire that investigates Omani EFL students' perceptions of a grammatical intonation module. (SQPGIM). To this end, it is critical to shed some light on the psychometric characteristics of the Rasch Model and comprehend the concept of grammatical intonation and its application in English language teaching.

Rasch Model Analysis as a Validation Tool

Rasch model is a psychometric model for testing categorical data, such as answering questions on an assessment or questionnaire responses. Thus, the Rasch model is used to analyze the data from instruments to measure the variables that are not measured directly, such as the characteristics of ability, attitude, and personality. In the Rasch Model, the probability of a specified response (e.g., right/wrong answer) is modeled as a function of person and item parameters (Bond & Fox, 2007). Rasch model analysis is a powerful tool for evaluating construct validity.

The most common practice in scale development consists of administering a group of items intended to measure the same construct and subsequently aggregating the responses to form a total scale value. (Mofreh,2014). These items should be equally weighted in the summation and treated as if they fall on an interval scale (Kindlon et al., 1996) to ensure that all items are equally important in assessing the construct. Moreover, reliability of scores, number of underlying constructs, and scale construction practices must empirically evaluate the assumptions of equal-item weighting. Rasch Model (RM) is a model that acts for the structure which data should exhibit to obtain measurements; i.e., it provides a criterion for precise measurement (Bond & Fox, 2007).RM analysis is a powerful tool for evaluating construct validity and reliability. Rasch fit statistics indicate the construct measures irrelevant variance, and the gaps on the Rasch item-person map are indications of construct under-representation.

There are essential aspects of RM measurement that were considered to understand the interpretations of the analysis of its results:

Validity

According to Rasch Measurement Model, the questionnaire validity refers to analyzing the output. The primary output is the polarity item as a measurement point correlation coefficient, known as the point-measure correlation coefficient (PTMEA Corr). The item polarity is also the early detection of construct validity (Bond & Fox, 2007).

Item Polarity

It means that the consistency of the items is an indicator used to show the items move in one direction to which the constructs are being measured. A positive indicator shows that all things are moving parallel to measure the constructs formed. (Linacre, 2003). Item polarity or point measure correlation (PTMEA Corr.) in the early detection of construct validity (Bond & Fox, 2007).

Dimensionality

Dimensionality aspects are essential for determining whether the instrument was measured in one direction and one dimension (Linacre, 2003; Bond & Fox, 2007; Wu & Adams, 2007). Dimensionality refers to the forcing on one attribute or dimension at a time. The dimensionality criteria exceed 40 % (Linacre, 2003; Bond & Fox, 2007).

Rating Scale Analysis

One of the significant aspects of RM is determining the probability of participant responses equally spread between the scales. RM can differentiate among scales of an instrument based on data gathered. (Linacre, 2003; Bond & Fox, 2007). Not all scales can be used for RM. If the structure calibration is less than 1.40 and more than five, this scale should be collapsed (Linacre, 2003; Bond & Fox, 2007).

Reliability

Item reliability indicates that the items will behave similarly even when given to a different sample. Person reliability refers to the consistency of person ordering that can be accepted if this sample of persons were given a parallel set of items measuring the same construct (Wright & Masters in Samah, 2014). The accepting criteria in the Rasch model exceed 0.50 (Bond & Fox, 2007)

Item separation

Item separation indicates that all participants can answer all items' difficulty levels. That means the participants can be separated based on measured constructs. The criterion for the usefulness of an instrument is exceeding its item separation (Linacre, 2007).

Item and Person Reliability

Item and person reliability will refer to the consistency of item placement along the pathway if these items give another sample of the same size that behaved the same way. Person reliability, on the other hand, refers to the consistency of person ordering that could be accepted if this sample of persons were given a parallel set of items measuring the same construct (Linacre, 2007; Bond & Fox, 2007).

Infit and Misfit

Infit refers to the degree of fit of an item or a person. Infit means square is the transformation of the residuals, the difference between the predicted and observed for easy interoperation. Its expected value is 1. As a rule of thumb, values between 0.70 and 1.30 are generally acceptable. Values greater than 1.30 are misfitting, and those less than 0.70 are overfitting (Bond & Fox, 2007). Another values suggested by Linacare (2005) is $0.5 < x < 1.5$.

Grammatical Intonation

Intonation is a remarkable characteristic of spoken language. It contains a continuous pitch change and a variation of a speaker's voice to convey meaning (Asghar,2013, Cardinali,2018 Bataineh et al., 2020). Intonation has many functions, such as grammatical, discourse, attitudinal, accentual functions, etc. Zulfugarova (2018) stated that intonation's grammatical part could help identify grammatical structure in speech. It performs a role similar to punctuation in writing. It can also identify clause and sentence units and contrasts questions/statements. Roach (2008) added that grammatical intonation helps language speakers and learners to realize the grammar and syntactic structures, e.g., boundaries between phrases, clauses, and sentences. It also clarifies the differences between questions and statements, the intricacies of grammatical subordination, grammatical intonation, and its relation to grammatical mood (question/statement, etc.) and modality (possibility, validity, etc.). Grammatical intonation is a function employed by English intonation to give the various grammatical structures their melody and impact on the flow of speech. It is related to the phenomena of intonation, such as tense, number, mood, and disambiguation of sentences (Roach,2009). The grammatical forms of the utterances highly influence intonation as speakers tend, mainly by tone, to use intonation to tell apart clause sorts, like question vs. statement, and to clear up numerous grammatically ambiguous structures (the syntactical function) (Naranjo,2020).

Methodology

This study is a pilot study that aims to test the validity and reliability of the SQPGIM questionnaire. The SQPGIM was developed to investigate Omani EFL college students' perceptions of the worthiness of training intervention sessions in the form of a grammatical intonation module. The sample was given a consent form to sign to guarantee their voluntary participation and withdrawal from the pilot study. The sample of this pilot study was 30 male and female Omani EFL non-major college students (n=20) who were studying at the foundation program/the English language center/the University of Technology and Applied Sciences/Nizwa college. The current study adopted the purposive sampling technique, a non-probability technique (Taherdoost, 2016). This sampling method requires researchers to have prior knowledge about the purpose of their research so that they can appropriately select and approach eligible participants.

The sample group has first been exposed to the ' grammatical intonation module' for seven weeks of 3 sessions a week, i.e., 21 sessions of intonation training and patterns production

of grammatical intonation in which they were trained to produce the intonation patterns of Yes/No questions, WH questions, tag questions, favorable sentences, negative sentences, exclamatory sentences, and imperative sentences. Then, the sample was given the SQPGIM and requested to respond to all of its items. The researchers conducted the students' questionnaire SQPGIM face-to-face with the participants after exposing them to eight sessions of the grammatical intonation module. In this study, experts' validity was employed to obtain the content validity of the SQPGIM. In addition, the Rasch analysis measures the construct validity and reliability of the items of the students' questionnaire SQPGIM.

The Questionnaire of Students' Perceptions of a Grammatical Intonation Module (SQPGIM)

The students' questionnaire SQPGIM was developed to investigate Omani EFL college students' perceptions of the 'grammatical intonation module-GIM'. The GIM involved episodes of sitcoms as training material to create Omani EFL college students' grammatical intonation production of Yes/No questions, WH questions, tag questions, favorable sentences, negative sentences, exclamatory sentences, and imperative sentences. The items of the SQPGIM focused on asking the students if they thought the training intervention improved their production of grammatical intonation of each of the mentioned grammatical structures and if they found the training valuable and motivated. The SQPGIM was adopted from Park (2001) and adapted to match the current study's goals and procedures. Students illustrated their perceptions of the effect of the training intervention. It was developed following ADDIE instructional design steps as analyze, design, develop, implement, and evaluate.

Table1: Specification table of the items of the students' questionnaire

Function	Item	Resources
Intonation exposure	1, 2, 3 & 4	Roach, 2002; Park, 2011; Ahmed, 2005; Hamid, 2018; Hamarish et al., 2018.
Module sessions	5, 6, 7, 8, 9, &10	Roach 2002; Park, 2011; Ahmed, 2005; Hamid, 2018; Hamarish et al., 2018.
Improvement of intonation patterns' production	11, 12, 13, 14, 15, 16, 17, 18 &19	Roach 2002; Park, 2011; Ahmed, 2005; Hamid, 2018; Hamarish et al., 2018.
Follow-up tasks effects	20,21&22	Roach 2002; Park, 2011; Ahmed, 2005; Hamid, 2018; Hamarish et al., 2018.
Feedback sufficiency	23	Roach 2002; Park, 2011; Ahmed, 2005; Hamid, 2018; Hamarish et al., 2018.
Training adequacy	24 &25	Roach 2002; Park, 2011; Ahmed, 2005; Hamid, 2018; Hamarish et al., 2018.

The SQPGIM consists of 24 items employed to assess six constructs (intonation exposure, module sessions, improvement of intonation production, follow-up task effects, feedback sufficiency, and training adequacy). Table (1) shows the specifications adopted in the construct of the grammatical intonation module as an initial step to ensure content validity.

The Validity of the SQPGIM

Heale et al. (2015) explained the term 'validity 'as the extent to which the instrument measures what it is intended to measure. However, in this study, content or experts' and

construct validity were assessed. The students' questionnaire SQPGIM was pilot tested for experts' validity and the Rasch model analysis of construct validity and reliability to reach its final version administered to the sample students. The SQPGIM was developed based on the standard criteria for RM analysis.

The Experts' Validity

In answering the research questions of the current study, it is essential first to achieve the content validity of the SQPGIM that explores Omani EFL college students' perceptions of the grammatical intonation module. The (SQPGIM) was given to a group of specialists in Linguistics, Phonetics, Testing, English literature, and ELT to obtain their experts' validation and approval. The experts pointed out that the questionnaire items must shed light on Omani EFL college students' grammatical intonation intelligibility rather than accuracy (see appendix 7). The content validity index computed experts' approval before the (SQPGIM) was pilot tested for construct validity and reliability to reach its final version administered to the sample students. The experts were asked to give their opinions, modifications, or any addition to the (SQPGIM). This selected group of specialists has long years of experience teaching English at the university level in Oman, which makes them able to professionally examine the research instruments (Appendix 7 shows a list of members).

The experts' comments were mainly on the clarity of the (SQPGIM) in terms of language structure and vocabulary. One expert suggested the possibility of adding the acoustic-phonetic analysis in the (SQPGIM) used in assessing the '7-week online module'. However, other specialists did not highlight this point. Thus, the researchers did not consider it. Five experts removed one item of the (SQPGIM) as it was judged invalid. They indicate that it did not match the objectives of the current study.

The Rasch Model Analysis of the SQPGIM

Construct Validity

Quantitative data of the SQPGIM was analyzed using Rasch model analysis (Winsteps version 3.68.2) to test the questionnaire items' validity. Item polarity or point measure correlation (PTMEA Corr.) is an early detector of construct validity (Mofreh,2014; Bond and Fox, 2007). The analysis of the appropriateness and inappropriate items of the questionnaire was reformed using constructs one by one. Item measure can list the logit measurement information for each item-

The Reliability

To achieve the aims of this study, Person and Item reliability were tested using the criteria of the Rasch Model analysis (Mofreh,2014). Thus, the consistency of item placement can prove if these items are to be given to another sample of the same size that behaved the same way and could be accepted if this sample of persons were given a parallel set of items measuring the same construct (Linacre, 2007; Bond & Fox, 2007).

The Findings

Validity Analysis

The SQPGIM was judged valid by the experts by using the percentage of agreement, which means 100% agreement. The researchers modified the SQPGIM according to the expert's comments. The content validity index computes experts' approval. RM analysis was applied to test the construct validity of the SQPGIM. The RM analyses were based on dimensionality, item polarity, item fit, calibration scales, and psychometric properties criteria. Appendix 2 shows a good item correlation and item fit for the questionnaires. These findings signified that all the items were appropriate for further statistical analysis and inference. The MNSQ for all items does not exceed two or less than 0.4, the (ZSTD) value of item 22 exceeds 2 to 2.5, and its CORR value is negative; thus, it must be deleted through its MNSQ value is within the range. In addition, the CORR of item 23 is negative. However, its MNSQ and Zstd values are within the field.

The dimension of the SQPGIM's constructs was detected using dimensionality analysis of RM. The significance of 'Dimensionality' is in determining that the instrument was measured in one direction and one dimension (Mofreh, 2014; Bond & Fox, 2007). In Rasch analysis, a good dimensionality is determined by natural variance explained by measures which should be more than 40% and unexplained variance in 1st contrast, which should be ≤ 15 . Appendix 2 shows raw variance explained by measures is 32.1%, and the unexplained variance in 1st contrast was 10.6 %. Thus, dimensionality data results indicate that the students' questionnaire SQPGIM data fits the RM, as illustrated in appendices 2 & 3.

A scale of five categories was used for the students' questionnaire that contained 1=Strongly agree, 2= agree, 3= neutral, 4=disagree, and 5=strongly disagree. In the column arrangement observation, (observed count) showed the respondents' answers given to the ranking scale. The most frequent response was the scale of respondents ranking 1 (15 %). The next grading scale that respondents selected was scale 3 (7%). Scale 4 had (4%) respondents, while the least grading scale of least were scales 2 and 5 with 9(2%) respondents. The observed averages showed the pattern of respondents. A reasonably regular pattern is expected with a systematic instrument from negative to positive through different values. There are no too difficult or too easy items for the item map analysis. All items are within the medium range.

Reliability Analysis

Reliability analysis was calculated and conducted following the RM analysis with 24 items for the SQPGIM questionnaire among 30 Omani EFL college students. The criteria for accepting reliability in RM exceeds 0.50 (Mofreh, 2014; Linacre, 2007; Bond and Fox, 2007). In addition, acceptable separation should be more than 2 (Fisher, 2007). The RM analysis measures the reliability and separation of items and persons. This statistic indicated the capability of the items to separate persons with different levels of the concept measured. The person reliability value is .69, and the person separation is 1.50, meaning that it is one separation level and the questionnaire takers were from the same homogenous group. It also showed that the item reliability value is 90, which is high, and the item separation value is three, meaning that items have various factors to

measure. Therefore, the results of person and item reliability and person and item separation for the students' questionnaire illustrated good readability. Analysis of the study showed the reliability of 30 respondents with 24 items in these constructs was high. Thus, the reliability of item and person for students' questionnaire values were reasonably close, representing a solid acceptable level.

Shedding light on the pilot study results, it is clear that the SQPGIM is valid and reliable, and its dimensionality is, to some extent, acceptable. The item map indicates that all of the questionnaire's items are within the same range of difficulty. However, the item fit analysis illustrates that item 22 must be deleted, and this, to the best of the researchers' knowledge, might be because the vocabulary used in the item is difficult for the sample of Omani EFL college students to comprehend. Thus, this item will not be deleted. Instead, the vocabulary used will be changed.

Chan and Subramaniam (2020) stated that the assessment of an item and person separation reliability needs to be performed in connection with the evaluation of the unidimensionality aspect of the Rasch model. This assessment indicates the potential reproducibility of item and person locations on the latent traits continuum (Chan & Subramaniam, 2020; Colledani et al., 2020).

The analysis of Rasch reliability resulted that the SQPGIM scale and subscales had a very high level of internal consistency ($\alpha \geq .90$) (Cohen et al., 2018). In other words, the person-level reliability of the SQPGIM scale and subscale maintains a sufficient level of generalizability of the measurement to new samples (Van Zile-Tamsen, 2017). Besides, item separation was viewed to have a high level of reliability for the subscales. The SQPGIM global scale and subscales have a high level of person separation reliability. Regarding the separation indexes, the item and person separation index values indicated sufficiency (Kreijns et al., 2020). The person separation values also suggest that the SQPGIM scale and subscales could distinguish between the high and lower performance of the responding person sample (Linacre, 2018).

Data Tabulation

The data obtained from the pilot study was converted into an Excel file and coded. Information related to the participants' identities was kept anonymous. The raw data then was converted into logits (or log-odds unit) scores (Yu, 2020, p. 56). Colledani et al. (2020) mentioned that the conversion enables the Rasch model to obtain measurement units at the same interval size, and the length between any two measures will be meaningful. The current study converted raw data into logit values using a WINSTEP application.

Assessment of Uni-Dimensionality

The assumption of Rasch analysis that deals with the uni-dimensionality characteristic of a measure viewed a measure as unidimensional for its ability to measure a single construct or concept (Yu, 2020). The SQPGIM uni-dimensionality aspect was assessed by evaluating the Principle Component Analysis (PCA) of residuals for the broad scale of SQPGIM and each sub-scale. PCA evaluation is intended to specify a particular association pattern among the SQPGIM constructs and identify the number of components that explain the maximum

variance in the data (Colledani et al., 2020). These findings indicate that SQPGIM fits the Rasch model, providing statistical evidence of a uni-dimensionality measurement of the scales for both the global scale and the subscales. In other words, the SQPGIM primarily measures Omani EFL students' perceptions of a grammatical intonation module. The SQPGIM subscales mainly measured the intonation exposure, module sessions, improvement of intonation patterns' production, follow-up task effects, feedback efficiency, and training adequacy.

Discussion

The SQPGIM is an instrument developed to investigate Omani EFL college students' perceptions of a grammatical intonation module GIM. The GIM aims to enhance its production of the intonation patterns used in producing seven English grammatical structures. To validate the SQPGIM, expert and content validity and person and item reliability were employed. The experts' rationality is essential when validating the contents of instruments to obtain successful measurement (Norhayati,2021). In addition, assessing the psychometric properties is critical for instruments as reliable and valid measurement tools (Mofreh, 2020). Thus, analyzing the psychometric properties of a scale enables its location and modification for use in the local context. This paper attempts to validate SQPGIM as an instrument. The items of the SQPGIM were identified according to theory and evaluated according to the Rasch Measurement Model using Winsteps software. As a psychometric study, this study intended to validate the SQPGIM as an instrument.

Based on the results obtained, the SQPGIM proves to be valid and reliable and employed as an instrument that assesses Omani EFL college students' perceptions of the GIM. Rasch analysis results indicated that the SQPGIM showed good overall fit, item fit, targeting, and internal consistency. Therefore, all items had ordered thresholds, no response dependence, unidimensional items, and no evidence of differential item functioning. The current study supports the conclusion of Norhayati et al. (2021), Mofreh et al. (2020), Hugquist (2017), and Shea (2009). It showed that the experts' validity is an effective procedure through giving the instrument to a group of experts for assessment and improvement. The Rasch model analysis is sufficient in measuring the items of scales of perceptions, attitudes, or abilities. They show the probability of an individual getting a correct response on a test item. The Rasch model is more straightforward and more intuitive than many other models. It resembles a ruler in which the scale is measured with "items." Less complicated items are to the left, and more complicated items are to the right.

Conclusions

The questionnaire of students' perceptions of the grammatical intonation model (QSPGIM) is pilot tested among Omani EFL college students. The selected students are studying in the foundation program. They are found valid after trying for the experts' validity and the RM analysis of construct validity of item fit statistics, dimensionality, and polarity to confirm their validity. Moreover, the RM analysis obtained the reliability of the SQPGIM by examining the person and item reliability, and the SQPGIM was found reliable. However,

there were limitations to the current study. The targeting of the sample was less than desirable due to the current covid-19 pandemic's physical limitations. A recommendation is for further research as more research is necessary on the practical application of the students' perceptions questionnaire SQPGIM. To the best of the researchers' knowledge, the development and validation of the SQPGIM were not reported elsewhere, suggesting a valuable contribution of the current study to the literature.

References

- AL-Kinany, T., Al-Abri, A and AmbuSaidi, H. (2020). Arab EFL Learner Perceptions of English Phonemes: A Cross-Language Phonetic Interference. *English Language Teaching*; Vol. 15, No. 2; 2022 ISSN 1916-4742 E-ISSN 1916-4750, Canadian Center of Science and Education.
- Anh,-Thu, T. Nguyễn &Đ. Mục Đào. (2017). The acquisition of question intonation by Vietnamese learners of English. *Nguyễn and Đào Asian-Pacific Journal of Second and Foreign Language Education (2018) 3:3* <https://doi.org/10.1186/s40862-018-0044-4>.
- Asghar, J. (2013). Discourse Intonation Vs Grammatical Intonation: Pedagogical Implications English Language Classroom. *Journal of International Scientific Publication: Educational Alternatives*, Volume 11, Part 2 ISSN 1313-2571, Published at: <http://www.scientific-publications.net>.
- Bataineh, K. B., Atoum, M. S., Alsmadi, L. A., & Shikhali, M. (2020). A Silver Lining of Coronavirus: Jordanian Universities Turn to Distance Education. *International Journal of Information and Communication Technology Education (IJICTE)*, 17(2), 1-11.
- Bond, T. G., & Fox, C. M. (2007). *Applying the RM: Fundamental Measurement in the Human Sciences*. Published by Lawrence Erlbaum Associations, Publishers, Marthwah, New Jersey, and London. Chun,2019).
- Cardinali, R. F. & Barbeito, M. C. (2018). Developing intonation skills in English: a systemic functional linguistics perspective. *Global Journal of Foreign Language Teaching*, 8(1), 11-20. <http://doi.org/10.18844/gjflt.v8i1.3222>.
- Chan, M., & Subramaniam, R. (2020). Validation of a science concept inventory by Rasch analysis. In M. S. Khine (Ed.), *Rasch measurement: Applications in quantitative educational research*. 159–178. Springer Singapore. https://doi.org/10.1007/978-981-15-1800-3_9.
- DiStefano, C., & Jiang, N. (2020). Applying the Rasch rating scale method to questionnaire data. In M. S. Khine (Ed.), *Rasch measurement: Applications in quantitative educational research*. 31–46. Springer Singapore. https://doi.org/10.1007/978-981-15-1800-3_3.
- Cohen, L., Manion, L., Morrison, K., & Bell, R. (2018). *Research methods in education* (8th ed.). Routledge.
- Colledani, D., Anselmi, P., & Robusto, E. (2020). Rasch models in the analysis of repgrid data. *Journal of Constructivist Psychology*, 33, 1–21. <https://doi.org/10.1080/10720537.2020.1852461>.
- Eghlidi, M. (2016). Contrastive analysis of English and Persian intonation patterns: an error analysis study on Iranian undergraduate EFL students. *Journal of Applied Linguistics and Language Research*, 3(4), 88-102.
- Fisher, C. (2007). *Researching and Writing a Dissertation: A Guidebook for Business Students*. NJ. Financial Times Prentice Hall Heale, et al. (2015)
- Frota, S.(2015). Intonational variation in Portuguese: European and Brazilian varieties. In Sónia Frota & Pilar Prieto (eds.), *Intonation in Romance*, 235–283. Oxford: Oxford University Press.

Hagquist, C., & Andrich, D. (2017). Recent advances in the analysis of differential item functioning in health research using the Rasch model. *Health Equal Life Outcomes*, 15, 181 <https://doi.org/10.1186/s12955-017-0755-0>.

Huynh-Cam, T., Agrawal, S., Chen, L. and T. Fan, (2021). Using Moodle-Based E-Assessment In English Listening And Reading Courses: A Vietnamese Case Study. *JIRSEA* 19 (2), November/December 2021

Kindlon, D., Wright, B., Raudenbush, S., & Earls, F. (1996). The measurement of children's exposure to violence: A Rasch analysis. *Int. J. Meth. Psych. Res.*, 6, 187-194. [http://dx.doi.org/10.1002/\(SICI\)1234-988X\(199612\)6:43.3.CO;2-A](http://dx.doi.org/10.1002/(SICI)1234-988X(199612)6:43.3.CO;2-A) Ladefoged and Johnson., 2015.

Kreijns, K., Bijker, M., & Weidlich, J. (2020). A Rasch analysis approach to the development and validation of a social presence measure. In M. S. Khine (Ed.), *Rasch Measurement: Applications in quantitative educational research*, 197–221. Springer Singapore. https://doi.org/10.1007/978-981-15-1800-3_11.

Linacre, J. M. (2007). *A User's Guide to WINSTEPS Rasch Model Computer Programs*. Chicago, MESA Press.

Hamarash,p.& H. Muhammad (2018). Teaching Stress and Intonation from Students' Perspective. *Al-Fath Journal*. 74. June. 2018 <http://www.alfatehmag.uodiyala.edu.iq>

Ma'ru f, A., M. Abdul Ghafar& S. Mofreh (2016). Rasch Model Analysis On Teachers' Epistemological Beliefs. *RJSSM*, 5(9), www.theinternationaljournal.org

Mofreh, S., M. Najib Ghafar, D. Hjh Tiawa Awg Hj Hamid , Y. Othman Mydin (2020). Assessing Model Of Teaching Beliefs And Practices: Using Structural Equation Modelling. *JIRSEA*, 18(1), May/June 2020.

Mofreh, S.& M. Najib Ghafar (2018). Developing Lecturers' Teaching Practices Instrument. *Journal of Institutional Research South East Asia*, 16(1) May/June 2018.

Mofreh, S.(2014). Psychometric Properties on Lecturers' Beliefs on Teaching Function: Rasch Model Analysis. *International Education Studies*; 7(11) ISSN 1913-9020 E-ISSN 1913-9039, Canadian Center of Science and Education.

Nagendra, T.(2018). The Role of Intonation in Spoken English. *International Journal of Creative Research Thoughts (IJCRT)* 1802084. www.ijcrt.org.

Park, M. (2001). *Teaching Intonation Patterns through Reading Aloud*. A thesis submitted in partial fulfillment of the requirements for the degree of Master of Arts in Teaching English to Speakers of Other Languages / Portland State University.

Roach, P. (2002). *English Phonetics and Phonology: A Practical Course*. Cambridge: Cambridge University Press.

Roach, P. (2008) *English Phonetics and Phonology: A Practical Course*, UK: CUP, 4th.

Romero, M. (2019). *Self-assessing Intonation through Analytic Rubrics*. Research Report submitted in partial fulfillment of the requirements for the degree of Master in English Language Teaching for

Self-Directed Learning Directed by Rose Dene David Department of Foreign Languages and Cultures Universidad de La Sabana Chía, Colombia October 2019.

Seenak, P. & D. Adunyarittigun. (2017). *Effects of Self-and Peer-assessments on Thai EFL Students' Intonation Learning*. <http://ird.rmutto.ac.th>.

Shea, T. L., Tennant, A. & Pallant, JF (2009). Rasch model analysis of the Depression, Anxiety, and Stress Scales (DASS). *BMC Psychiatry*, 9 (21). <https://doi.org/10.1186/1471-244X-9-21>.

Wells, J. C. (2006). *English intonation: An introduction*. Cambridge, England: Cambridge University Press.

Wiphasi th, H., R. Narumol, and C. Sumalee (2018). The Design of the Contents of an e-Learning for Teaching M.5 English Language Using ADDIE Model. *International Journal of Information and Education Technology*, 6(2), February 2016.

Wu, M. & Adams, R. (2007). *Applying the Rasch model to psycho-social measurement: A practical approach*. Educational Measurement Solutions, Melbourne.

Taherdoost, H. (2016). Validity and Reliability of the Research Instrument; How to Test the Validation of a Questionnaire/Survey in a Research. *International Journal of Academic Research in Management (IJARM)* 5(3), 28-36, ISSN: 2296-1747 © Helvetic Editions LTD, Switzerland www.elvedit.com.

Van Zile-Tamsen, C. (2017). Using Rasch analysis to inform rating scale development. *Research in Higher Education*, 58(8), 922–933. <https://doi.org/10.1007/s11162-017-9448-0>

Yu, C. H. (2020). Objective measurement: How Rasch modeling can simplify and enhance your assessment. In M. Khine (Ed.), *Rasch measurement*. 47–73. Springer. https://doi.org/10.1007/978-981-15-1800-3_4

Zulfuga Rova, R.(2018). The Function of Intonation In The English Language. *Web of Scholar* ISSN 2518-167X.

**Appendix1
The Students' Questionnaire**

Dear student, Kindly read the below statements and tick the option that mainly reflects your opinion.					
Statements	Options				
	1 Strongly agree	2 agree	3 Neutral	4 Disagree	5 Strongly disagree
1-Through the training sessions, I learned how to produce the patterns of grammatical intonation by watching the videos.					
2- Through the training sessions, I learned how to produce the patterns of grammatical intonation by listening to the dialogues of the episodes.					
3- Through the training sessions, I learned how to produce the patterns of grammatical intonation by reading the scripts.					
4- Through the training sessions, I learned how to produce the patterns of grammatical intonation by taking the follow-up tasks					
5- I found the training sessions helpful.					
6- I found the training sessions technically easy to access.					
7- I found the training sessions interesting.					
8- I found the training sessions systematically arranged.					
9- I found the training sessions motivating.					
10-I found the training sessions clear.					
11- The training sessions helped me to understand what is meant by grammatical intonation.					
12-The training sessions helped me produce the Wh questions with the correct intonation patterns.					
13-The training sessions helped me produce the Yes/No questions with the correct intonation patterns.					
14-The training sessions helped me produce the tag questions with the correct intonation patterns.					
15-The training sessions helped me produce positive sentences with the correct intonation pattern.					
16- The training sessions helped me produce negative sentences with the correct intonation pattern.					
17- The training sessions helped me produce the imperative sentences with the correct intonation pattern.					

18- The training sessions helped me produce exclamatory sentences with the correct intonation pattern.					
19- The 'role-play' task helps comprehend and produce the correct patterns of grammatical intonation.					
20-The 'read aloud' task helps comprehend and produce the correct patterns of grammatical intonation.					
21-The 'select' task helps comprehend and produce the correct patterns of grammatical intonation.					
22- The types of feedback given me during the training sessions were adequate.					
23-The training was enough to train me to recognize the various grammatical intonation patterns.					
24-The training was enough to train me to produce the various grammatical intonation patterns.					

Appendix 2

Item Polarity and Item Fit analysis

```

TABLE 10.1 C:\Users\315156.NCT\Downloads\questio ZOU234WS.TXT Jun 30
11:54 2021
INPUT: 30 PERSONS 26 ITEMS MEASURED: 30 PERSONS 26 ITEMS 129 CATS
3.68.2
-----
PERSON: REAL SEP.: 1.46 REL.: .68 ... ITEM: REAL SEP.: 1.52 REL.: .70
-----
ITEM STATISTICS: MISFIT ORDER
-----
|ENTRY  TOTAL          MODEL|  INFIT |  OUTFIT |PT-MEASURE
|EXACT MATCH|          |
|NUMBER SCORE COUNT MEASURE S.E. |MNSQ  ZSTD|MNSQ  ZSTD|CORR.  EXP.|
OBS%  EXP%| ITEM  G |
-----+-----+-----+-----+-----+-----+-----+-----+-----+
| 22  90  30  -.22  .14|1.48  2.3|1.56  2.5|A-.23  .36|
20.0 25.6| CR21_A 0 |
| 9  89  30  -.18  .14|1.33  1.7|1.32  1.6|B .00  .36|
20.0 25.0| CR9  0 |
| 23  82  30  -.25  .16|1.28  1.3|1.26  1.1|C-.07  .31|
26.7 32.8| CR22  0 |
| 24  93  30  -.34  .14|1.21  1.1|1.26  1.3|D .12  .37|
16.7 24.4| CR23  0 |
| 19  71  30  .25  .14|1.18  1.0|1.17  .9|E .12  .34|
16.7 17.9| CR19  0 |
| 25  84  30  -.08  .19|1.15  .8|1.17  .8|F .02  .28|
16.7 28.0| CR24  0 |
| 10  81  30  -.19  .16|1.16  .8|1.14  .7|G .15  .32|
30.0 31.6| CR10  0 |
| 11  91  30  -.30  .13|1.04  .3|1.04  .3|H .34  .38|
26.7 22.9| CR11  0 |
| 6  70  30  .27  .14|1.04  .3| .99  .0|I .32  .35|
23.3 15.9| CR6  0 |
| 12  83  30  .02  .18|1.02  .2|1.02  .2|J .27  .29|
20.0 27.3| CR12  0 |
| 7  79  30  -.09  .14|1.01  .1|1.00  .1|K .35  .35|
33.3 26.8| CR7  0 |
| 20  81  30  -.12  .14| .92  -.3| .96  -.1|L .43  .35|
26.7 28.0| CR20  0 |
| 18  62  30  .45  .16| .96  -.1| .93  -.2|M .34  .30|
20.0 28.0| CR18  0 |
| 17  66  30  .20  .14| .95  -.1| .88  -.4|m .41  .33|
23.3 17.5| CR17  0 |
| 16  72  30  .21  .15| .94  -.3| .95  -.2|n .38  .33|
10.0 22.6| CR16  0 |
| 13  89  30  -.26  .16| .92  -.3| .94  -.2|k .44  .33|
40.0 31.0| CR13  0 |
| 5  58  30  .20  .18| .94  -.2| .91  -.3|j .38  .27|
33.3 28.5| CR5  0 |
| 26  91  30  -.34  .16| .92  -.3| .91  -.4|i .43  .31|
40.0 33.7| CR25  0 |
    
```

Appendix 3

The Item Dimensionality Analysis

INPUT: 30 PERSONS 35 ITEMS MEASURED: 30 PERSONS 33 ITEMS 147
CATS 3.68.2

Table of STANDARDIZED RESIDUAL variance (in Eigenvalue units)	Empirical		Modeled
Total raw variance in observations	40.7	100.0%	100.0%
Raw variance explained by measures	7.7	18.8%	18.6%
Raw variance explained by persons	7	1.7%	1.7%
Raw variance explained by items	70.17	1%	16.9%
Raw unexplained variance (total)	33.0	81.2%	81.4%
Unexplained variance in 1st contrast	3.8	9.4%	11.6%

Appendix 4

Item-Scale Analysis

CATEGORY OBSERVED-LABEL COUNT %	OBSVD SAMPLE SCORE	INFINIT OUTFIT MNSQ MNSQ	CALIBRATION	CATEGORY MEASURE
1 1 10 33	-25 -.34	1.13 1.96	NONE	(-1.35) 1
2 2 6 20	-.35* -.25	.96 1.30	.24	-.53 2
3 3 3 7	-.18 -.19	.10 .06	.91	-.16 3
4 4 4 13	-.04 -.13	.92 1.23	-.82	.12 4
5 5 2 10	-.13* -.08	1.19 1.52	.21	.49 5
6 6 5 17	-.14* -.03	1.33 1.31	-.54	(1.28) 6

Appendix 5

The Reliability of the Questionnaire

PERSONS 30 INPUT 30 MEASURED	INFINIT	OUTFIT
REAL RMSE .17 ADJ.SD .25 SEPARATION 1.50 PERSON RELIABILITY .69		

REAL RMSE .35 ADJ.SD 1.05 SEPARATION 3.00 ITEM RELIABILITY .90		

Appendix 6

Item-map -Analysis

TABLE 12.2 C:\Users\Dell\Downloads\questionnaire ZOU683WS.TXT Jul 27 14:48 2021

INPUT: 30 PERSONS 35 ITEMS MEASURED: 30 PERSONS 33 ITEMS 147 CATS 3.68.2

PERSONS - MAP - ITEMS

<more>|<rare>

```
3  +
   |
   |
   |
   | ST1
   |
   |T
   |
2  +
   |
   | ST5 ST7
   |
   |
   |
   |
   |S
1  +
   |
   |
   |
   | CR18
   |T| CR1 CR14 CR15 CR2 CR4 CR6
   |X| CR16 CR17 CR19 CR3 CR5
   |XXXXX S| CR12
0  XXX +M CR24 CR7 ST2
```



```
XXX | CR10 CR20 CR21_A CR9 ST9
XXXXXXXX M| CR11 CR13 CR22 CR23 CR25
XXXXXX | CR8
X S| CR21
XX |
T|
|
-1 +
|S
X |
|
|
|
|
|
-2 +
|
|T
|
|
|
|
|
-3 +
|
|
|
|
| ST4 ST6
-4 +
<less>|<frequ>
```

Appendix 7

Experts' Comments on the Validity of SQPGIM

Expert	Validity	Comments
1-Prof.Bushra Mustafa	Valid	Include the acoustic-phonetic analysis in the SQPGIM.
2-Dr. Abdullah Alari	Valid	-
3-Dr. Rihana Khuzir	Valid	Try to use sentences and phrases that match students' academic level in terms of grammar structures and vocabulary.
4-Dr. Surya Vellank	Valid	Give students some time to read the questions before answering them questions.
6-Dr. Iman AL-Khalidy	Valid	-
7-Dr. Ourada Khouni	Valid	-
8-Mr. Ishaq AL-Naabi	Valid	Try to use sentences and phrases that match students' linguistic backgrounds.

