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About the Journal

The International Journal on E-Learning Practices (IJELP) (ISSN 2289-4926 / eISSN 2600-7886) is an international peer-reviewed journal. It is also the latest flagship journal of Universiti Malaysia Sabah (UMS). IJELP is the 12th journal of UMS since its establishment on 24 November 1994. IJELP is published once a year. IJELP is published in English and it is open to all local and international authors.

Aims and Scope

IJELP is an online open access journal aimed at disseminating and sharing of e-learning practices to worldwide audience. IJELP accepts manuscripts in the area and sub-area of e-learning such as teaching and learning with technology, mobile learning, e-learning technology and innovation, multimedia-based learning, Computer-Assisted Language Learning (CALL), best practices in e-learning using social networking, PLE, management, assessment, administration and leadership. The journal aims to be indexed by MYJOURNAL and later on with MYCITE after six periodic issues are published.

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Editorial Office
Faculty of Psychology and Education
Universiti Malaysia Sabah, Jalan UMS, 88400 Kota Kinabalu, Sabah, Malaysia
Phone: (6)088-320000 Ext: 2471 Fax No.: (6)088-320268 E-mail: noraini.said@ums.edu.my

EDITORIAL PREFACE

Welcome to Volume 2023 of the *International Journal of e-Learning Practices* (IJELP). IJELP is one of the printed and online open-access journals published by Universiti Malaysia Sabah, Sabah, Malaysia. IJELP is aimed at sharing and disseminating e-learning practices such as teaching and learning with technology, mobile learning, e-learning technology and innovation, multimedia-based learning, Computer-Assisted Language Learning (CALL), best practices in e-learning using social networking, PLE, management, assessment, administration and leadership to a worldwide audience.

For Volume 6 of IJELP, we have a selection of articles covering several stimulating topics related to the applications of ICT, blended learning, Computer Assisted Instruction (CAI), and e-learning practices from overseas and in Malaysia. There are four articles from Vietnam and two articles from China. The articles discussed learning via the use of technologies such as Memrise and flipped classroom techniques. Meanwhile, Malaysian studies cover an interesting array of topics such as creativity techniques in teaching and learning and online lesson plan generation platforms. We are confident that you will find this eclectic choice of topics both beneficial and enlightening for your research and professional development.

We would like to take this opportunity to express our heartfelt thanks and appreciation to several blind reviewers who have contributed their valuable time and effort in reviewing the articles. I also offer my sincere appreciation to all editors for proofreading all the articles submitted for this volume. We hope to seek your continued support and assistance in helping us to publicise IJELP to your colleagues, friends, and graduate students.

Sincerely,
Volume 6, 2023
Editor-in-Chief
Dr. Noraini Said

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Contents

Trends in E-learning Implementation in Tertiary Education: A Review of Blended Learning in China and Other Countries

Xianjun Dai[1], Nur Suhaidah Sukor[2], He Sun[3]

[1,2] *Faculty of Psychology and Education, Universiti Malaysia Sabah, Malaysia*
[1]daphnedxj@163.com; [2]nursuhaidahsukor@ums.edu.my

[3]*Faculty of International Education, Qingdao Hengxing University of Science and Technology, China*
785401145@qq.com

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ABSTRACT

Blended learning is a combination of online learning and face-to-face learning. It is an important trend in the development of tertiary education in China and foreign countries. In recent years, the discussion of blended learning gradually moves from theory to practice, and more and more college teachers begin to pay attention to blended teaching design and put it into practice. This study attempts to give an overview on the topic of blended learning in tertiary education, with a comparison of Chinese and global perspectives. By using "blended learning" and "higher education" as the theme word, and through the advanced search function in CNKI (Core of Peking University /CSSCI) and Scopus database, this paper retrieved 356 and 2293 relevant journals respectively from 2004 to 2023. Utilizing a comparative approach, this study compared the retrieved data from CNKI and Scopus, sorted out the research context in China and foreign countries, analyzed the current research hot-spots, research topics and research trends of blended teaching in tertiary education using a comparative approach, and provided references for the future research in this field. The result showed that the research hot-spots includes the effectiveness of blended learning, blended learning models, blended learning strategies, and influencing factors of blended learning adoption. Furthermore, the study demonstrated a shift in research focus, from initial discussions to investigations into its pedagogical implications.

Keywords: blended learning, higher education, online education, teaching design, teaching reform

INTRODUCTION

Today's society is in a technological era characterized by globalization and informatization. All aspects of the living environment on which human beings depend are inseparable from modern science and technology, which deeply affects human cognition of the world, thinking about the phenomena we see and the way of thinking in dealing with problems. In recent years, with the deepening of education informatization and teaching reform, more and more tertiary education have turned from traditional teaching to blended teaching.

Blended learning is a teaching method, combining traditional face-to-face instruction with online learning activities. It aims to make use of the benefits of both methods, offering flexibility and personalized learning experiences. This combination allows students to engage with course materials and interact with instructors and peers both in a physical classroom and through digital platforms, fostering a more dynamic and adaptable learning environment. Blended-Learning is an excellent compromise between e-learning and face-to-face training. It combines their advantages to provide a

more effective and challenging learning environment. The e-learning infrastructure is a key element of the Blended Learning ecosystem, as it hosts the distance learning platform (El Habti, 2022).

It is an important trend in the development of tertiary education in China and abroad. In recent years, the discussion of blended teaching gradually moves from theory to practice, and more and more college teachers begin to pay attention to blended teaching design and put it into practice. By comparing the core journals on blended teaching in CNKI database (Core of Peking University /CSSCI) in China and the journals on blended teaching in Scopus database in foreign countries from 2005 to 2023, this paper sorted out the research context at home and abroad, analyzed the current research hot-spots, research topics and research trends of blended teaching in tertiary education, and provided references for the future research in this field. The search deadline for this study is August 10, 2023.

LITERATURE REVIEW

From its infancy at the end of the 20th century to the present day, it is widely recognized internationally that the development of blended learning has gone through three main stages of evolution.

Stage 1 Theoretical research and technology application (2005-2007)

At this stage, blended learning is still a relatively new concept, and research focuses mainly on theoretical studies of blended learning, teaching models, classroom teaching, and instructional design. The year 2000 was the year of blended learning resentment, first proposed by Cooney et al. in their study of preschool children's education. Definitions of blended learning at this stage emphasize the physical characteristics of blended learning, most notably the Sloan Consortium's definition: "Blended learning is a combination of face-to-face and online instruction, blending two historically separate modes of instruction: traditional face-to-face instruction and online learning (Allen, 2003). It is a combination of online and face-to-face instruction with a percentage of online content (Bonk, et al., 2009). The first formal advocate of blended learning in China is He Kekang. He (2004) used the blend learning (or blended learning) term's basic meaning while giving it a completely new interpretation: the so-called Blending Learning is to combine the advantages of traditional learning and e-Learning (i.e. digital or networked learning), that is to say, to give full play to the leading role of the teacher in guiding, inspiring and supervising the teaching process, and to fully reflect the initiative, enthusiasm and creativity of the students as the main body of the learning process.

A crucial component of blended learning has been the use of e-learning. E-learning played a key role in enhancing the educational process. Traditional face-to-face training was enhanced by the incorporation of online resources, interactive platforms, and multimedia content, allowing students to connect with the material in a variety of ways (Garrison & Kanuka, 2004). Picciano (2006) explored in depth the theoretical basis and technological application of blended learning as an educational model and its positive impact on educational growth and access. He called on educators and policymakers to explore more deeply how to maximize the benefits and overcome the challenges of blended learning to achieve a wider range of learning opportunities. In conclusion, the theoretical research and technological application that characterized the first stage of the evolution of blended learning established the groundwork for the later expansion of this paradigm in education. The incorporation of e-learning and the creative applications of blended learning in many contexts laid the foundation for later improvements and developments.

Stage 2 Technology integration and practical exploration(2007-2013)

After 2007, the definition of blended learning became clearer as research and practice evolved. At this stage, scholars begin to pay more attention to blended learning from the perspectives of teaching strategies and teaching methods, and to the design of teaching and learning in blended learning environments that combine online and face-to-face teaching. Therefore, at this stage, the concept of blended learning focuses on "interaction", the changes brought by the blended learning environment

to interaction, and the corresponding changes in instructional design. The most representative definition is that of Bliuc et al (2007): blended Learning describes a new way of learning that realizes a new way of learning that combines face-to-face (on-site) and online interactions between students and students, students and teachers, and students and resources. Yen and Lee (2011) called blended learning "a fundamental change and redesign of the instructional model" and propose three characteristics of blended learning: (1) a shift from teacher-centered to student-centered; (2) enhanced student-student, student-teacher, student-content, and student-external resource interactions; and (3) the use of an assessment mechanism that combines formative and summative assessment.Vaughn and Garrison (2012) provided in-depth insights into all aspects of applying blended learning in higher education, from theory to practice, from instructional design to technology integration, providing useful guidance and insights for educational practitioners. In summary, convergence of theoretical knowledge and actual application in the field of blended learning occurred between 2007 and 2013. Technology and pedagogical knowledge came together to transform teaching strategies, enhance student relationships, and open up new avenues for innovative instruction in both traditional and online settings.

Stage 3 Deep integration and diversified development (2013-now)

With the rapid development of the Internet and mobile technology, especially the arrival of the "Internet Plus" era, the concept of blended learning has also been newly developed since 2013. The concept of blended teaching has evolved from "the mixture of online teaching and face-to-face teaching" to "the teaching situation based on mobile communication devices, network learning environment and classroom discussion" (Wasoh,2016). The concept of blended learning at this stage emphasizes the "student-centeredness" and Goodyear emphasizes that blending is not only a mix of face-to-face and online instruction, but also a mix of teaching and tutoring styles in a "student-centered" learning environment (Goodyear & Dudley, 2015). Hrastinski (2019) revealed the importance and trends of blended learning in education. Emphasizing the diversity of blended learning, learner-centered approaches, and the critical role of teachers in it, he provides useful insights for educational practitioners to better apply blended learning concepts and strategies. Lim and Graham(2021) noted the importance of blended learning in promoting diversity in higher education in the Asian region. They explored the educational contexts, cultural differences and student needs in different countries and regions, and how blended learning strategies, including flexible learning pathways, adaptive learning resources and pedagogical approaches, could be customized according to these factors to meet the needs of different student populations. Nikolopoulou and Zacharis (2023) investigated university students' blended learning behavior perceptions shortly after the Covid-19. In summary, the current stage of blended learning is characterized by deep integration, technological diversity and student-centered learning. The rapid increase of digital resources, mobile technologies and immersive learning experiences has revolutionized education, paving the way for an era of education that transcends traditional boundaries.

METHOD AND SAMPLING

In order to sort out the research context in China and abroad, analyze the current research hot-spots, research topics and research trends of blended teaching in tertiary education, thereby providing references for the future research in this field, this paper uses the method of documentary analysis and method of comparative analysis, which are used by Liu (2021) in the study *Blended Learning of Management Courses Based on Learning Behaviour Analysis.* This study searches for Chinese and English literature from the CNKI database (Core of Peking University and CSSCI) and Scopus database respectively and made a comparison. The search deadline for this study is August 10, 2023.

Literature selection

In CNKI database, the author used the "blended learning" and "higher education" in Chinese character as the key words and limited the time span from 2005 to 2023. 356 literature were retrieved within Core of Peking University and CSSCI. On Scopus database, the author used the same key words"blended learning" and "higher education" and limited the period from 2004 to 2023, a total of 2293 literature were retrieved.

High citation analysis

In order to further explore the knowledge base of blended learning, the author selected and analyzed the top ten highly cited documents in the citations of related research papers in CNKI database and Scopus database respectively. The period was limited from 2004 to 2023.

High-frequency keyword analysis

The high-frequency keywords of a paper are a high level summary of the research topic. A high-frequency keyword indicates that more research has been conducted on that keyword and it is a research hot-spot. In this paper, the author analyzed the research papers on blended teaching in tertiary education included in the Core of Peking University and CSSCI on CNKI database, and selected the top ten to make an analysis.

Co-occurrence matrix analysis

Co-occurrence matrix analysis is a method used to examine the relationships between items or elements based on their co-occurrence frequencies within a given context. This method entails building a matrix where the rows and columns stand in for various aspects in the cells indicate the frequency or strength of co-occurrences between these elements. In order to better explain and analyze the research theme of blended learning in tertiary education, this paper used co-occurrence matrix analysis method.

Research tools

In this paper, the author has utilized the existing data analysis functions of the database and Python to do the co-occurrence matrix analysis on the topic of blended learning in tertiary education.

FINDINGS AND DISCUSSION

Time distribution of research papers on Blended learning in tertiary education

By August, 2023, 356 literature were retrieved within Core of Peking University and CSSCI in CNKI database, while 2293 literature were retrieved within the Scous database. Time distribution of research papers on blended learning in tertiary education is shown in Figure 1.

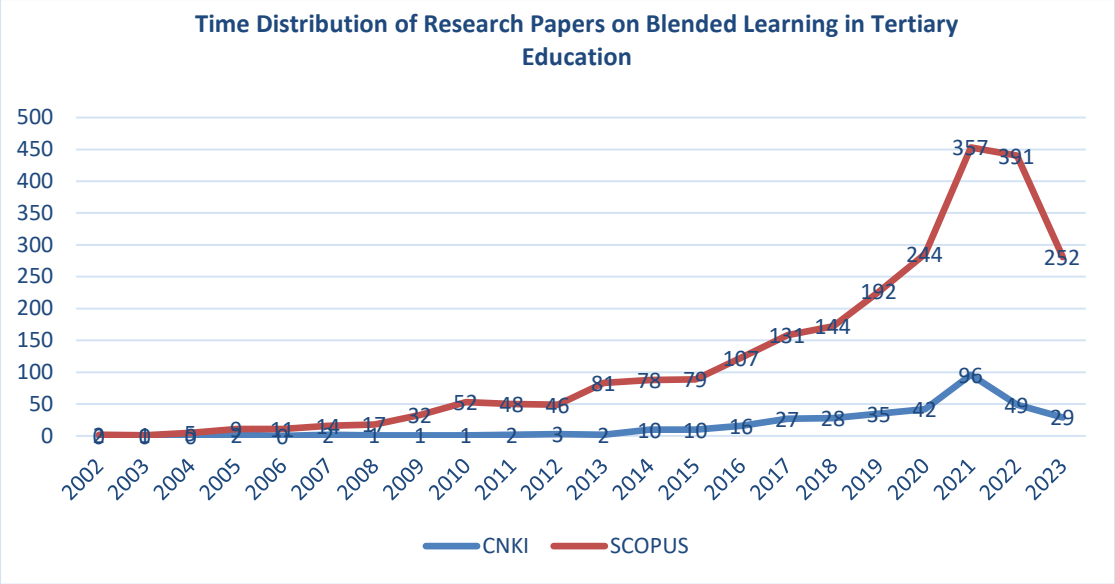

Figure 1 Time distribution of research papers on blended learning in tertiary education

The research on blended learning in tertiary education indexed by Core of Peking University and CSSCI in CNKI and Scopus database started in 2005 and 2006 respectively. Both showed a rising trend and grew particularly rapid from 2020 with the spread of COVID-19 virus (Mayo-Cubero, 2021). Significantly more research has been done abroad than in China. According to the time distribution, research papers on blended learning in tertiary education can be divided into three stages: stage 1 from 2005 to 2007, stage 2 from 2007 to 2013, stage 3 from 2013 to present. During stage 1, fewer papers are published, and blended learning is in the exploratory stage. In stage 2, there was a significant growth of the study relative to the first phase and the studies moved from theory to practice. In the third stage, there was a significant increase in the number of papers published, especially through 2020, when there was a dramatic increase in the number of papers published. At that stage, blended learning in tertiary education is in the stage of diversified development and deep integration.

High citation analysis of blended learning in tertiary education

In order to further explore the knowledge base of the field, this paper analyzes the highly cited literature in the citations of the relevant research papers, and obtains the top ten highly cited frequency papers (Table 1), which are mainly focused on the following aspects:

Theory and design of blended learning

Blended learning learning is an evolving concept. He (2004) used the blend learning (or blended learning) term's basic meaning while giving it a completely new interpretation: the so-called Blending Learning is to combine the advantages of traditional learning and e-Learning (i.e. digital or networked learning), that is to say, to give full play to the leading role of the teacher in guiding, inspiring and supervising the teaching process, and to fully reflect the initiative, enthusiasm and creativity of the students as the main body of the learning process. Yu (2005) pointed blending Learning is a kind of enhancement of the learning concept, which will make the students' cognitive way change, and the teachers' teaching mode, teaching strategy, and role also change. This kind of change is not only a change of form, but also a change of teaching mode and role of teachers. Garrison and Kanuka (2004) defined blended learning as an instructional model that combines face-to-face instruction with online learning. They emphasize the versatility of this model, which allows for different levels of integration depending on specific educational goals and content.

Exploring teaching practice

The practice of blended learning theory and the integration of technology is another hot research topic both in China and foreign countries. Picciano (2009) explored a multi-modal model that emphasizes the integration of different learning modalities and technologies into a blended learning environment to meet the diverse learning needs of students. The authors presented a model that emphasizes the use of both face-to-face and online activities in blended courses for a richer and more flexible learning experience. Huang et al (2009) proposed a design framework for blended learning courses and their activity framework, and gives examples of related course design.

Blended learning design and Influencing Factors

In recent years, more and more college and university teachers have begun to pay attention to blended instructional design and put it into practice. Xie and Zhu (2012) pointed out that blended learning design should incorporate appropriate theories, such as mastery learning theory, primary teaching principles, deep learning theory and active learning theory, to design instruction and build a blended instructional implementation process. Hew and Cheung (2014) reviewed the use of students and instructors in Massive Open Online Courses (MOOCs), including their motivations, challenges, and experiences, while also providing some insight into blended learning design.

Table 1 Highly Cited Papers on Blended Learning Research in Tertiary Education in CNKI, 2005-2023

Citation Number	Title	First Author	Year	Journal
2559	Principles and application models of blended learning	Li Kedong	2004	Chinese audio-visual teaching
1449	A Literature Review on Blended Learning : Based on Analytical Framework of Blended Learning	Feng Xiaoying	2018	Journal of distance education
1271	The Theoretical Basis and Instructional Design of Blending Teaching	LI Fengqing	2016	Journal of Modern Educational Technology
1250	Blended learning based course design theory	Huang Ronghuai	2009	Chinese audio-visual teaching
1236	Rain Classroom: The Wisdom Teaching Tool in the Context of Mobile Internet and Big Data	Wang Shuaiguo	2017	Journal of Modern Educational Technology
2917	New developments in educational technology theory from blended learning	He Kekang	2005	Chinese audio-visual teaching
1114	The Design of New Blended Learning Model Based on Flipped Classroom	Zhang Qiliang	2013	Journal of modern educational technology
1030	Blended Teaching in Network Environment--A new teaching model	Yu Shengquan	2005	Chinese University Teaching
603	Exploration and Practice of Blended Teaching Based on MOOC+SPOC	Su Xiaohong	2015	Chinese University Teaching
316	Factors Influencing Blended Teaching Quality at Higher Education Institutions	Xie Xiaoshan	2012	Distance Education in China

Analysis of Research Hot-spots

The keywords of a paper are a high level summary of the research topic. Keywords with high frequency indicate that more research has been carried out on the keyword, which is a research hot spot. By retrieving 356 journals on CNKI database (Core of Peking University and CSSCI) and Scopus database, this paper analyzes the keywords of the research papers on blended teaching tertiary

education, and obtains the top ten high-frequency keywords in the citation frequency. Figure 2 and Figure 3 show the high-frequency keywords, and the higher frequency means the more likely to become a research hot spot. (1) the design of teaching mode around blended learning effect; (2) the development and teaching design of MOOC and flipped classroom; (3) the influencing factors of blended learning adoption; (4) blended learning strategies.

One difference between CNKI and Scopus high-frequency words: while Chinese studies focus on college ideological and political courses and College English, foreign studies focus on subjects such as medical education. Another difference is that there are gender differences in foreign studies while there are few such studies in China.

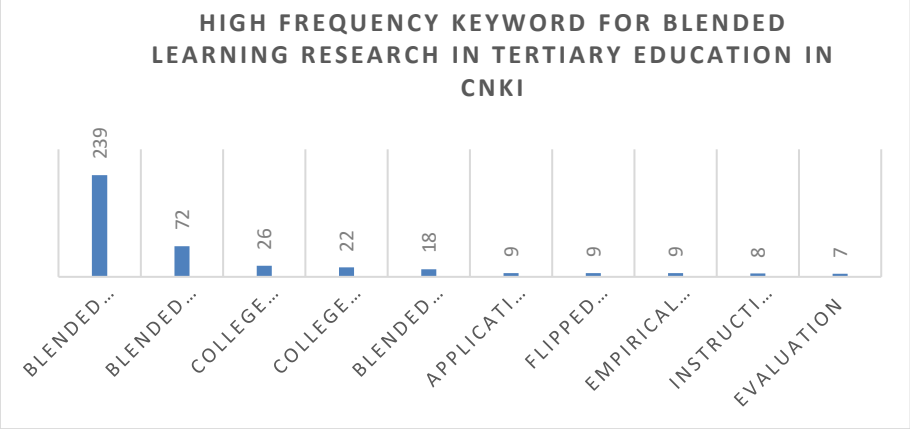

Figure 2 High-frequency keywords for blended learning research in tertiary education in CNKI

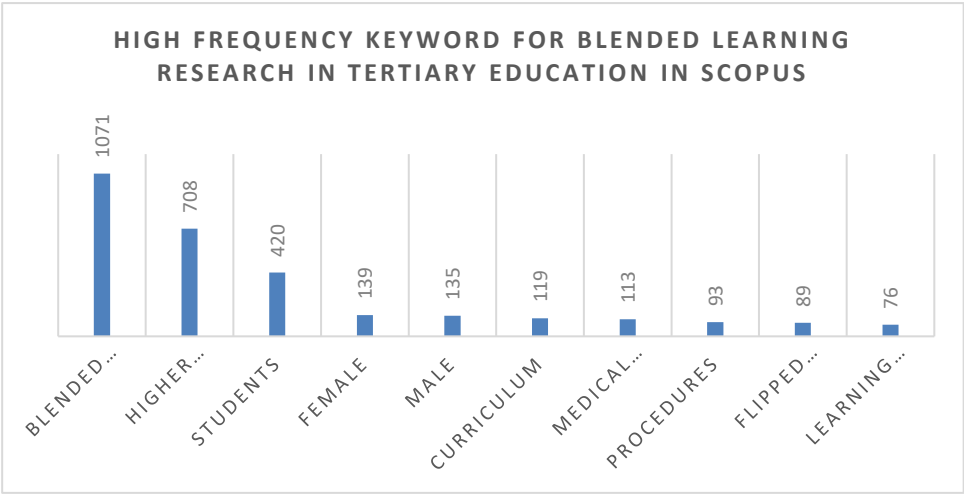

Figure 3 High-frequency keywords for blended learning research in tertiary education in Scopus

Co-occurrence matrix analysis

Co-occurrence matrix analysis is a method used to examine the relationships between items or elements based on their co-occurrence frequencies within a given context. When two keywords appear together in a text, a relationship between them is implied. The connection between the set of terms is higher when the two occur together more frequently. Combining the previous analysis of highly cited papers, high-frequency keyword analysis, and co-occurrence matrix analysis shown in table 3 and table 4, this paper summarized and sorted out the following research topics of blended learning in tertiary education.

Table 3 Co-occurrence Matrix of CNKI Blended Learning in Tertiary Education High Frequency Keywords

	blended learning	blended learning model	college English	college ideological and political courses	blended learning reform	applications in teaching and learning	flipped classroom	empirical research	instructional design	evaluation
blended learning	239	38	22	21	10	3	6	7	6	5
blended learning model	38	72	12	7	0	0	3	0	0	0
college English	22	12	26	0	0	0	0	0	0	0
college ideological and political courses	21	7	0	22	0	0	0	0	0	0
blended learning reform	10	0	0	0	18	0	0	0	0	0
applications in teaching and learning	3	0	0	0	0	9	0	0	0	0
flipped classroom	6	3	0	0	0	0	9	0	0	0
empirical research	7	0	0	0	0	0	0	9	0	0
instructional design	6	0	0	0	0	0	0	0	8	0
evaluation	5	0	0	0	0	0	0	0	0	7

Table 4 Co-occurrence Matrix of Scopus Blended Learning in Tertiary Education High Frequency Keywords

	blended learning	higher education	students	female	male	curriculum	medical education	procedures	flipped classroom	learning system
blended learning	1071	615	231	105	102	46	105	56	83	70
higher education	615	708	241	87	84	75	107	40	43	50
students	231	241	420	79	78	32	78	18	53	62
female	105	87	79	139	87	23	67	29	65	31
male	102	84	78	87	135	23	66	28	66	30
curriculum	46	75	32	23	23	119	6	7	3	0
medical education	105	107	78	67	66	6	113	11	0	0
procedures	56	40	18	29	28	7	11	93	0	0
flipped classroom	83	43	53	65	66	3	0	0	89	0
learning system	70	50	62	31	30	0	0	0	0	76

Research on blended teaching theories and models

The research in this area includes the clusters of blended teaching model, blended teaching, teaching model, online education, and flipped classroom. As early as 2004, some scholars began to conduct research on blended teaching, including the concept of blended teaching and related theoretical foundations. Many researchers have conceptualized blended learning from different perspectives have elaborated on it. Blended learning is based on various information technology platforms, giving full play to the advantages of traditional classroom teaching and online teaching, and mobilizing multiple forms of teaching to serve the teaching system (Tian &Jiao, 2005); blended learning is a kind of enhancement of the learning concept, which makes the students' cognitive style changes, and teachers' teaching mode, teaching strategies and roles are also changed (Yu, 2005); the so-called blending Learning is to combine the advantages of traditional learning and e-Learning (i.e. digital or networked learning), that is to say, to give full play to the leading role of the teacher in guiding, inspiring and supervising the teaching process, and to fully reflect the initiative, enthusiasm and creativity of the students as the main body of the learning process (He, 2004); blended learning as an instructional model that combines face-to-face instruction with online learning (Garrison& Kanuka, 2004).

Based on the deepening research on the concept and theory of blended teaching, more and more scholars have begun to study blended teaching models. Centering on the three basic issues of teaching: purpose, process, and evaluation, Luo (2019) proposed a "two-dimensional trinity" blended teaching model for tertiary education, and designed an eight-phase blended learning process, which provides a reference for blended teaching reform.

Bake (2000) was an early proponent of the idea of the flipped classroom and put it into practice. The flipped classroom is based on cognitive theories such as cognitivism, behaviorism, constructivism, and humanism. By optimizing and decomposing the teaching procedure, students can learn independently outside the classroom through various ways, and the classroom can strengthen teacher-student communication in the classroom, so as to enhance personalized learning and knowledge internalization. The advantages of receptive learning and constructive learning are organically integrated to improve the learning efficiency (Rong & Peng,2015).

Research on blended teaching theories and applications

This area of research includes blended learning, online learning, self-directed learning. Blended learning and blended teaching are two different concepts. Blended learning research focuses on the main body of learning - students, research from the perspective of how to learn; while blended teaching research focuses on how to teach, research from the perspective of teachers. But the two are very closely linked, the theoretical basis is similar, the ultimate goal is to improve the learning effect, but blended learning research is earlier than blended teaching research (Peng & Jin, 2021). It is based on blended learning research that began to constantly explore how to carry out blended instructional design in order to achieve the teaching goals. Research on blended learning theory and practice provides a richer perspective on the study of blended learning.

Research on blended instructional design and practice

Research in this area includes instructional reform, instructional design, and influencing factors. To achieve the desired results, blended learning needs to be combined with the characteristics, objectives, technological environment, methods, processes of blended teaching, and student characteristics to do the teaching design. Li (2016) combined learning theory and the ADDIE model (five steps of analysis, design, development, implementation and evaluation) to design the blended teaching implementation process according to the three phases of pre-course, in-course, and post-course, so as to provide hands-on guidelines and empirical references for carrying out blended teaching. Vaughan (2007) provided perspectives and experiences of different participants (teachers, students, administrators, etc.) on blended learning. It helps to understand how to design and implement blended instruction with the involvement of different roles.

Conclusion

Through the study, it is found that Chinese and foreign research on blended teaching in colleges and universities are similar. Although the number and depth of studies on blended teaching in colleges and universities in China are weaker than those in foreign countries, both studies on blended teaching in colleges and universities are divided into three stages, and the contents of the studies in the three stages are similar. Another difference is that Chinese research on efficient blended teaching mainly focuses on college English courses and Civics courses, while foreign research focuses on medical courses (Saeed, 2022)). Based on previous studies, this paper summarizes the following research trends in blended learning in tertiary education.

First, continue to carry out in-depth research on the theoretical mechanism of blended teaching. Although after more than ten years of research, people have gradually formed some mainstream cognition on blended teaching, but there are still differences in many areas. At the same time, due to the complexity of online behavior, teaching behavior, learning behavior, interaction mode and teaching effect are affected by many uncertain factors, and many rules need to be explored, and the mechanism behind them needs to be further explored.

Second, it studies the applicability and evaluation of blended teaching. At present, the mixed teaching in colleges and universities has different quality of courses and can not reach the expected teaching goal. In the future, combined with curriculum practice, the applicability of blended teaching will be discussed from the aspects of student level, teacher level, curriculum characteristics, technical environment and so on.

Thirdly, it explores the innovative development of blended teaching mode under "Internet + technology". The development of the Internet, big data, cloud platform, AR, and Internet of Things technology provides opportunities for blended teaching. Intelligent and informationization is the trend of future education development, which will certainly have a significant impact on the blended teaching mode and teaching design (Tang, 2023). Finally, research on the influence of blended teaching on individual ability and core quality. To improve the quality of blended teaching, it is necessary to explore the relationship between blended teaching and the cultivation of students' individual ability and core literacy and the realization path.

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Revisiting E-Learning in China: Analysis of TPACK Development in China and Other Countries

[1]He Sun, [2]Nur Suhaidah Sukor, [3]XianJun Dai

[1, 2] *Faculty of Psychology and Education,Universiti Malaysia Sabah, Malaysia, 785401145@qq.com; nursuhaidahsukor@ums.edu.my.*
[3]*Faculty of International Education,Qingdao Hengxing University of Science and Technology, China daphnedxj@163.com*
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Abstract

The development of TPACK for teachers is crucial for the effective use of technology in teaching and the promotion of teacher professional development. TPACK development has become a hot topic in the field of teacher education and educational technology. In order to gain a deeper understanding of the overall situation of current research on teachers' TPACK development and predict the future trend of research, this study used "TPACK" as the theme word to search for relevant literature from the core journals of CNKI database (SCI/EI/Peking University Core/CSSCI/CSCD/AMI) and English journals of Scopus database. 306 and 1095 relevant literature were selected respectively. High-frequency keyword and co-word analysis methods were conducted on the obtained literature. The results showed that the current research hot spots in the TPACK field are current situation investigation and analysis, ability improvement, influencing factors. It is predicted that the future research on TPACK development will tend to focus on interdisciplinary and specialized research, applied practice research, and teacher TPACK ability improvement training research. By comparing the commonalities and differences of TPACK research in China and other countries. it is proposed to shift from universal research to specialized research, and carry out action and experimental research on teacher TPACK ability improvement training courses. And it is necessary to closely follow the digital process of education and carry out research on the framework development of I-TPACK and AI-TPACK to enhance teachers' ability of teaching with technology.

Keywords: *teachers, TPACK , literature, teaching with technology, improvement*

INTRODUCTION

With the rapid development of global informatization, improving teaching efficiency through information technology has become a current trend in education development. Traditional classroom education is shifting towards e-learning. At present, blended teaching combining e-learning and offline learning is becoming one of the main teaching methods in major universities around the world.

To step up with e-learning process, the teachers need to develop their ability of teaching with technology. Although China has already carried out large-scale information-based teaching reforms and provided a large number of hardware facilities and training for teachers, there are still some problems. For example, some teachers are accustomed to traditional teaching methods and have a weak awareness of actively applying teaching with technology. Some teachers have no effective ways to access online resources or lack the ability to analyze and extract data resources, so they cannot use information technology to solve practical problems in teaching and improve teaching effectiveness.

In addition, many teachers lack sufficient participation in training and self-learning, resulting in a lack of initiative when facing new technologies, environments, equipment, and methods.

In 2005, Mishra and Koehler(2005) proposed the theoretical framework of TPACK (Technical Pedagogical and Content Knowledge), emphasizing the need for teachers to master a personal knowledge system of "technology internalization" under the demand of informatization, and achieve the integration of information technology (TK), teaching methods (PK), and subject content (CK). This provides a necessary theoretical basis for teachers to effectively apply technology in teaching.

Technical Pedagogical Content Knowledge (TPACK): Refers to how teachers use information and communication technology (ICT) to develop specific teaching strategies on different issues to promote learning knowledge. Therefore, it is a form of knowledge that transcends these three components (content, teaching methods, and technology). One of the fundamental components of the TPACK knowledge framework is TK, highlighting the importance of technical knowledge. The TPACK knowledge framework requires subject teachers to use teaching methods to package and disseminate subject knowledge with the support of technology. The TPACK knowledge framework emphasizes the application of information technology in teaching, and emphasizes the support and improvement of information technology in teaching. This theory can help teachers better understand the relationship between technology and teacher knowledge.

Currently, many studies in the TPACK field focus on the theoretical framework structure, measurement methods, and empirical research of TPACK. Based on these viewpoints, the author analyzed the research on TPACK published in China's largest journal databases CNKI and Scopus database, and conducted literature analysis about the papers. By analyzing and exploring the hot topics and future development directions in the field of TPACK research, this study aims to provide some suggestions for future research on teaching with technology, and also widen the theoretical basis for better implementation of e-learning.

LITERATURE REVIEW

When discussing the research and development trajectory of teachers' Technological Pedagogical Content Knowledge (TPACK), it can be further divided into the following stages:

Stage 1: Initial Stage (Mid-2000s)

The TPACK concept was initially introduced by Mishra and Koehler (2005), emphasizing that teachers need to integrate technology, pedagogical, and content knowledge effectively to teach courses. This stage primarily focused on concept clarification, exploring how teachers need to span multiple domains to successfully incorporate technology into classroom teaching. Scholar Li and Li (2008) first introduced TPACK framework into China and considered that this design learning model will combine learning technology, learning design with learning knots and improve teachers' ability of teaching with technology.

Stage 2: Concept Clarification and Development of Measurement Tools (Late-2000s)

After the introduction of the TPACK concept, researchers began clarifying the implications of its different components: technological knowledge, pedagogical knowledge, and content knowledge, and their interrelationships(Angeli & Valanides, 2009). With the concept being clarified, measurement tools gradually developed to assess teachers' TPACK levels, such as through questionnaire surveys or interviews. The measurement tool that was widely cited was the "Pre-service Teacher Teaching and Technical Knowledge Survey Scale" designed by Schmidt et al. (2009).

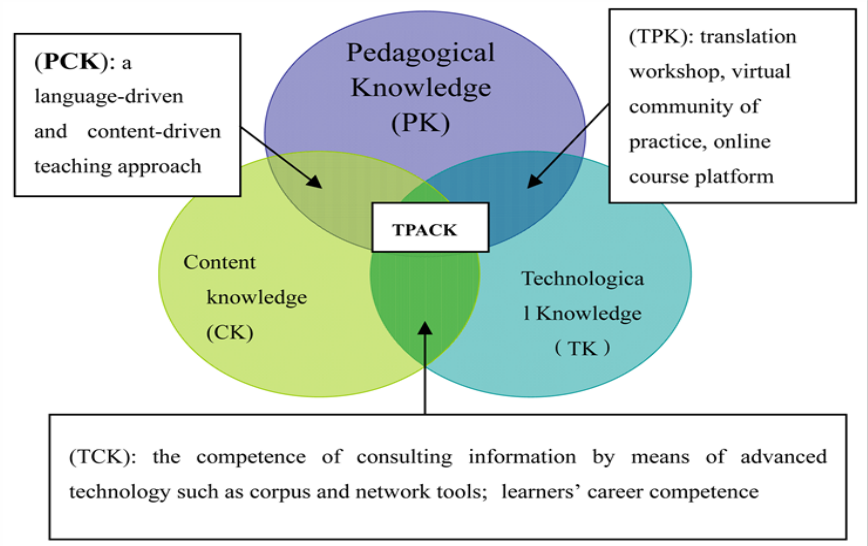

Figure 1: TPACK framework

Stage 3: Empirical Research and Case Studies (2010s)

During this stage, researchers started conducting empirical studies to explore how teachers' TPACK is applied in actual classrooms. Huang (2013) focused on how teachers integrate technology tools into teaching and the impact of such integration on student learning outcomes, engagement, and instructional effectiveness. Ertmer (2010) demonstrates four variables of teacher change and discusses the implications of them in pr-employment teacher education and in-service teacher TPACK development.

Stage 4: Professional Development and Education Policy (Late 2010s to Present)

With the proliferation of educational technology, more educational institutions and policies started paying attention to the development of teachers' TPACK. Saubern (2020) pointed that many teacher training and professional development courses began emphasizing the cultivation of teachers' TPACK abilities to adapt to the rapidly changing educational technology landscape.Ali (2020) stressed the necessity in making online courses for remote learning in higher education institutions to comply with the teachers' professional development.

Stage 5: Interdisciplinary Research and Expansion (2020s)

Recent research increasingly focuses on the development of teachers' TPACK in different subject areas, age groups, and cultural backgrounds (Tondeur et al., 2020). Additionally, researchers are starting to integrate TPACK with new technologies to delve deeper into teaching with technology. Celik (2023) insisted that having more knowledge about AI-based tools would enhance teachers' comprehension of the pedagogical benefits of AI.

In summary, the research and development trajectory of teachers' TPACK has evolved from the initial conceptualization to empirical research and professional development. This process not only contributes to a better understanding of teachers' teaching abilities with technology but also offers guidance to educational institutions to better support the integration of TPACK among teachers. However, systematic reviews on the research of TPACK development in China and foreign countries is still minimal. This research intends to make a review of the researches done on TPACK to find out the research trends and give some suggestions on future research direction.

METHOD AND SAMPLING

Literature selection

The author uses the advanced search function in CNKI database, takes "TPACK" as the main title, and limits the literature source category to SCI/EI/ Peking University Core /CSSCI/CSCD/AMI journals. A total of 306 papers were retrieved from 2013 to 2023. Using the retrieval function of Scopus database, the author conducted a search with the title "TPACK" and limited the publication year from 2013 to 2023, a total of 1095 English Journal papers were selected.

Research methods

This study used co-word analysis and word frequency analysis to analyze data extracted from CNKI and Scopus databases. The co-word analysis method is to analyze the phenomenon of keywords that can represent a certain research topic appearing simultaneously in the same literature, and then determine the relationship and research structure between the topics in the research field (Zhang et al., 2007). High-frequency keywords are a collection of keywords from all research literature in a certain field over a period of time, which can reflect the hot topics of the research field and help researchers determine its development frontiers and trends(Hou et al., 2009).

Research tools

This study mainly utilizes the built-in statistical analysis function of the database and the literature statistical analysis tool to conduct statistical analysis on the TPACK-related sample literature through a combination of charts.

FINDINGS

Statistical analysis of the numbers of "TPACK" relevant literature publications from CNKI and Scopus.

As is shown in Figure 2, the research trend on the topic "TPACK" in China and other countries is basically similar from 2013 to 2023, and it has shown an upward trend in recent years. Koehler and Mishra (2005) first specifically elaborated on the TPCK knowledge framework theory. Since then, the theoretical and practical research related to TPACK has become increasingly rich. In contrast, TPACK research in China started relatively late with scholars Li and Li (2008) first introduced it to China in 2008. It also showed a research peak in 2015 according to the figure. Although followed by a decline, the overall research still maintained an upward trend. Through data comparison, the author found that the number of TPACK research literature from 2019 to 2021 is relatively high both in China and other countries, this was mainly due to the impact of COVID-19. Most of the universities around the world have successively launched online teaching, so there was a high demand for research on information technology teaching and learning. The number of TPACK related studies has plummeted in 2022, which may indicate that TPACK research has temporarily entered a stage of adjustment and reflection.

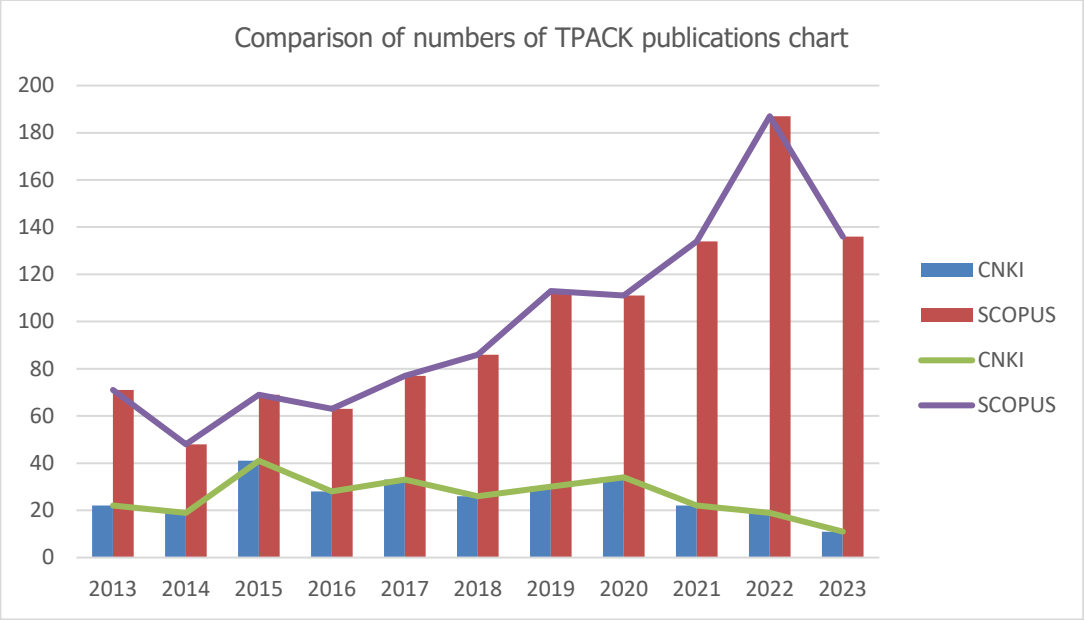

Figure 2: Comparison of numbers of TPACK publications from 2013 to 2023

Word frequency analysis

306 core journals retrieved from CNKI were used to extract field information using "keywords", and words with the same meaning were artificially synthesized, such as "TPACK", "TPCK", "Integrated Technology Teaching Methodology Knowledge", etc. The same operation was performed on the 1095 journal articles from the Scopus database. We have obtained a list of high-frequency keywords and frequencies for TPACK research from the two databases. Due to space limitations, only the top 18 are listed (as shown in Table 1). The higher the frequency of statistical results, the greater the correlation between the keyword and the topic, and the more research results based on this direction.

Table 1： List of high-frequency keywords in CNKI and Scopus TPACK literature

NO.	CNKI high-frequency words	frequency	Scopus high-frequency words	frequency
1	TPACK	187	TPACK	711
2	Normal students	20	Technology integration	131
3	Teacher's Informatization Teaching Ability	19	Pre-service teachers	125
4	Pre-service teachers	12	Teacher education	104
5	University teacher	10	Teacher professional development	91
6	Information technology	10	Technology	58
7	TPACK improvement model	9	Engineering Education	57
8	Empirical Study	8	ICT	49
9	Teacher professional development	8	educational technology	46
10	Subject knowledge	7	teachers	39
11	Math teachers	5	Higher education	39
12	influence factor	5	Mathematics education	35
13	Technology integration	5	Teacher training	34

14	Primary school teachers	4	Pedagogy	34
15	Vocational Teachers	4	E-learning	33
16	Cultivation Path	4	Content knowledge	32
17	TPACK development	4	Curricula	30
18	educational technology	4	Students	27

Co-word matrix

After extracting high-frequency keywords from TPACK-related literature obtained from CNKI and Scopus, the co-word matrix is generated. When two keywords appear in the same literature, it indicates that there is a relationship between them. The more often the two appear together, the greater the correlation between the group of words. The value on the diagonal in the matrix is the word frequency of the keyword. The local co-word matrices of the two groups of TPACK high-frequency words obtained are shown in Table 2 and Table 3.

Table 2: Common Word Matrix of CNKI TPACK High Frequency Keywords (Local)

	TPACK	Normal students	Pre-service teachers	Teacher's Informatization Teaching Ability	University teacher	Information technology	TPACK improvement model	Empirical Study
TPACK	187	14	9	3	7	4	0	5
Normal students	14	20	1	0	0	0	0	2
Pre-service teachers	9	0	12	0	0	2	0	0
Teacher's Informatization Teaching Ability	7	0	0	0	0	0	0	0
University teacher	6	0	0	1	10	0	0	0
Information technology	14	0	0	0	3	0	0	0
TPACK improvement model	11	0	0	0	0	0	0	0
Empirical Study	4	0	0	0	0	0	0	0

Table 3 : Common Word Matrix of Scopus TPACK High Frequency Keywords (Local)

	TPACK	Technology integration	Pre-service teachers	teacher education	Teacher professional development	Technology	Engineering Education	ICT
TPACK	711	24	15	14	23	13	5	7
Technology integration	24	131	9	7	5	3	5	4
Pre-service teachers	15	9	125	5	5	2	0	0
teacher education	14	7	5	104	8	2	2	2

Teacher professional development	23	5	5	8	91	5	1	1
Technology	13	3	2	2	5	58	2	3
Engineering Education	5	5	0	2	1	2	57	2
ICT	7	4	0	2	1	3	2	49

From word frequency analysis and co word matrix, it can be intuitively seen that some high-frequency words are closely related to other words and have been valued by many researchers. Therefore, co-word matrix and high-frequency words are currently a research hot spot in the field of TPACK. Some other keywords are at the edge of the co word matrix, but this does not mean that these words are irrelevant. Since most of the related research on these words has appeared in recent years, it can be explained that these keywords represent the forefront and trend of research in the field of TPACK. According to the high-frequency keyword table and co-word matrix, the author combined with the representative literature to comprehensively analyze the research hot spots and future research trends in the field of TPACK.

DISCUSSION

The latest research commonalities of TPACK in China and other countries

The top five high-frequency words in CNKI research are "TPACK", "normal students", "teacher information teaching ability", "pre-service teachers", and "university teachers"; The top five Scopus research keywords are "TPACK", "pre-service teachers", "Technology integration", "teacher education", and "teacher professional development". By comparing high-frequency keywords in China and other countries, it can be found that scholars have given a lot of attention to teachers' information technology teaching ability and the development of TPACK for pre-service teachers.

Research on Improving Teachers' Informatization Teaching Ability

Through specific literature review, it can be concluded that research focusing on teachers' information technology teaching ability mainly focuses on investigating the current situation of ability, quantifying information technology teaching ability, and empirical research on ability improvement strategies. Wang (2023) conducted a comprehensive survey and research on the current situation of information technology teaching ability of English teachers in Chinese universities. They pointed out that school policies, training conditions, teacher attitudes, and self-efficacy have a significant impact on the TPACK level of English teachers in universities, with self-efficacy having the greatest impact. Therefore, they proposed to strengthen professional training and skill empowerment teaching. Driss(2023) conducted a questionnaire survey on 82 prospective nursing educators in Morocco, and the results showed that participants had a higher level of self-awareness towards TPACK, scored higher in subject teaching knowledge and subject content knowledge, and scored lower in technology content knowledge. This study suggests conducting more teacher training to help nursing educators integrate technology, teaching methods, and content in teaching practice. Zhang(2017) and Zhang(2021) conducted research on the measurement of teachers' information based teaching ability and improved the scale and evaluation system. Sofwan(2023) developed tools for measuring TPACK and integrating technology in educational internships based on previous research, and proposed using Partial Least Squares Structural Equation Modeling (PLS-SEM) for data analysis, supplemented by Importance Performance Map Analysis (IPMA). Based on the TPACK theory and starting from the group of university teachers, Qi(2017) and Cong(2021) pointed out that improving teachers' information-based teaching ability requires the construction of training systems and courses. Luo

(2023) proposed a research-practice collaborative relationship approach to support the integration of CT and teacher information technology skills through case studies on the information technology teaching abilities of three American primary school teachers.

Research on TPACK Development for Pre-service Teachers

In recent years, research on the development of TPACK for pre-service teachers has focused on measuring the TPACK level of pre-service teachers, training methods and strategies, as well as empirical research. Eliana (2023) investigated the differences in self-reported subject teaching knowledge (TPACK) and technical beliefs of three groups of pre-service teachers through surveys. Sofwan (2023) studied the role of TPACK in pre-service teacher education internships and improved the TPACK level measurement scale accordingly. Nguyen(2022) found through their research on the design discourse of pre-service teachers that TPACK elements can collaborate with their technical enhancement courses. In China, Dai(2022) took Arizona State University in the United States as a reference, have optimized the training path of information technology teaching ability for pre-service teachers by promoting conceptual changes in the cultivation of information technology teaching ability for pre-service teachers and constructing a "curriculum group" for the cultivation of information technology teaching ability for pre-service teachers. Bai(2020) conducted a study on the correlation between PKM and TPACK levels of pre-service teachers based on a combination of quantitative and qualitative analysis, providing new ideas for the development of TPACK in pre-service teachers. Wang(2018) proposed an improvement path for the TPACK level of pre-service teachers through a questionnaire.

In addition, through a comparative study of the relevant literature content corresponding to high-frequency words in CNKI and Scopus database, it was found that the research section on pre-service teachers in China has conducted a separate study on the development of TPACK among normal student.

Differences in TPACK research both in China and other countries

By comparing high-frequency words in CNKI and Scopus research, the author found that CNKI research on TPACK in universities focuses on the investigation and development of university teachers, while Scopus research in this area focuses on higher education, while also focusing on both teachers' teaching and students' learning.

Wang(2022) improved the measurement scale based on the TPACK theoretical framework and the blended teaching competency model of university teachers, providing tool support for measuring the level of blended teaching competency of university teachers. Wei(2021) proposed a suggestion to form a TPACK system thinking to promote development mechanism based on the MOOC context. Xu(2018) and Song(2020) conducted surveys on the TPACK levels of university teachers nationwide and in western regions, and proposed development suggestions. Okan (2022) examines teacher experience and student perception by integrating technology into the teaching context of engineering colleges. Chansanam (2021) developed the Humanities and Social Sciences Online Student Platform (HUSO-OPS) using a user centric, TPACK, and V-model design. Aslam (2021) used a quantitative method of survey research design to explore the relationship between teacher technical education content knowledge (TPACK) and their technical proficiency. Marcelo (2019) and Ronny (2020) explored strategies for enhancing TPACK abilities of university teachers from the perspective of teacher preparation.

Future Trends in TPACK Research in China and other countries

Through the study of co-words and knowledge graphs, it has been found that future research on TPACK development will tend to focus on interdisciplinary and specialized research, applied practice research, and teacher TPACK ability improvement training research.

TPACK development in different disciplines

TPACK research should delve into specific disciplines. From the perspective of marginal keywords such as "mathematics teachers" and "English subjects", China has gradually realized the importance of subject specific TPACK research. However, currently there are only a few studies in China that have focused on the development of specific disciplines such as TPACK. And the scope and depth of existing research are still limited. Therefore, revealing the structural characteristics and development pathways of teacher TPACK from a disciplinary perspective will be a new trend in CNKI TPACK research.

Research on TPACK Ability Enhancement Training for Teachers

From the edge keywords "cultivation path" and "TPACK development", it can be seen that research on improving teacher TPACK ability training has attracted the attention of some CNKI scholars. At present, open learning situations such as flipped classrooms and MOOCs in China are in a popular development stage, and higher education teaching reform is urgent. These have put forward higher requirements for improving teachers' TPACK abilities. The development of information technology is also changing rapidly, so the improvement of teachers' TPACK ability depends on continuous self-learning and improvement training. Therefore, the research on teacher TPACK ability improvement training is an urgent problem to be solved in the current and future TPACK field.

IMPLICATION & CONCLUSION

As can be seen from the above, there are both similarities and differences in the research hot spots of TPACK in China and other countries. Most of the researches paid attention to the issue of improving teachers' TPACK abilities, and a focus has been placed on exploring the group of pre-service teachers. In terms of research trends, both CNKI and Scopus's TPACK research tends to focus on the development of teacher TPACK at specific educational levels and disciplines. However, compared to the already emerging TPACK research on pre-service teachers and mathematics education in Scopus, China is still relatively weak in terms of research breadth and depth. Thus TPACK research in China needs to be further deepened and expanded. Another noteworthy trend is the research on teacher TPACK ability improvement training. Based on the foundation laid by a large amount of quantitative research in the early stage, scholars have gradually shifted their research direction towards teacher ability improvement strategies and systematic training research in recent years. Based on the current research status in China and other countries, this study proposes the following suggestions for future TPACK research.

Firstly, TPACK research on specific application environments should be added, shifting from universal research to specialized research. Only by conducting TPACK localization research in a specific teaching environment or cultural background can it truly and effectively guide practice. Researchers need to change their thinking and pay more attention to specific situational factors such as subject, region, and stage, especially by delving deeper into specific disciplines to examine the structural characteristics and development mechanisms of TPACK among teachers in different disciplines. Shift from universal TPACK research to specialized TPACK research based on specific subject content, specific technical tools, or specific teacher groups.

Secondly, action and experimental research on TPACK teacher education courses should be carried out. At present, Chinese scholars have proposed several training models, development paths, and strategies for the development of TPACK, but few studies have been able to reflect on the problems and solutions of teacher information training courses in China from the perspective of designing teacher training. Therefore, China should keep up with the international forefront, make cultivating awareness and ability of technological design thinking the key to teacher curriculum, actively carry out action research and experimental research, and continuously optimize the design of teacher education curriculum. We should not only focus on whether teachers' skills meet the standards, but also pay attention to the changes in teachers' concepts, thinking, decision-making and

other processes, so that teachers become independent actors in technological learning and designers of technological innovation applications.

Finally, it is important to closely follow the digital process of education and conduct research on the framework development of I-TPACK and AI-TPACK. The TPACK framework research itself is already very mature and is constantly being improved through in-depth research. However, with the rapid changes in technology, the development of TPACK's framework is also a dynamic process. At present, with the development of information technology and the emergence of the metaverse, the reform of digital education is imperative. Therefore, conducting research on the framework development of I-TPACK and AI-TPACK is also an important direction for TPACK current development.

The literature data in this article is selected based on the theme as the search term, which has certain limitations and cannot cover all literature related to TPACK. This may lead to incomplete data analysis, which is the deficiency of this study. TPACK is hailed by the academic community as one of the most important developments in the field of information technology and curriculum integration in the past 25 years. As a research hot spot in the field of educational technology, it is a promising research field that deserves further in-depth research.

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The Effects of Blended Learning on Chinese Undergraduate EFL Students' Reading Achievement And Engagement

He Haiyan[1], Noraini Said[2]

[1]*Department of Foreign Languages, Yuncheng University, Shanxi, China; Faculty of Education, Language & Psychology, SEGi University, Malaysia*
hollyher328@163.com;
[2]*Faculty of Psychology and Education, Universiti Malaysia Sabah*
noraini.said@ums.edu.my
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Abstract

The present study aimed to examine the effects of blended learning on Chinese undergraduate EFL students' reading achievement and engagement. To achieve the objectives, a quasi-experimental research was carried out. It involved 82 junior EFL participants who were divided into a control group and an experimental group in a Chinese university. Only the experimental group was taught with blended learning in EFL reading activities, whereas the control group retained the conventional F2F EFL reading instruction. Both groups received the Reading Comprehension Test (RCT) and the Higher Education Student Engagement Scale (HESES) test during pre-and post-tests. After a twelve-week treatment in the experimental group, independent sample t-test and ANCOVA analyses were utilized to compare the pre-and post-test results of both groups. According to the findings of the study, blended learning showed a significant positive effect on Chinese undergraduate EFL students' reading achievement and overall student engagement in which students' academic engagement, cognitive engagement, social engagement with teachers, and social engagement with peers presented more effective results in blended learning than that in conventional learning, although students' affective engagement indicated no statistically meaningful difference. Therefore, blended learning as a popular learning normality in the digital era can be adopted in EFL reading classes to optimize EFL reading comprehension and activating student engagement in a sustainable manner.

Keywords: Blended learning, EFL reading achievement, student engagement

INTRODUCTION

Higher education is continuously seeking effective learning approaches to meet growing demands and expectations for better education quality. Blended learning has been an inevitably important trend and a learning normality at tertiary education in the digital era. English as a Foreign Language (EFL) reading, as an essential skill, plays a crucial role in EFL learners' academic success. Prior studies have already found an important link between blended learning and EFL reading among undergraduates. It still seems a time-consuming and struggle for most EFL learners in China, and studies on EFL reading have been experiencing a decline since 2012 in China, which is out of proportion to its crucial role in language skills (Cheng & Wu, 2023). Student engagement has become another growing emphasis and an important pedagogical indicator for measuring the success and quality of schools and class instructions and learnings recently. Blended learning has been identified as the potential

facilitation of student engagement, and it has achieved popularity on activating student engagement for EFL learners at tertiary education (Ren, 2023). However, there were little known about the effect of blended learning on undergraduate EFL student engagement in a Chinese setting. Therefore, a quasi-experimental study was conducted to investigate the effects of blended learning on Chinese undergraduate EFL learners' reading achievement and engagement, which is of great value for enhancing pedagogical richness, and providing instructional feedback for EFL reading activities in terms of student-centered learning.

In order to fulfil the research objectives, the present study purports to investigate the following questions:

RQ1: Is there a statistically significant effect of blended learning on Chinese undergraduate EFL students' reading achievement?

RQ2: Is there a statistically significant effect of blended learning on Chinese undergraduate EFL students' engagement?

LITERATURE REVIEW

Blended Learning

Blended learning has been a growing focus and somewhat of a buzzword in tertiary education, but it is still a contentious catchall term since its definition has undergone various evolution and development from a wide variety of ranges.

Blended learning (BL) was emergingly defined as a mixture of 30%-79% online courses and 1%-29% in-class F2F delivery of the content (Allen et al., 2007). Thereafter, BL is no longer limited to a certain proportion of online and offline courses in the field of online education, and it is widely used as a supplement to traditional face-to-face (F2F) classes in regular higher education. Bonk & Graham (2012) claimed that BL was an ongoing convergence of traditional F2F teaching systems and student-centered learning systems with computer-based technology. The definition of blended learning was not constricted by merely the mathematic adding of online and offline learning, it was a strategic learning approach that combined more than two learning methods from both F2F learning and online learning (Shin et al., 2018). Due to the wide spread of COVID pandemic, blend learning indeed reached the pinnacle at tertiary education. Fisher et al. (2021, p.98) interpreted blended learning as "an adaptive, dynamic, self-organizing, co-evolving complex system that seamlessly fuses face to face with technology mediated learning". In short, defining the term blended learning presented a dynamic evolution process.

It is not feasible to design one-size-fits-all blended learning since there are diverse learning objectives, contents, technologies, and materials. Generally, blended learning designs or models can be categorized into macro- and micro-levels: the macro level occurring at school and program levels, while the micro level refers to course and activity levels. Regarding the macro level, for instance, Valiathan (2002) provided three blended learning models in a broad view. The first was the skill-driven learning model, which aimed at developing students' specific knowledge and skills by creating a group-learning plan for teacher-facilitated self-paced mixed learning. Secondly, the attitude-driven learning model was used for developing specific behaviors blends traditional F2F classroom learning with online collaborative event-based activities. The third was the competency-driven learning model, which develop students' workplace competencies with a mix of online tools and live mentoring. Valiathan's blended learning models was viewed as a celebrated model guideline for designing specific formula in learning activities. In terms of the micro level, myriad designs have made in real learning settings. Nerantzi (2020) provided an active blended leaning model with peer instruction and flipped learning in higher education during the COVID pandemic. Peer instruction and flipped learning created integrated online and offline activities in the curriculum design. Before the real class, a self-paced online learning was offered for students. Live flipped and collaborative learning proceeded during the class. And lastly, student maintained their autonomous study after the class. These three stages were conducted in align with the course objectives, fully made use of digital network technologies and enabled active engagement in blended learning context. Feng et al. (2021) proposed a blended

activity design based on the community of inquiry in the "internet+" era. The blended activity strategy takes on various forms at the beginning, middle and end-of-term stage of the course, with the effective integration of teaching presence, social presence and affective presence.

Review of the Related Studies on EFL Reading Achievement

Reading comprehension was defined as an active and constructive process involving the interaction of text-based components like vocabulary and sentence, and reader-based components such as prior knowledge and perception of explicit and implicit meaning of the text (Wolf, 1993). EFL reading or reading comprehension, as a research area of multi-disciplinary perspectives, is a psycholinguistic process of obtaining text meaning (Chen & Chen, 2022). It had long been taken as one of the most core skills in EFL learning. Enhancing EFL reading comprehension was one of the most importance for EFL learners at tertiary education, and studies on EFL reading achievement had been an ongoing concentration. Previous studies had proceeded related researches on EFL reading achievement from a variety of perspectives such as reading strategies self-regulated learning, motivation, and teaching methods.

The ubiquity of digital technology in education had catalyzed related studies on how to facilitate EFL reading comprehension. Pitaloka et al. (2020) carried out a case study regarding the impact of blended learning on reading course for EFL undergraduates in South Sumatera, and found that blended learning benefited undergraduates in EFL reading class with flexible learning, understandable materials, and variations in learning approaches. It provided some advice for designing blended reading course such as time management for reading exercises, and convenient accessible platform. In order to find out whether blended learning could be positive toward EFL students' reading comprehension ability, Elahi & Heidar (2021) conducted an experimental study among Iranian EFL intermediated students at a private language institute, and explored that the integration of blended learning into task-based language teaching showed a significantly positive effect on Iranian EFL students' reading comprehension ability. Yudhana (2021) examined the impact of blended learning for the development of EFL reading skills of Thai undergraduates. The result of this quantitative experimental study showed that EFL students' reading skills were considerably improved in the blended learning context than those without. Rahimzadeh & Gilakjani (2022) used a quasi-experimental study to investigate the effect of blended learning on intermediate EFL students' reading proficiency in Iran. The results showed that students in blended learning context yielded a higher reading achievement than those in traditional training way.

Review of the Related Studies on Student Engagement

Researches concerning student engagement had been executed actively since 1980s. It had not attained consensus on the definition of student engagement. However, the most welcomed consensus of previous studies regarded student engagement as an active participation and investment in academic and co-curricular or school-related learning activities and university life, which were measured with multidimensional constructs ranging from two to many (Christenson et al., 2012). Measuring or assessing student engagement usually included self-reporting survey, direct observation, expert rating, interviews and experience sampling methods, in which quantitative self-reporting scale was the most used. Measuring student engagement mainly occurred at four levels: Institutional level, school level, course level and activity level (Skinner & Pitzer, 2012). Most previous studies focused on the indicator (or dimensions, and constructs) of the measurement or assessment of student engagement.

As the digital technology had been a crucial part impacting student engagement at tertiary education, an extensive research emphasis on measuring student engagement in blended learning context had been focused. Henrie et al. (2016) explored intensive longitudinal research on examining student engagement at course and activity levels in blended learning context by using self-report survey and behavioral data. Halverson (2016) found the overlap and intersection of students' behavioral engagement and cognitive engagement at activity level, based on which a conceptual framework of student engagement and the Blended Learning Course Engagement Survey (BLCE) measurement were presented with two constructs: cognitive engagement and affective engagement

in a blended learning environment. Ma & Zhou (2019) designed and developed the Blended Learning Environment Student Engagement Scale (BLSES) in China, and categorized student engagement into six dimensions in blended learning contexts, including active learning, teacher-student interaction, team collaboration, strategy implementation, self-management and affective engagement.

In the realm of EFL learning at tertiary education, Philp & Duchesne (2016) put student engagement on a narrow range of task engagement, and regarded student engagement as four-dimensional constructs involving behavioral engagement, cognitive engagement, social engagement, and affective engagement which mutually acted on each other. Hiver et al. (2021) posited there were at least three or four core dimensions for EFL student engagement, namely, behavioral engagement, cognitive engagement, affective engagement and social engagement. Guo et al. (2022) developed a comprehensive measurement of student engagement in EFL classroom in China, namely, the scale for foreign language classroom engagement (FLCE). The FLCE was constructed based on two learning contexts: individual-based or interaction-based modes, and three engagement constructs: behavioral engagement, cognitive engagement and affective engagement.

As seen in the previously-done studies, prior studies indicated an increasing concentration on the undergraduate EFL reading achievement in blended learning context, and measurement of student engagement either in blended learning context or EFL learning realm. However, few studies were made on blended learning in EFL reading activities, and empirical studies on undergraduate EFL students' reading achievement and engagement in blended learning context is still sparse and in its infancy in China.

METHODOLOGY

Research Design

To examine the effects of blended learning on EFL students' reading achievement and engagement, a quantitative quasi-experimental study was conducted in this present study (see Figure 1). Two groups were involved as the experimental group and the control group. The experimental group was treated with the blended learning of EFL reading activities or modules, whereas the control group received traditional EFL reading modules. Both groups received pre-tests and post-tests including the Reading Comprehension Test (RCT), and student engagement scores from the Higher Education Student Engagement Scale (HESES) before and after the treatment. Both groups were taught by the same EFL highly qualifies EFL teacher for a twelve-week duration.

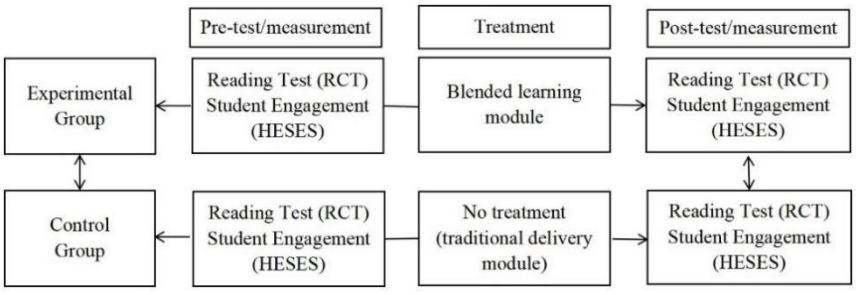

Figure 1: A Quasi-experimental Design

Research Participants

A G*Power 3 was used to determine the samples in this study. According to a compromised effect size of 0.6, an α error probability of 0.05, and a power (1 – β err prob) of 0.8, the minimal sample sized was 72 in total and 36 in each group. There were 42 students in each authentic class, which is more than the required numbers. A purposive sampling technique was used to select the experimental group and the control group. Two classes with a total of 82 third-grade (junior) EFL students, who majored in Business English in the academic year 2022-2023 at the Department of Foreign Languages in the study university located in the midwestern China, were selected in this quasi-experimental study.

Research Instrument

In this quasi-experimental study, two kinds of instruments were used to assess EFL students' reading achievement and student engagement to both groups in pre- and post-tests. The reading achievement was measured by the RCT---a widely-used standardized tests issued by Chinese Ministry of Education. Student engagement was also used for measuring EFL students' reading outcomes, which was measured by the Higher Education Student Engagement Scale (HESES) (Zhoc et al., 2019). It investigated undergraduate EFL students' engagement from five dimensions: academic engagement, cognitive engagement, social engagement with teachers, social engagement with peers, and affective engagement in the blended learning context. The HESES was a 5-point Likert scale questionnaire, and the scale score level ranged from 1 to 5 with 1 represents strongly disagree, 2 represents agree, 3 represents neither agree nor disagree, 4 represents disagree, and 5 represents strongly agree.

Reliability and Validity

To verify the validity and reliability of the instruments, a pilot study was conducted to the targeted participants at the study university.

First, a test-retest reliability strategy was used in the pilot study. Students took the RCT twice. It found that there were some items might cause confusion in the pre-test and post-test, which needed to be clarified in clear expression. For instance, students were confused with long paragraphs, therefore, numbers were marked before each paragraph to make it clear.

Second, to check items of the HESES, a pilot study test was conducted to 100 undergraduate EFL learners in the study university. The original HESES includes five dimensions of overall student engagement (STE): (1) Academic engagement (ACE); (2) Cognitive engagement (CGE); (3) Social engagement with teachers (SET); (4) Social engagement with peers (SEP); (5) Affective engagement (AFE). Through the factor analysis in SPSS 26, 22 items out of 28 preliminary items were retained (see Table 1).

Table 1: Factor Analysis of the HESES

	Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Academic engagement	1	0.79				
	5	0.83				
	6	0.76				
Cognitive engagement	10		0.82			
	11		0.80			
	12		0.86			
Social engagement with teachers	13			0.87		
	14			0.87		
	15			0.83		
	16			0.94		
Social engagement with peers	17				0.74	
	18				0.76	
	19				0.82	
	20				0.78	
	21				0.87	
	22				0.88	
	23				0.75	
	24				0.71	
Affective engagement	25					0.90
	26					0.87
	27					0.91
	28					0.71

The HESES was calculated to be reliable with the Cronbach alpha coefficient above 0.7. According to the criterion of Fornell & Lacker (1981), the validity was assessed by both composite reliability (CR) and average variance extracted (AVE) which generally required CR (>=0.7) and AVE (>=0.5). In this case, all latent variables showed good validity with CR (>0.7) and AVE (>0.5) (see Table 2).

Table 2: Reliability and Validity of Latent Variables

Factor	Cronbach's Alpha	CR	AVE
ACE	0.70	0.83	0.73
CGE	0.81	0.89	0.73
SET	0.90	0.90	0.60
SEP	0.91	0.88	0.71
AFE	0.87	0.95	0.64
STE	0.94	0.98	0.62

Data Analysis

The Statistical Package for the Social Sciences 26 (SPSS 26) was used to report all quantitative data. Independent sample t-test and ANCOVA analysis were calculated to compare the statistical difference between groups before and after the treatment.

FINDINGS

Pre-test Results

Before the experiment of blended learning in EFL reading activities, two pre-tests were administered to compare the difference of the control group (CG) and experimental group (EG) in the reading achievement and student engagement through independent-samples t-test.

In Table 3, the mean of the CG and EG was similar (CG=67.11 and EG=67.00), and the standard deviation or std. deviation (SD) of the CG and EG was 7.06 and 8.05, which indicated that two groups showed little difference toward the mean. The t value=0.12 (between +2 and -2) indicated that two groups are similar, and the p value (sig.) was apparently higher than 0.05 (p=0.90) which showed no statistically significance between two groups in EFL reading test before the treatment of blended learning in EFL reading activities.

Table 3: Pre-test Result of the RCT Scores

Group	Numbers	Mean	Std. Deviation	t-value	Sig.
Control group	42	67.11	7.06	0.12	0.90
Experimental group	42	67.00	8.05		

The pre-test result of the HESES scores was shown in Table 4. the mean of the CG and EG was similar (CG=3.35 and EG=3.38), and the SD of the CG and EG had similar data points around the mean (CG=0.29 and EG=0.30). Both the t-value (t=-0.49) and sig. value (p=0.62) indicated the null hypothesis was accepted, or indicated that the CG and EG had no statistically meaningful difference in EFL students' engagement before the treatment of blended learning in EFL reading activities.

Table 4: Pre-test Result of the HESES Scores

Group	Numbers	Mean	Std. Deviation	t-value	Sig.
Control group	42	3.35	0.29	-0.49	0.62
Experimental group	42	3.38	0.30		

Post-test Results

After twelve-week intervention with blended learning in EFL reading activities, two post-tests including the RCT and the HESES were conducted to both groups. In order to test whether blended learning caused the changes on post-test scores of undergraduate EFL students, the pre-test scores were regarded as the possible covariate to be controlled. ANCOVA analysis was used for explaining the post-test results of the RCT and HESES scores.

This quasi-experimental study was to check the cause-and-effect relationship through ANCOVA test, so assumptions of normality, the homogeneity of variance, and the homogeneity of regression slopes need to be fulfilled before the ANCOVA analysis. Firstly, the normality of the post-test scores as dependent variable (DV) need to be met. According to the data checked through Shapiro-Wilk test (See Table 5), post-test scores in both groups showed normal distribution with p value (Sig.) higher than 0.05 (p=0.12, p=0.29 indicated in the RCT and HESES of the CG, and p=0.67, p=0.06 indicated in the RCT and HESES of the EG).

Table 5: Tests of Normality in the RCT and the HESES

Post-test	Shapiro-Wilk Result of RCT		Shapiro-Wilk Result of HESES	
	Statistic	Sig.	Statistic	Sig.
Control Group	0.98	0.12	0.97	0.29
Experimental Group	0.98	0.67	0.94	0.06

Secondly, Table 6 indicated the results of Levene's test on the homogeneity of variance both in the RCT (F(1, 82)=0.06, p=0.81) and the HESES (F(1, 82)=3.32, p=0.07) had been met or non-significant so equal variance had been assumed with p value (Sig.) higher than 0.05.

Table 6: Tests of Homogeneity of Variance in the RCT and the HESES

Post-test	F	df1	df2	Sig.
RCT	1.71	1	82	0.20
HESES	3.32	1	82	0.07

Thirdly, according to the output of the homogeneity of regression slopes, the relationship between the pretests (covariate) and post-tests (DV) in the RCT and HESES is similar across the groups with F(2, 81)=2.30, p=0.11 in the RCT and F(2, 81)=3.11, p=0.06 in the HESES . Hence the assumption of homogeneity of regression slopes was not violated (See Table 7).

Table 7: Tests of Homogeneity of regression slopes in the RCT and the HESES

Source	Sum of Squares		df		Mean Square		F		Sig.	
	RCT	HESES	RCT	HESES	RCT	HESES	RCT	HESES	RCT	HESES
Corrected Model	.65[a]	398.08[a]	2	2	0.32	199.04	2.30	3.11	0.11	0.05
Intercept	26.78	3722.70	1	1	26.78	3722.70	191.02	58.13	0.00	0.00
Group * PreTotal	0.65	398.08	2	2	0.32	199.04	2.30	3.11	0.11	0.06
Error	11.36	5187.16	81	81	0.14	64.04				
Total	1302.39	427894.00	84	84						

Then ANCOVA analysis was conducted to compare whether blended learning may positively impact Chinese undergraduate EFL students' reading achievement through the RCT and student engagement through the HESES. Results from the ANCOVA analysis explained the post-test results of the RCT and HESES scores with controlling the pre-test scores. Table 8 was the result of between-subjects effects and indicated that there was a statistically significant difference between the CG and

the EG in EFL reading achievement, F(1, 81)=8.14, p=0.01, Partial Eta Squared (Partial η2)=0.09, and the overall student engagement (STE), F(1, 81)=38.24, p=0.00, Partial η2=0.32.

Table 8: ANCOVA Results of the RCT and the overall STE

Source	Sum of Squares		df		Mean Square		F		Sig.		Partial Eta Squared	
	RCT	STE	RCT	STE	RCT	STE	RCT	STE	RCT	STE	RCT	STE
Corrected Model	1709.57[a]	2.06[a]	2	2	854.78	1.03	20.55	19.12	0.00	0.00	0.34	0.32
Intercept	1212.88	10.52	1	1	1212.88	10.52	29.16	195	0.00	0.00	0.27	0.71
Pretest	1389.38	0.01	1	1	1389.38	0.01	33.41	0.174	0.00	0.68	0.29	0.00
Explained	338.43	2.06	1	1	338.43	2.06	8.14	38.24	0.01	0.00	0.09	0.32
Error	3368.75	4.37	81	81	41.59	0.05						
Total	424697.00	1363.66	84	84								

On the one hand, the post-test result of the RCT scores in Table 9 showed that blended learning could positively improve Chinese undergraduate EFL students' reading achievement in the EG (N=42, M=72.63, SD=7.92) rather than in the CG (N=42, M=72.63, SD=7.92). In other words, the undergraduate EFL students' reading achievement in the experimental group was better than that in the control group.

Table 9: The Post Result of the RCT Scores

Group	Numbers of students	Mean	Std. Deviation	Sig. (2-tailed)	95% Confidence Interval of the Difference	
					Lower	Upper
Control group	42	68.73	7.30	0.02	-7.21	-0.60
Experimental group	42	72.63	7.92			

On the other hand, the overall student engagement of undergraduate EFL learners in the experimental group was improved through the treatment of blended learning (See Table 10). The CG and the EG showed no difference (p=0.62) with N=42, M=3.35, SD=0.29 in the CG and N=42, M=3.38, SD=0.30 in the EG before the treatment of blended learning. However, the EG presented a significant difference and better improvement than the control group (p=0.00) with N=42, M=3.86, SD=0.18 in the CG, and N=42, M=4.18, SD=0.27 in the EG.

Table 10: The Pre-test and Post-test of the HESES Scores

Group	Numbers of students	Mean		Std. Deviation		Sig. (2-tailed)	
		Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
Control group	42.00	3.35	3.86	0.29	0.18	0.62	0.00
Experimental group	42.00	3.38	4.18	0.30	0.27		

In addition, although the overall student engagement was significantly improved in the EG after the experiment as above mentioned, however, Table 11 indicated a brief result of between-result effects on the five respective constructs of student engagement. It showed a statistically increase of Chinese undergraduate EFL Students' engagement in the following constructs after the treatment of blended learning (p<0.05): Student academic engagement (ACE) was F(1, 81)=15.88, p=0.00, Partial η2=0.16, cognitive engagement (CGE) was F(1, 81)=67.73, p=0.00, Partial η2=0.46,

social engagement with teachers (SET) was F(1, 81)=8.69, p=0.00, Partial η2=0.10, and social engagement with peers (SEP) was F(1, 81)=24.25, p=0.00, Partial η2=0.23 including two sub-constructs of peer engagement (SEP-PE) (F(1, 81)=17.37, p=0.00, Partial η2=0.18) and beyond-class engagement (SEP-BE) (F(1, 81)=15.63, p=0.00, Partial η2=0.16) were all statistically increased after the treatment of blended learning (p<0.05). However, student affective engagement (AFE) showed no significant difference between the experiment group and the control group (F(1, 81)=3.60, p=0.06, Partial η2=0.04).

Table 11 : ANCOVA Analysis of the Constructs in the HESES

Construct	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
ACE	4.97	1.00	4.97	15.88	0.00	0.16
CGE	7.70	1.00	7.70	67.73	0.00	0.46
SET	1.34	1.00	1.34	8.69	0.00	0.10
SEP	1.60	1.00	1.60	24.25	0.00	0.23
SEP-PE	1.71	1.00	1.71	17.37	0.00	0.18
SEP-BE	1.41	1.00	1.41	15.63	0.00	0.16
AFE	0.30	1.00	0.30	3.60	0.06	0.04

(The error of df is 81 for all construct items, so F (1, 81) was described in the passage above.)

DISCUSSION

In order to examine effects of blended learning on undergraduate EFL students' reading achievement and engagement, a quasi-experimental study was administered to two groups involving the experimental group (42 students) and the control group (42 students) in a Chinese university. After 12-week duration of blended learning to the experimental group, the findings of two post-tests were shown as follows.

Firstly, blended learning had a significant effect on undergraduate EFL students' reading achievement (p<0.05). In other words, using blended learning in EFL reading activities was more effective than using traditional learning. The findings obtained in this study revealed the potential strength of using blended learning for improving EFL students' reading comprehension successfully. It was in accordance with conclusions from some similar prior researches. Ghazizadeh & Fatemipour (2017) examined the positive effectiveness of implementing blended learning on EFL learners' reading proficiency in Iran.

Secondly, utilizing blended learning could significantly increase undergraduate EFL students' overall engagement in which four out of five engagements were increased respectively in terms of academic engagement, cognitive engagement, social engagement with teachers, and social engagement with peers, yet except affective engagement. It is aligned with some previous studies as Bedenlier et al. (2020) found that affective engagement was the lowest observed construct, however, educational technology was an inevitable support for improving student engagement nowadays.

CONCLUSION

The present study investigates the effects of blended learning on undergraduate EFL students' reading achievement and engagement in a Chinese setting. It is empirically confirmed that utilizing blended learning can significantly increase students' EFL reading comprehension and overall student engagement. In brief, it suggests that blended learning should be promoted widely for EFL students' reading comprehension, and active student engagement in EFL reading activities. However, some limitations should be considered because of the short duration and restricted numbers of participants in this quasi-experimental study. A longitudinal study could be conducted to investigate Chinese EFL students' reading comprehension and engagement, and a qualitative study such as focus group discussion can obtain in-depth perception toward EFL students' experiences in blended learning

context for future study. This would allow researchers to examine the sustainability of blended learning and shed light on factors contributing to EFL reading achievement and student engagement.

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Vocational College Students' Learning Efficiency on The Use of Computer English MOOC in Hybrid Learning

[1]Wei Wei, [2]Noraini Said

[1]Faculty of Psychology and Education, SEGi University
[1]Faculty of Computer Appliance, Shijiazhuang Information Engineering Vocational College
angelamattalex@163.com
[2]Faculty of Psychology and Education, Universiti Malaysia Sabah*
noraini.said@ums.edu.my
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ABSTRACT

With the improvement of educational technology modernization, the promoting effect of network technology on education has been widely concerned by educational circles Massive Open Online Courses (MOOCs) have emerged as a popular platform for learners to access and utilize educational resources. This paper aims to investigate the relationship between various aspects of hybrid learning in the Computer English MOOC platform, including students' learning objectives, methods, concentration, collaborative skills, teacher supervision, and learning efficiency. The research utilizes a quantitative approach to analyze data obtained from 168 vocational college students majoring in computer-related subjects. During the Covid-19 pandemic, it was not always possible for students to go to school in person, but when it came to learning Computer English, they had clear goals. Students were able to get complete and organized information through hybrid learning. And there is a strong relationship between learning cooperation and learning proficiency via hybrid learning. Learning cooperation has the most significant influence on learning proficiency. This study lies in its potential to bridge the knowledge gap regarding the specific factors that impact English language acquisition in the vocational college setting. This research seeks to provide valuable insights and recommendations to inform pedagogical practices, curriculum development, and institutional policies in higher vocational colleges in China.

Keywords: Educational technology, MOOC (Massive Open Online Course), hybrid learning, learning efficiency

INTRODUCTION

Research background

With the improvement of educational technology modernization, the promoting effect of network technology on education has been widely concerned by educational circles(Khoshsima & Shokri, 2016). Digital informatization has appeared in people's vision. "Using technology to support learning" has gradually become the mainstream of the combination of technology and teaching at home and abroad(Chowdhury, 2020). At the same time, education technology is undergoing an open reform.

Several online platforms are used to implement e-learning in higher education. Online learning has been referred to by a variety of names over the years, such as computer-associated learning, web-based training, e-learning systems, and learning management systems(Bahsh & Daoud, 2016). MOOCs（Massive Open Online Courses）are a good option to help learners enhance English language listening, speaking, reading, writing, and translating skills. The courses gathered by the Internet

Educational Institutions are a special way to participate in real classes which are taught by real professors, but learners do not have to go to the university in person.

MOOC is a part of hybrid learning. Hybrid learning has become a very important research area in the field of educational technology in the world because it can integrate classroom teaching and online learning(Joksimović et al., 2018)(Zhu et al., 2020). Students have the opportunity to learn whenever and wherever they want thanks to online-based mobile learning(Akhras, 2012). Especially for language learners, language learning is about learning anytime and anywhere, teachers could provide more learning materials on the MOOC platform for senior vocational college students. This is anticipated to make a number of contributions to understanding the factors that influence students' learning proficiency to use MOOCs even after switching back to the face-to-face learning method.

Problem statement

For students of computer-related majors, English includes College English and Computer English. The learning purpose of Computer English is to teach students to master the frequently used professional vocabulary and expression methods in their professional field, and then master some methods of fast and accurate reading and understanding professional literature, improve their international communication ability, and understand the latest cutting-edge trends in this research field, so as to lay a solid professional foundation for future work or further study. Therefore, Computer English is a compulsory course for computer-related majors, which is worth investigating the learning efficiency to promote students to complete the transition from English learning to practical application.

Nowadays, college students can now learn College English and ESP with computers and mobile devices, especially MOOCs with language learning software, online chatting tools, multimedia glossaries, and games, which provide opportunities for students to learn anytime and anywhere. Teachers can provide more learning materials on this platform. However, are these new educational technologies suitable for hybrid learning? What are the factors affecting ESP English Teaching and learning while they are using MOOCs to study Computer English? There is a lack of deep understanding of this new educational technology for teachers and students, and both of them need a long time to adapt.

Research gap

In recent years, not only the research on the MOOC platform is a research hotspot, but also the research related to technology acceptance of learning proficiency. The research perspectives of most researchers are to build a new teaching model, and there is less research on the factors of acceptance and adoption on new technologies. Although MOOC is developing very fast at present, in actual use, researchers pay more attention to the presentation and transmission of learning content (Bralić & Divjak, 2018). Most researchers focus on how to make and use MOOCs, making teaching more convenient and easier(Zhang et al., 2021). However, it is rarely mentioned in the research whether the learners' learning efficiency of MOOC and whether the learners evaluate MOOC during hybrid learning.

Research Objectives

This paper aims to investigate the relationship between various aspects of hybrid learning in the Computer English MOOC platform, including students' learning objectives, methods, concentration, collaborative skills, teaching supervision, and learning efficiency.

RO: To investigate the relationship among students' English language learning objectives, learning methods, concentration, collaborative skills, teacher supervision, and learning efficiency via Computer English MOOCs in hybrid learning.

Research Questions

RQ1: Is there a significant relationship between students' learning objectives and learning efficiency for learning English using Computer English MOOC in hybrid learning?

RQ2: Is there a significant relationship between students' learning methods and learning

efficiency for learning English using Computer English MOOC in hybrid learning?

RQ3: Is there a significant relationship between students' learning concentration and learning efficiency for learning English using Computer English MOOC in hybrid learning??

RQ4: Is there a significant relationship between students' collaborative skills and learning efficiency for learning English using Computer English MOOC in hybrid learning?

RQ5: Is there a significant relationship between teacher supervision and learning efficiency for learning English using Computer English MOOC in hybrid learning?

Research Hypothesis

H1: There is a significant relationship between students' learning objectives and learning efficiency for learning English using Computer English MOOC in hybrid learning.

H2: There is a significant relationship between students' learning methods and learning efficiency for learning English using Computer English MOOC in hybrid learning.

H3: There is a significant relationship between students' learning concentration and learning efficiency for learning English using Computer English MOOC in hybrid learning.

H4: There is a significant relationship between students' collaborative skills and learning efficiency for learning English using Computer English MOOC in hybrid learning.

H5: There is a significant relationship between teacher supervision and learning efficiency for learning English using Computer English MOOC in hybrid learning.

Significance of this Study

The results of the study will be beneficial to Chinese vocational college students, higher education English instructors, China's higher educational institutions, educational technology designers, and China as a whole. Technology incorporation for English teaching and learning has been one of the trends to encourage the restructuring of College English Education in China. It is important to identify factors that consider the use and efficacy of technology in Chinese college students' learning of English. By delving into the realm of hybrid learning within the Computer English Massive Open Online Course (MOOC) platform, this investigation will comprehensively explore various dimensions, encompassing students' learning objectives, methodologies, levels of focus, collaborative skills, teachers' competencies, and overall learning efficiency.

LITERATURE REVIEW

Hybrid Learning

Hybrid learning mixes in-person and online instruction into a single seamless experience. Students participate in online learning for the other half of the class sessions, which are split roughly in half. Although it may seem like a simple formula, careful planning is required to make sure that the hybrid functions properly and enables its two formats to benefit from one other's advantages. Educational reformers generally believe that hybrid learning has three main components. Combining both in-person and online learning, combining technologies, and combining techniques are the three descriptions or definitions of hybrid learning(Creative Commmons Attribution 4.0 Technologies, n.d.).

Hybrid learning in a single semester may emphasize classroom time in the beginning, and then gradually increase students' workload in e-learning or autonomous learning. For example, many people believe that if participants communicate face-to-face first, the classroom discussion board will be more efficient. In this study, in order to make efficient, resourceful, clear, understandable, and attractive teaching materials, researchers preplanned the course design carefully, make the prerecorded videos, and uploaded them to *Zhi Hui Zhi Jiao* Learning Platform. Students can watch the videos before coming to the classroom, think before coming to the classroom, and see whether they got questions to ask for teachers' help. In that case, teachers are not only to teach but also guide and problem solvers.

MOOC in Hybrid Learning

Online learning is becoming a crucial component of education, giving both students and teachers access to more adaptable, affordable, and convenient methods of instruction. Since it can reach more students with greater convenience and at a lower cost, online learning has become a staple of most levels of education, despite the fact that it has been appeared around human beings since the 1990s.

The first massive open online course (MOOC) of its sort was introduced in September 2008 (University of Manitoba, 2008). For an online course provided by the University of Manitoba, Dave Cormier of the University of Prince Edward Island, Canada, created the acronym MOOC. The public could access video lectures, texts, and online discussion forums for free as part of the Connectivism and Connective Knowledge course created by Manitoba professors George Siemens and Stephen Downes. However, MOOCs did not really catch the attention of academics and educators throughout the world until 2011, when the Massachusetts Institute of Technology, Boston (MIT), released the largest collection of free open courseware in the world. It was essentially a tiny credit-bearing course for 24 students, with about 2200 registered participants on an open-access network, of which about 150 were actively engaged at different periods(Mackness et al., 2010).

MOOCs are a continuous and further development in distance education. Massive Open Online Courses (MOOCs) are free online courses that are available and affordable for anyone to learn. MOOCs provide an accessible and flexible path to get new skills, increasing learners' knowledge and work career, and transforming quality educational experiences in the target fields. Hundreds of people around the world use MOOCs to learn for all kinds of reasons, including job expectations, changing careers, degree preparations, complimentary learning, corporate e-Learning & training, lifelong learning, and more(Bralić & Divjak, 2018).

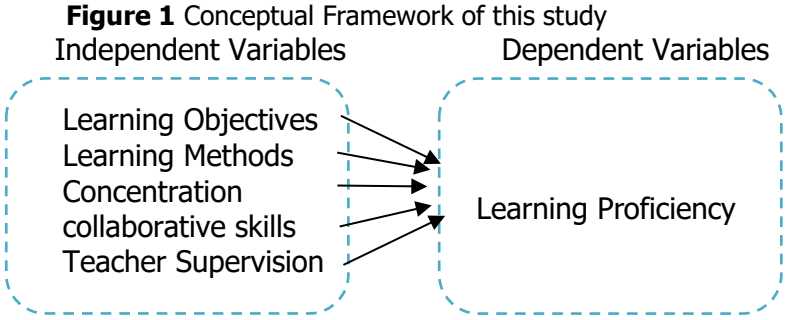
Asynchronous and Synchronous online English courses

Online courses can be divided into two categories: synchronous and asynchronous. Synchronous learning takes place in the present and can be done online or face-to-face (f2f). On a predetermined class schedule, both instructors and students log in simultaneously. In a synchronous setting, instructors may take attendance (whether virtually or in person), and there is live contact between students and teachers. Learning can take place in the same physical setting, such as a lecture hall, or online. The usage of web conferences, teleconferences, live chat, and lectures that must be watched in real-time while being streamed online by instructors is permitted.

MOOC is a kind of asynchronous course. An asynchronous course is that it is available to learners at any time. Students do not need to get lessons at a fixed time or date. The English learning materials can be provided at one time or on-site. Learners can look for the content when they have free time and complete any optional assignments. Learners may not care about who is providing the material. These courses are often pre-recorded by a group of people, videos are recorded in advance. Professors prepared lecture notes for their lessons. While learners have enrolled in the course to study on their own time, they personally need to remember the deadlines for some assignments. That is why it is important to be organized when taking asynchronous courses.

Conceptual Framework

Figure 1 Conceptual Framework of this study



The goal of this article is to examine the connections between several components of hybrid learning in the Computer English MOOC platform, such as students' learning objectives, methods, concentration, collaborative skills, teacher supervision, and learning efficiency.

METHODS AND SAMPLING

Research Design

To answer the research questions, test the study's hypotheses, and give a plan for the gathering and analysis of descriptive data, quantitative procedures are the most effective. Quantitative research findings are also valid, accurate, and trustworthy for extrapolating to a wide population. An online questionnaire was used as the method of choice for quantitative study. Correlational analyze investigate whether there is a link between the independent and dependent variables, including Person's Correlational analyze, linear regression.

Population and Sample

The population for this study is vocational college students at a vocational college, aged between 19 to 23 years old. The MOOC learning community is the study's target population. 168 vocational college students majoring in computer-related subjects answered the questionnaire.

Instrument

An online survey that was given to a sample of Vocational College students served as the primary method of data gathering for this study. The open-access questionnaire used in this study was developed from one that can be found at https://www.wjx.cn/report/2154194.aspx.. Six fundamental constructs which are learning objectives, learning methods, concentration, collaborative learning, teacher supervision, and learning proficiency were covered by the survey instrument. The survey consisted of 42 questions in total to gauge these constructs. Each item was rated on a 5-point Likert scale, with 1 represent "strongly disagree" and 5 denoting "strongly agree." This scale was chosen because it is a reliable method of documenting user responses, is simple to use, and enhances the precision of data analysis.

Factor Analysis

A strategy for condensing a large amount of data into a more manageable and intelligible data set is factor analysis. It is a method for locating elusive patterns, highlighting their overlaps, and highlighting the traits that numerous patterns have in common. Additionally, it is used to create a dimension, or set of variables, for the related objects in the set. Table 1 showed the out loading of factor analysis of this study.

Table 1 Out loading of Factor analysis

	Objective	Collaboration	Concentration	Method	Observation
LO1	0.937				
LO2	0.888				
LO3	0.729				
M1				0.852	
M2				0.728	
M3				0.961	
M4				0.870	
M5				0.916	
M6				0.905	
M7				0.963	
M8				0.917	
M9				0.889	

LC1		0.940	
LC2		0.876	
LC3		0.880	
LC4		0.735	
LC5		0.807	
LC6		0.921	
LC7		0.820	
LC8		0.884	
C1	0.932		
C2	0.922		
C3	0.878		
C4	0.855		
C5	0.898		
TO1			0.919
TO2			0.937
TO3			0.869
TO4			0.769
TO5			0.895
TO6			0.878

The validity and reliability

It is crucial to confirm the reliability and validity of the data from various sources prior to analysis. Finding out how stable the study's questionnaire is was the goal of reliability analysis. A higher coefficient value means the thing is more stable and closer to 1, while a lower coefficient value means the thing is less stable and closer to 0. The reliability analysis looks at how consistent the measurement scale is. In this piece, Cronbach's alpha values, which are written as, are used to measure reliability. Table 3.2 shows that the general reliability of the scale, as measured by SPSS (V25), ranges from satisfactory to good, which is a good sign for scale reliability. The reliability of learning objective is .665, which has 3 items and that is acceptable. The reliabilities of learning methods, concentration, collaborative skills, teaching observation are all above 0.8 , which shows the reliability of this test or scale is very good.

Table 2 Reliability Statistics

Construct	Cronbach's Alpha	Cronbach's Alpha Based on Standardized items	N of items
Learning objectives	.665	.668	3
Learning methods	.927	.927	9
Concentration	.940	.940	8
Collaborative skills	.916	.916	5
Teaching observation	.939	.939	6

Validity analysis is a critical evaluation of how accurate and useful the research tool is. It does this by looking at how well the data collected matches the real event being studied. Table 3 shows the KMO value of this study. If this value is higher than 0.8, it indicates high validity; If this value is between 0.6 and 0.7, it indicates acceptable validity.

Table 3 KMO and Bartlett test

Construct	Kaiser-Meyer-Olkin Measure of Sampling-Adequacy	Bartlett's Test of Sphericity		
		Approx. Chi-Square	df	Sig
Learning objectives	.636	78.956	3	.000
Learning methods	.910	1021.641	36	.000
Concentration	.917	1049.614	28	.000
collaborative skills	.869	589.577	10	.000
Teacher supervision	.897	889.666	15	.000

DATA ANALYSIS

This section presents the analysis and findings derived from the quantitative data collected through the administered questionnaire. The analysis of the quantitative data was conducted using SPSS (Version 25). The data gathered from the online questionnaire were analyzed by calculating the frequency of students' common responses and presenting them in the form of percentages. Furthermore, the participants' responds from question 1 to question 42 were collected using the 5 Likert scale and is reported in the descriptive statistics, providing insights into the learning behavior of students when utilizing the Computer English MOOC.

Demographics

In order to determine the frequency and percentages of the demographic information provided by the participants, descriptive statistics were used. Demographic information was classed as categorical data (e.g., numerical such as grade, gender, and major). Table 4 shows 62.5% computer-related major students were male students. Grade 2 students were the main sample of the study, 83.9%(n=168) students were grade 2 students. 94% students' major were related to science.

Table 4 Frequency distribution of personal information

			Frequency	Percent	Valid Percent	Cumulative Percent
Gender	Valid	Male	105	62.5	62.5	62.5
		Female	63	37.5	37.5	100.0
		Total	168	100.0	100.0	
Grade	Valid	Grade2	141	83.9	83.9	83.9
		Grade3	27	16.1	16.1	100.0
		Total	168	100.0	100.0	
Major	Valid	Humanities	10	6.0	6.0	6.0
		Science	158	94	94	100.0
		Total	168	100.0	100.0	

Data cleaning

Data cleaning is the procedure of editing, fixing, and organizing data inside a data set to make it more uniform and ready for analysis is known as. For the best analysis, this entails eliminating incorrect or unnecessary data and formatting it in a manner that computers can understand. A common adage in data analysis is "Garbage in, garbage out," which suggests that if people start with faulty data (trash), they will only receive "garbage" outcomes. In this study, there are 168 participants in the sample, there are no missing data in the dataset, but there are outliers in the dataset. Therefore, data cleaning process is important for further data analyze.

Simple correlation between the dependent and independent variables

The Pearson correlation coefficient (r), also known as Pearson's r , Bivariate correlation, Pearson product-moment correlation coefficient (PPMCC), and the correlation coefficient, is the most commonly used correlation coefficient. A descriptive statistic, such as the Pearson correlation

coefficient, summarizes the features of a dataset. The degree and direction of the linear relationship between two quantitative variables are specifically described. Table 5 below provides general guidelines, while the meanings of link strength—also known as impact size—vary between disciplines. If the Pearson correlation coefficient value is greater than 0.5, it indicates that there is strong and positive relationship between two quantitative variables. Table 6 and Figure 2 shows the results of correlation indicate that all the independent variables have a positive strong relationship with the student's learning proficiency of learning Computer English MOOC via hybrid learning. Learning objective(r=.513), learning method(r=.685), learning concentration(r=.804), learning cooperation(r=.849), and teacher's supervision(r=.759) showed a positive strong relationship with student's learning proficiency.

Table 5 Pearson correlation coefficient criteria

Pearson correlation coefficient (r) value	Strength	Direction
Greater than .5	Strong	Positive
Between .3 and .5	Moderate	Positive
Between 0 and .3	Weak	Positive
0	None	None
Between 0 and -.3	Weak	Negative
Between -.3 and -.5	Moderate	Negative
Less than -.5	Strong	Negative

Table 6 Pearson correlation coefficient

	Learning objectives	Learning methods	Concentration	Collaborate Learning	Teacher supervision	Learning proficiency
Learning objectives	1					
Learning methods	.584**	1				
Concentration	.512**	.802**	1			
collaborative skills	.413**	.617**	.746**	1		
Teacher Supervision	.492**	.715**	.766**	.722**	1	
Learning proficiency	.513**	.685**	.804**	.849**	.759**	1

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

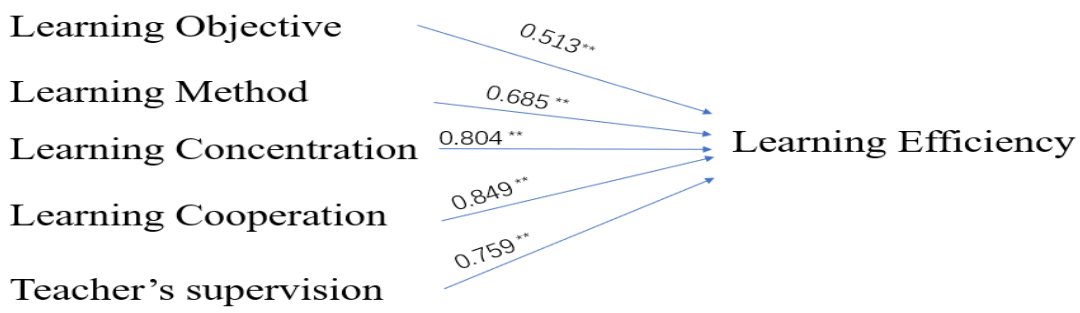


Figure 2 Pearson correlation coefficient

Linear Regression analysis

A statistical technique that demonstrates the link between two or more variables is regression analysis. The approach examines the relationship between a dependent variable and independent variables, typically represented in a graph. Regression analysis seeks to determine which variables account for the greatest change in the independent variable(s) when the dependent variable(s) changes. Table 7 shows the fit of this regression is good, R^2=0.803(>0.6). R^2 indicates the size of the

model's fitting ability, 0.803 indicates that the independent variables has 80.3% explanatory power for the dependent variable. This value is between 0 and 1, the larger the better. Table 8 shows the P value. If P<0.01, the difference is extremely significant. Table 9 shows which constructs are significant influence learning proficiency and each predictors' coefficients of this study.

Table 7 Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					
					R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.896[a]	0.803	0.797	0.30654	0.803	131.931	5	162	0.000	1.775

a. Predictors: (Constant), Teacher's supervision, Learning Objective, Learning Cooperation, Learning Method, Learning Concentration

b. Dependent Variable: Learning Efficiency

Table 8 ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	61.984	5	12.397	131.931	.000[b]
	Residual	15.222	162	0.094		
	Total	77.206	167			

a. Dependent Variable: Learning Efficiency

b. Predictors: (Constant), Teacher's supervision, Learning Objective, collaborative skills, Learning Method, Learning Concentration

Table 9 Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	-0.158	0.167		-0.945	0.346		
	Learning Objective	0.123	0.055	0.097	2.243	0.026	0.647	1.546
	Learning Method	-0.002	0.072	-0.001	-0.023	0.982	0.300	3.334
	Learning Concentration	0.265	0.070	0.271	3.786	0.000	0.238	4.206
	collaborative skills	0.519	0.057	0.510	9.092	0.000	0.388	2.580
	Teacher's supervision	0.139	0.061	0.136	2.258	0.025	0.334	2.995

a. Dependent Variable: Learning Efficiency

RESULTS & DISCUSSION

A thorough study of the reported questionnaire variables was done to figure out how people used the Computer English MOOC to learn. This was done to get a better idea of how people learned when they used the course. From the table 7, table 8, table 9, the following results can be shown. The fit of this regression is good, R^2=0.803(>0.6), this means that the results of this statistics can accurately and reliably reflect the impact of the independent variable on the dependent variable. The five independent variables do not have multicollinearity, VIF<5. Regression equation is significant, P=.000, P<0.001, means that at least one of the five independent variables can significantly affect the dependent variable. Learning concentration(β=0.265>0, P<0.05), learning cooperation(β=0.519>0,P<0.05), Teacher's supervision (β=0.139>0,P<0.05), Learning objective

(β=0.123>0,P<0.05) can positively significantly impact learning proficiency. Learning method (β=-0.002<0, P>0.05) cannot negatively significantly impact learning proficiency. Finally, the following regression equation is derived between the variables. Learning proficiency=-0.158+0.265*learning concentration+0.519* collaborative skills +0.139* teacher's supervision+0.123* learning objective. Table 10 shows the overall results of each research question. There is a significant relationship between students' learning objectives and learning efficiency for learning English using Computer English MOOC in hybrid learning.

Table 10 The results of hypotheses testing

Hypotheses	Results	Conclusion
H1: There is a significant relationship between students' learning objectives and learning efficiency for learning English using Computer English MOOC in hybrid learning.	Learning objective → Learning efficiency is significant (P= .026)	Accepted
H2: There is a significant relationship between students' learning methods and learning efficiency for learning English using Computer English MOOC in hybrid learning.	learning methods → Learning efficiency is not significant (P= .982)	Rejected
H3: There is a significant relationship between students' learning concentration and learning efficiency for learning English using Computer English MOOC in hybrid learning.	learning concentration → Learning efficiency is significant (P= .000)	Accepted
H4: There is a significant relationship between students' collaborative skills and learning efficiency for learning English using Computer English MOOC in hybrid learning.	collaborative skills → Learning efficiency is significant (P= .000)	Accepted
H5: There is a significant relationship between teacher supervision and learning efficiency for learning English using Computer English MOOC in hybrid learning.	teacher supervision → Learning efficiency is significant (P= .025)	Accepted

The fast progress of technology is a positive development for the field's ongoing research. Technology now permeates practically every aspect of our life, making it more and more impossible to avoid it. The present research investigate the students' learning proficiency via Computer English MOOC. Learning is the process that provides students with knowledge and abilities that they may apply in a variety of life situations(Kashmiri et al., 2020).This study shows the technology used English learning proficiency. There is a natural connection between language and technology. Large volumes of language would have been needed to create every technical marvel. According to Mahmud (2018), hybrid learning had a favorable impact on academic achievement. Comparing this style of learning to the traditional learning strategy, this current study is thought to provide a more thorough understanding of the effect it has on learners' learning proficiency. The claim that learning must include fun is supported by professionals.

The present research, drawing insight from prior research, has theorized that four aspects of students' learning via Computer English MOOC can benefit learning proficiency. First, learning objective has positive correlation with learning proficiency; second, students' learning concentration has more positive correlation with learning proficiency and teacher supervision has positive correlation with learning proficiency. Finally, students' collaborative skills have most positive correlation with learning proficiency, which provides an opportunity for teachers to rethink teaching methods and optimize teaching practices via MOOC learning of hybrid learning.

CONCLUSION & IMPLICATION

The Internet has become the most important learning, living, and activity space for contemporary vocational college students. By combining both face-to-face and online education in formal learning environments, hybrid learning offers powerful effects from both. The current pandemic situation forces the globe to use technology to accomplish its objectives. Along with the enhancements in learning proficiency, it is crucial that students participate in collaborative activities during hybrid learning while being highly motivated. It may be concluded that the learning process based on this model is effective because metrics for learning proficiency revealed good values. In this study it is discovered that the outcomes of students' learning proficiency were significantly influenced by their collaboration skills after completing a correlation analysis of all the variables taken into account. These findings show that students' learning proficiency is influenced by learning objectives, concentration on the courses, collaborative skills and teacher observation. During the Covid-19 pandemic, it was not always possible for students to go to school in person, but when it came to learning Computer English, they had clear goals. Students were able to get complete and organized information through hybrid learning. And there is a strong relationship between collaborative skills and learning proficiency via hybrid learning. Collaborative skills have the most significant influence on learning proficiency.

The development of the Internet and information technology has changed the way knowledge is generated, developed, acquired, and disseminated, and human learning and education models will inevitably change accordingly. Hybrid learning cannot be understanded as a technological invention or innovation. It is an inevitable product of the development of the Internet and information technology to a certain stage and a new stage in the history of human learning. Hybrid learning closely combines information technology, internet resources, and education, which is an important innovation and progress in educational models. Hybrid learning has broken down the knowledge barriers of different countries and schools, making high-quality resources no longer the patent of elite universities, and will play a greater role in educational equity. Hybrid learning focuses on cultivating students' learning initiative, stimulating their interests, and integrating them into teaching activities. Through big data mining and analysis of the learning process, students' learning status is timely understood, greatly improving the quality of education. In summary, blended learning is not only a brand-new learning method, but also a brand new learning concept, which has a significant and profound impact on current teaching models, teaching methods, and educational concepts.

The current study, which intends to close a significant gap in the literature, has investigated the potential of hybrid learning as a disruptive educational tool. The study also looked at how hybrid learning might help students who are studying for a career strengthen their learning skills. The findings showed that collaborative learning, teacher supervision embedded learning proficiency, and hybrid learning can all significantly improve a student's ability to learn.

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The Impact of Educational Technology on Distance Learning in The Era of Post-Covid-19

Nurdayana Mohamad Noor

Centre for ODL Experiences, Wawasan Open University, Malaysia
nurdayanamn@wou.edu.my
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ABSTRACT

E-learning is a type of electronic educational technology that enables online or distance learning to become the norm even before the COVID-19 era. It is a depiction of convergent products, services, and activities that have emerged in the digital media space and are thought to be more efficient at delivering learning and content, resulting in time and cost savings, and having a smaller negative impact on the environment. Based on existing research, the problem area of this study is to understand how technological convergence provides opportunities to promote the convenience of distance learning and its effect on society, as well as the barriers to the idea remaining implemented post-COVID-19. This paper collects data through semi-systematic literature review based on similar theme which are educational technology, distance learning and education during and post COVID-19. The primary objectives of this article are to analyse and discuss the impact of educational technology, as well as to discuss the implications of distance learning, particularly after the world was compelled to embrace it during the COVID-19 lockdown. In summary, it appears that educational technology is growing more interactive, mobile, immersive, and ubiquitous in the second decade of this twenty-first century. The development of digital platforms and tools, the availability of digital content to adult professionals, and self-paced continuous learning appear to be the key components of the learning of the future. Although there are numerous challenges such as infrastructure and internet accessibility that must be addressed, distance learning has a bright future, and e-learning is the most effective tool for achieving it. More research is needed to shed light on educational technology as a product of technological convergence, which are not only about unification and commonality, but also about divergence in various aspects and opportunities.

Keywords: e-learning, distance learning, educational technology, online education during pandemic, post COVID-19

INTRODUCTION

Educational technology or also known as e-learning, along with Moodle and online library database are ones of the many forms of electronic educational technology that have been implemented in most higher education institutions (HEIs). They have become an important part of society today especially when COVID-19 hits the world in 2020 (Schneider & Council, 2021). The definition of educational technology has evolved in response to changes in socio-economic structures, with different evolutionary stages identified: instructional design, message design, simulation, and a focus on learning environments (Bozkurt, 2020). Research within educational technology focuses on technology integration, attitudes towards emerging technologies, and learning environments, with technology serving as a tutor, teaching aid, and learning tool. As an extensive selection of digitization approaches, mechanisms, and delivery techniques, students are now required to have at least

fundamental information technology literacy, a constant Internet accessibility, and a functional electronic device as a tool for a more convenient learning experience. The popularisation of the Internet has brought all these aspects; mainly computing, information and communication technology (ICT), communication networks, and media content into a whole new level of development in educational technology. Hence, e-learning is one of the examples of convergent products, services and activities that have arisen in the digital media space which is believed to be more effective in learning and content delivery, time and cost saving, and cause less environmental impact (Singh et al., 2021).

With the convergence of traditional and new media, the entire process and outcome has changed not only the technology but also its application (Blakeborough, 2014). We have become so reliant on digital media and its devices that keeping up with the rapidly changing technological innovation is essential in order to unlock better opportunities in life that we might have missed if we turned our backs on the digital realm. However, there is a limitation in ensuring that all media consumers can afford or access the luxury of easy Internet access (Tang & Chaw, 2015). Even within the same country, due to geographical conditions and local demographic background, it is not guaranteed that the total population will benefit from such infrastructure. There is a lack of exposure to technology and computer literacy in some low-income countries. This kind of community is often left far behind by more sophisticated higher socioeconomic communities, and the highly advanced technology we are served today will widen the gap between them and us.

Besides addressing consumer accessibility, organizations and institutions must enhance their digital capabilities to keep pace with today's technological demands, especially in the post-COVID-19 era where virtual and distance learning, remote work, and digitalization have become the norm. Research is essential to understand current trends, acceptance, and effectiveness in distance learning (Serrano-Santoyo & Cabrera-Flores, 2014), and this study examines the impact of technological convergence and divergence on educational technology and its implications for distance learning. Through a semi-systematic literature review (SSLR), the study explores key aspects of distance learning and the application of educational technology resulting from digital and technological convergence during and after the COVID-19 pandemic. The SSLR methodology is particularly valuable for investigating complex topics like digital convergence and divergence in educational technology, allowing researchers to identify key themes and gaps in the literature. This SSLR allowed us to conduct research on these topics by answering the following research questions:

- What are the current debates in educational technology and distance learning literature?
- What are the concerns identified in the literature on distance learning and educational technology during and after COVID-19 pandemic?

This research is structured as follows. In Section 2, the research methodology is presented. The review results are summarized in Section 3. In Section 4, the discussion, the limitations of this research, and propositions for further research are provided. Finally, in Section 5, the main conclusions are summarized.

MATERIALS AND METHODS

The first step of the SSLR was the selection of the keywords. The aim for the keywords included was to comprehensively cover the topic and research questions, considering the complexity of consequence of educational technology and the fact that it affects distance learning within the parameters of during and after COVID-19 pandemic. Therefore, the keywords were defined in a broad sense to include other possible factors such as environmental, demographical, social, and economic aspects of educational technology as a product of digital convergence and all areas and activities of distance learning and e-learning and the divergence effects. One significant benefit of employing this interdisciplinary approach is the enhanced understanding of these issues through robust cognitive skills and critical reasoning (Mohamad Noor et al., 2023). The literature was identified from Google Scholars with keyword search string of "educational technology" and "e-learning" and "distance

learning" and additional of "COVID-19" for the second phase. The filter for the year of publication is from 2019 to 2021. To ensure that the literature was accessible, the literature chosen was limited to English only. Since peer-reviewed scientific journal articles were believed to be the most useful, we also focused primarily on them. As a result, the source types for the search were restricted to journals, and the document types to articles, reviews, and conference papers. The process flow is presented in Figure 1 and the result is presented in Figure 2. Ten research papers were chosen for this conference paper based on their relevance to the theme.

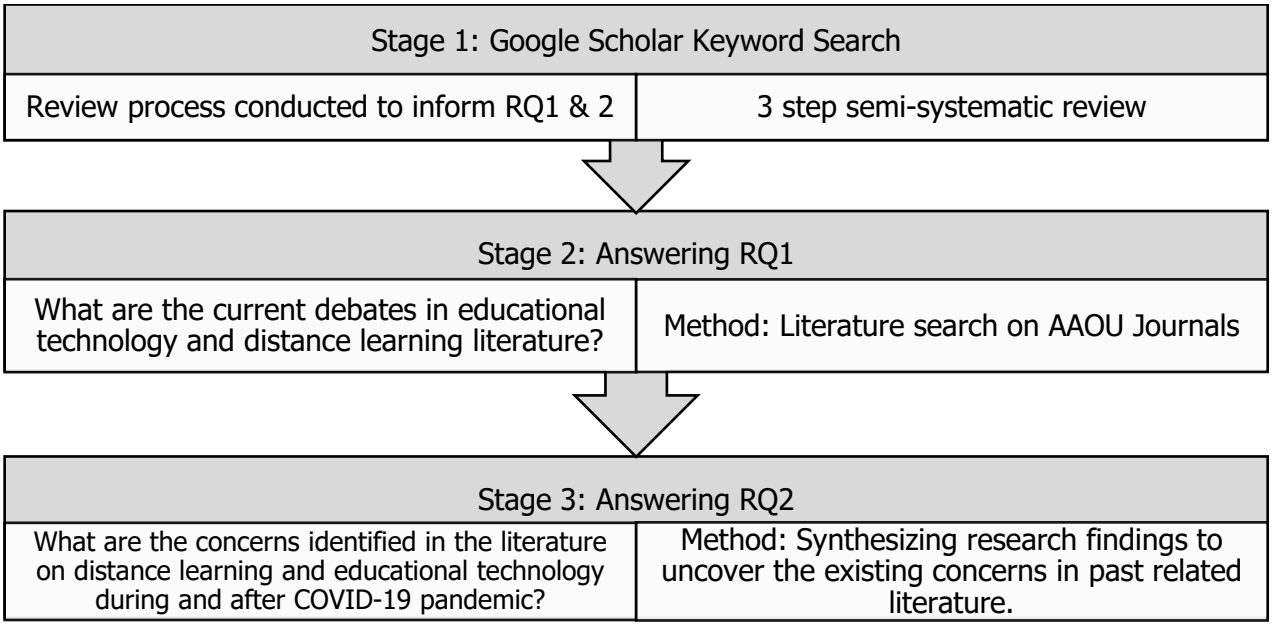

Figure 1 Outlining the semi-systematic three-stage review process

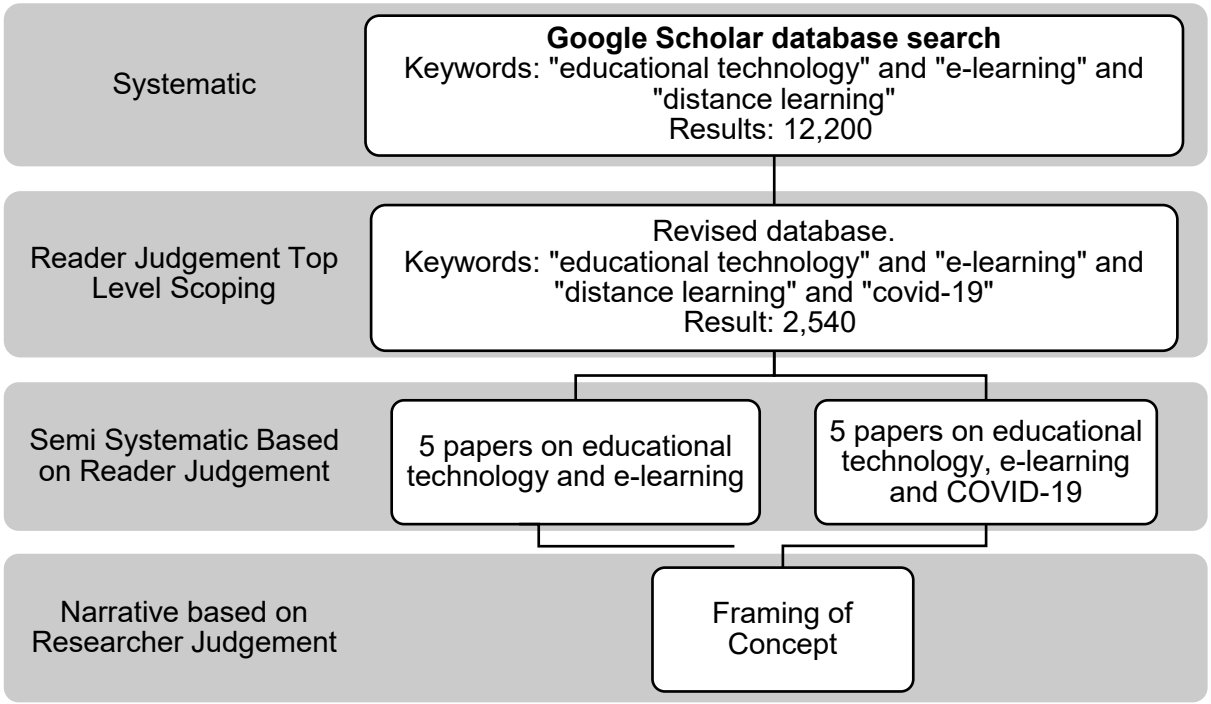

Figure 2 The result of the semi-systematic process.

RESULT

Based on the ten selected relevant research papers that this article has reviewed, the result is presented in the tables that highlight the title of the papers, the authors, the research topic or questions, and lastly the results along with its findings. The first five studies are reviewed to find answers to the first research question pertaining to relevant literature on educational technology and distance learning that can be found when investigating the impact of educational technology, while the other five studies are reviewed to answer the second research question which is to identify the concerns of distance learning and educational technology during and after COVID-19 pandemic.

Educational Technology and Distance Learning

Many scholars presented their models of convergence, which share similarities in presenting concepts such as cooperation, cross-promotion, content sharing, integration, or combination (Vukanovic, 2018). Combinations of components into a prospective common media instrument are brought together as a device because of the purposes that they provide when in use, not because of the technology that has been combined, yet in some cases, the components are the only combination to generate a new device. As a result, these multiplatform that combine features from several media, giving birth to new technological platforms. In the educational technology, e-learning is made possible as a whole different product that offers more convenience and accessibility in education and enable distance learning. Hence, educational technology field are required to continuously redefine their contents for them to continue their presence or availability online to meet the transformation of media consumers' trend. Therefore, we analysed the current relevant literature on the educational technology and distance learning from 2019 to 2022. Table 1 presents five studies that were found with the keyword "educational technology" and "e-learning" and "distance learning".

Table 1 Articles from the educational technology category focusing on distance learning.

Title	Author	Research Topic / Question	Results and Findings
A survey on educational technology in Saudi Arabia.	Abouelnaga et al., 2019	Investigation of the emerging e-learning in Saudi Arabia (KSA); highlighting the usage account of educational technology in this country since the mid-1900s.	Higher education in Saudi Arabia is rapidly expanding due to the use of educational technology that has improved the educational process as well as Internet usage in the country, which is expected to grow rapidly. This also helped Saudi universities climb the global university rankings.
Facilitating student engagement through educational technology: towards a conceptual framework	Bond & Bedenlier, 2019	Establishing a bioecological framework and the microsystemic facets of technology, based on the definition of student engagement.	Advanced educational technology can significantly influence student engagement in the K-12 and higher education classroom.
Educational technology research patterns in the realm of the digital knowledge age	Bozkurt, 2020	A systematic review of educational technology research patterns.	The educational technology field is dominated by three areas, social sciences, computer science, and engineering and it is more advanced in developed countries such as the US and UK.
Technology as infrastructure for change: district leader understandings of 1:1	Lamb & Weiner, 2021	Understanding and approaching technology programs in new and more effective ways.	The embedded 1:1 technology can foster a change in physical, cultural, instructional, and leadership infrastructures and has the

educational technology initiatives and educational change			potential to support changes to teaching and learning across the system.
The nature and building blocks of educational technology research	Valtonen et al., 2022	Analysis of how technology can support learning processes based on different learning theories and understanding of technology-related learning processes that focus on learners' characteristics, especially their learning skills, motivation, and self-efficacy.	Study goals and themes do not change rapidly as a result of new technology alone; more research should focus on the roles of different models built to understand the integration and use of educational technology

These studies yielded similar discussion and conclusions, emphasising the importance of technological advancement in the current educational settings to improve not only students' learning experiences through better students' engagement, but also the quality of the education system, which ultimately increases the rank or reputation of the said universities. It is also essential to remember that, even if technology is seen as a crucial aspect in progressing education, it should not be considered a replacement for in-person training (Abouelnaga et al., 2019). Nevertheless, technology should be viewed as a means of achieving the desired learning outcomes, with educational technology usage intended to improve learning environments and students as a vital component in the teaching and learning processes. The definition of student engagement is also influenced by a range of internal and external factors (Bond & Bedenlier, 2019). Understanding the range of influences on student engagement is also helpful in focusing on how certain factors such as cognitive engagement, critical thinking, and learning from peers, affect engagement. Students are more likely to participate in the learning when they feel empowered in their learning community, which will then reflect in the activities and learning environment through their energy, effort, and engagement.

Decision-makers represented by district leaders in one of the literature have identified technology as a mechanism of systemic change embedded in the physical, cultural, instructional, and leadership infrastructures that adopted the 1:1 programme approach to educational change (Lamb & Weiner, 2021). This programme refers to the concept of schools providing every student with their own computing device for learning purpose. The use of 1:1 device led to changes in the instructional infrastructure as district leaders pushed instructors to modify their curricula and teaching methods, boost student support, and alter their roles in the classroom. For instance, new chances for communication and collaboration increased as district leaders improved the cultural and educational infrastructure by strengthening their wireless networks, and teacher-student interactions and the curriculum also underwent changes. However, this approach also transformed teachers' responsibilities from being information providers to facilitators, making adults become guides who assist students in understanding and applying new information rather than information providers. The role of a teacher is considerably diminished by students having easy access to the Internet and information through their devices.

One of the literature also presents a review on past research and concluded that most of the educational technology studies emphasise learning processes, be it face-to-face or online learning; the users' readiness in integrating technology into teaching and learning, which particularly focuses on teachers; the users' skills in using technology, which comprises of self-efficacy, motivation, engagement; and finally, the instructional design and approach based on the commonly used learning taxonomies (Valtonen et al., 2022). However, the field of educational technology also has grown enormously where the tone and discourse surrounding educational technology have changed from earlier times of e-learning , and then to m-learning (mobile learning), and now u-learning (ubiquitous learning), where recent concerns have shifted from technology ontology and ongoing efforts to demonstrate the efficacy of educational technology to ethical and equity concerns (Bozkurt, 2020).

Educational Technology During Covid-19

Due to the current COVID-19 pandemic, educational technology is now more crucial than ever because everyone must adapt to a virtual environment in both professional and educational settings. Critical societal functions and services may be significantly impacted by these sudden and unplanned changes where people had to work and study from home after COVID-19 and were placed in quarantines (Bergdahl & Nouri, 2021). The news was regularly reporting on the occurrences, informing about deaths, imposing limitations, and restricting civil rights, which also might have increased the scarcity of food and supplies (Abuhammad, 2020). Governments in many countries therefore resorted to declare that the compulsory education should make a shift into distance education as a result of school closures to stop the spread of this epidemic disease. The mandate for transitions into distance learning have shown that schools interpret the new conditions in a variety of ways, indicating that officials need to prepare for transitions and communicate guidelines clearly. Therefore, the following Table 2 presents five studies that were found with the keyword "educational technology" and "e-learning" and "distance learning" and "COVID-19". They are selected based on the relevance of the findings to suit the theme.

Table 2 Articles from the educational technology category focusing on COVID-19 pandemic

Title	Author	Research Topic / Question	Results and Findings
COVID-19 and Crisis-Prompted Distance Education in Sweden	Bergdahl & Nouri, 2021	Exploration on the transition from traditional teaching into distance teaching in Swedish schools enforced by COVID-19.	The school preparedness was mainly related to technical aspects, and that teachers lack pedagogical strategies needed in the emerging learning landscape of distance education. There are many challenges faced during the transition which should be improved in future in order to ensure continuity of distance education.
The transformation of education during the corona pandemic: exploring the perspective of the private university students in Bangladesh	Shahriar et al., 2021	Exploration on the practice of online-based distance learning in private universities of Bangladesh and the challenges associated with it.	Common symptoms of underdeveloped nations, such as inadequate technological infrastructure development, device or internet accessibility restrictions, and budgetary challenges, might sabotage the cohesion of the online learning experience. A great deal of tension and psychological stagnation have been brought on by the lack of computer literacy in both the teachers and the students.
Problems faced in distance education during Covid-19 Pandemic	Gül Özüdoğru, 2021	Investigation on the problems faced by pre-service teachers in the distance education process, which has been implemented during the Covid-19 pandemic.	The main problems faced by the pre-service teachers includes the lack of time spared for live courses regarding "implementation"; failure of establishing communication with friends regarding "student"; absence of internet regarding "impossibility", sound problems regarding "technical" and lack of communication regarding "instructor".

Title	Author	Research Topic / Question	Results and Findings
Enablers of technology agility in higher education	Menon & Suresh, 2022	Identifying and encapsulating the enablers in facilitating technology integration in higher education and understanding the interplay between technology agility enablers.	The COVID-19 pandemic has catalysed the diffusion of technology across the education sector in India, with eight technology agility enablers identified as the most significant enablers, particularly government initiatives and institutional commitment as enablers that can promote technology agility in higher education.
Barriers to distance learning during the COVID-19 outbreak: A qualitative review from parents' perspective	Abuhammad, 2020	Exploring the perceptions of parents regarding the challenges of distance learning faced by their children during the coronavirus outbreak in Jordan	There are four underlying themes; personal barriers, technical barriers, logistical barriers, and financial barriers. Parents daily routine are affected in order to help school in teaching students where there are challenges in assisting their children with distance learning during the pandemic.

These five studies do not share similar research objective, and therefore the findings are diversified. However, the common conclusion is set on the technical difficulties to adapt to the sudden change for virtual learning and classroom in such an abrupt manner due to the pandemic. Learning becomes increasingly complex as a result of the transition from the physical classroom to synchronous and asynchronous interactions across platforms, while social distancing and social isolation through digital technologies generates negative effects on general well-being regardless of age and context (Bergdahl & Nouri, 2021). Lack of time set aside for live classes and homework, an excessive workload from homework, a lack of implementation for major area courses, an unclear evaluation system, restricted access to registered courses, and lower interaction are among the issues with the implementation of distance education (ÖZÜDOĞRU, 2021).

While synchronous and asynchronous teaching should balance individual work with synchronous peer-peer or peer-teacher interaction, some educators go so far as to suggest that students should follow previously communicated instructions and that a minimum amount of time should be set aside for interaction (Bergdahl & Nouri, 2021). Not only teachers, students also reportedly encountered technical issues such as compatibility issues and browser crashes during online classes because they are unfamiliar with technology and online class procedures, which is confusing and inconvenient, especially when different classes require different software and Web portals (Shahriar et al., 2021). Students are also having problems communicating with friends and concentrating, not feeling the classroom environment, being unfamiliar to the system, lacking information, abilities, and attitudes, and feeling the urge to socialise while remaining passive.

The parents of the students were also affected when trying to help prepare their children for online and virtual learning with the challenges of lack of training and support, lack of technical expertise, inadequate communication with professionals and lack of qualifications (Abuhammad, 2020). These are regarded as personal barriers where they feel would affect the standard and quality of their children's distance learning experience. Some parents also raised the concern of logistic barriers and claimed that the introduction of distance learning was not fair as their children were not prepared to use distance learning as the main medium of education learning, and that their children lacked computer proficiency (Abuhammad, 2020). The financial barriers also existed where some parents could not afford compatible technological devices to meet the school requirements for distance learning. The requirement for the internet is also troublesome as it is not free and data usage is not unlimited.

This is where the crucial enablers, which are government policies and initiatives, and institutional commitment, should be rolled out and employed to facilitate the integration of technology into the education system, especially in HEIs, particularly during the COVID-19 pandemic (Menon & Suresh, 2022). These enablers are also essential for triggering the low driving force enablers, which include Gen Z learners with high dependence power and educators' beliefs and skills. At the institutional level, management must develop policies and procedures that support a common understanding of how to integrate technology and should give faculty members the time they need to develop their ICT skills, incorporate new information into their lessons, and meet predetermined objectives. The technical preparedness in terms of not only infrastructure, but the most important thing is human capital, and thus investment of both money and energy should be focused more.

Based on the findings from these past studies, it is apparent that educational technology is growing even before the COVID-19 era, and the momentum of the emergence of this technology somewhat helps the world adapt to distance learning when the pandemic hits the world in 2020 (Khuong, 2022). The advancement of technology, especially in the digital convergence and divergence perspective where various technological tools are produced and utilised in various sectors, has enabled educational technology to become more interactive, mobile, immersive, and ubiquitous. The advancement of digital platforms and tools in education, such as Moodle, Learning Management System (LMS), e-learning, and even Google products such as Google Classroom and Jamboard, has benefited not only young students but also adult professionals who enrol in part-time studies. These platforms and tools offer the availability of digital content to them and assist their self-paced continuous learning.

However, there is a growing concern that the literature shares, and that is the technology preparedness by the instructors or teachers, institutions or universities, and the learners. The lack of digital and technological skills by the teachers and their reluctance of practicing the online distance learning hinders the smooth implementation of this distance learning and virtual classroom. It affects the effectiveness of educational technology and the quality of education received by the students virtually. This also contributes to the sociocultural pressures that influence user identity and interaction within unfamiliar learning communities in digital language education (Bond & Bedenlier, 2019). If students find the use of instructional technology to be meaningful and applicable in their lives, it allows them to act without pressure. It is thus important to give students the chance to take an active role in their learning, activity, and technology selection, as well as through collaborative activities, which can only be achieved if the teachers as instructors are more technically skilled and tech savvy to teach and pass the skills to the students.

Apart from this, insufficient technological infrastructure growth, device or internet accessibility limitations, and economic challenges have also adversely affected the consistency of the online learning experience(Quyen, 2022). This concern allows the growth of the never-ending problem in the digital world called the digital divide. A digital divide is one of the convergences of undesirable products that describes a gap between two communities based on their accessibility to information and communication technology and their ICT literacy. Those who have ready access to information and communication technologies are mostly represented by higher socioeconomic communities in developing or developed countries, while those who do not have the access or skills to use those same technologies within a geographic area, society, or community are those with lower socioeconomic status or living in lower income countries.

According to some communication researchers, the Internet accentuates social inequality, which has resulted in social structural division (Bozkurt, 2020; Park, 2017). The focus of the digital divide is not on the physical accessibility of the Internet connection but rather on the ability and creativity of the Internet connection. The ability to adapt to changes in educational technology in the learning and teaching environment as well as in the workplace is a skill that employers, instructors, and even teachers must possess. In order to manage information effectively, new skills, new channels for information communication, and great innovative categories that take advantage of these growing information structures are all needed. Remarkably, it was found that the COVID-19 epidemic was the most important enabler in changing the educational landscape, aiding in the establishment of a new

paradigm and accelerating the adoption of technology in higher education (Menon & Suresh, 2022). This prompted policymakers and educational institutions to review and revise their policies and procedures, which in turn led to the utilization of educational technology in higher education operations.

The digital gap should be addressed efficiently by the government and the community itself by using the top-down and bottom-up approaches respectively. By providing telecommunication infrastructure and identifying other factors that contribute to the digital divide in terms of demographics, age, gender, and other factors, the issue can be addressed (Bond & Bedenlier, 2019; Khuong, 2022; Shahriar et al., 2021). The effect is not only based on socioeconomic background but also based on varied mindsets and generations. Teachers and instructors from older generations tend to be digitally illiterate or refuse to learn and adapt to technological devices in education, intentionally digging the gap in the digital divide in educational technology. These marginalised groups are not just passing up a major opportunity for the accommodation, access to data, and rate of correspondence managed by advanced innovations; they are likewise passing up a major opportunity for the open doors that accompany them.

Another limitation for this educational technology is its guaranteed accessibility and implementation globally or nationally. The sophisticated network communication infrastructure that transmits the 5G LTE networks is usually not available nationwide in most countries. They are mostly focused on higher socioeconomic cities with demographics that can afford such service. The other concern is the affordability of this technology in lower socioeconomic communities. The challenge now is the convergence of networks initiated by the above discussion and the expansion of the concept of "electronic information superhighway", signifying a broadband-switched network infrastructure, but if it does not reach to all communities, there will be a social gap dividing humans instead of connecting them and bringing them closer.

CONCLUSION

Technological convergence has turn into an imperative component of life for most individuals these days. Due to interoperability and convergence with other media, they have enabled the educational platforms and tools we have today to combines content, provides variety of choices, and promotes social collectivity. Interoperability, the term used to explain compatibility between different devices running on different operating system; is what encourages even more connectivity and involvement in terms of social, education, work, and business. In empowering the employment of distance learning as an educational technological tool, the main actors of education, such as teachers, lecturers, and instructors, apparently are not allowed to lack any foundational skill in pandemics and school responses. Teachers and decision-makers cannot wait until the outbreak is over to make decisions as it is important for the educational sector to develop contingency plans to ensure safe and functional schooling in times of crisis. Information must be released in a timely manner in order to be effective. Digital divide should also be addressed in making sure educational technology and distance learning are reachable and beneficial to all walks of life.

Although physical access to online and distance education is inherently unequal between users throughout dissemination, it is essential that everyone in society have an equal chance to access it and benefit from it. The basic tenet is that individuals who do not integrate with educational technology may live in situations that are more unbalanced due to a lack of physical access as well as socioeconomic inequities. Despite the growing potential and advantages of online education access, digitally disengaged communities have a higher propensity to be isolated. In other words, those who cannot afford to use Internet-enabled technological tools cannot benefit from online resources and, as a result, are marginalised in society.

This semi-systematic review paper has several limitations. The review is based on ten past studies; therefore, the number of concerns or issues pertaining to the keywords and theme of educational technology, distance learning, and COVID-19 pandemics might be more than what is

found and discussed in this review. The literature also does not categorise the studies by geographical location to identify varied issues in different socioeconomic settings. Additional relevant literature should be reviewed in order to identify the alarming concerns about educational technology and distance learning that might hamper the rise of this positive and advantageous technology. The data collection was also limited to the selected literature and thus might not represent a larger group of users and practitioners in the educational technology and distance learning industry. Yet, the literature is diversified in terms of its research objectives and topics, so the review helps to synthesise the common shared research issues and gaps in this field. The optimization of this convergent technology depends highly on the researchers and scholars who scrutinise the application, the implementation, the impacts, and the advancement of educational technological platforms and tools that can enhance online and distance learning or ubiquitous learning (u-learning).

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Using TED Talks Videos to Improve Speaking Skills Among Secondary Students in Kota Kinabalu, Sabah

Feng Tian Yi[1], and Noraini Said[2]

[1,2]Faculty of Psychology and Education, Universiti Malaysia Sabah
BP19170002@student.ums.edu.my ; noraini.said@ums.edu.my
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ABSTRACT

This study investigates the incorporation of TED Talks videos as a pedagogical tool in secondary language instruction, with a specific emphasis on improving speaking fluency and students' attitudes toward learning. By recognizing the increasing importance of multimedia in language acquisition, the research aims to uncover the tangible benefits of integrating TED Talks videos into language lessons. Utilizing a quasi-experimental design with control and experimental groups, the study combined quantitative analysis of pre-tests and post-tests with qualitative insights gathered from a Likert questionnaire. The outcomes strongly indicated that students exposed to TED Talks videos exhibit significant advancements in their as indicated by the significant mean value of post-test scores between the experimental and control groups. Additionally, the research highlights the pivotal role of authentic materials in enhancing motivation and fostering positive learning attitudes. This research also delved into the wider implications of these findings for language instruction, underscoring the potential of multimedia resources to revolutionize conventional teaching methodologies. Beyond the classroom, the research envisions an education landscape where innovative techniques, such as the incorporation of TED Talks videos, reshape language teaching. By addressing pedagogical and motivational facets, the study advocates for contemporary resources to create engaging and effective learning experiences. The research encourages educators to explore how multimedia interacts with diverse learners and cultural contexts, ultimately promoting dynamic instructional approaches aligned with evolving educational needs.

Keywords: *TED Talks videos, quasi-experimental design, positive learning attitudes, evolving educational needs*

INTRODUCTION

The introduction explores the context of English language education in Malaysia, where students are exposed to multiple languages, including Bahasa Melayu, English, and Mandarin, from a young age. In recent years, the Malaysian Ministry of Education has placed significant emphasis on attaining a proficient level of English language skills, aiming to equip students for success in an increasingly globalized world. As part of this effort, the study proposes to use TED Talks videos as a teaching tool in secondary school English classes, incorporating Communicative Language Teaching (CLT) principles and video-based learning.

This study roots its theoretical foundation in Communicative Language Teaching (CLT), a pedagogical approach underscoring the role of authentic communication in language acquisition. TED Talks possess the potential to inspire and engage learners, thereby contributing to enhancing public speaking abilities and language learning outcomes. The literature review conducted in this study examines English language education within Malaysia while also drawing attention to authentic learning materials, such as TED Talks. These materials are envisioned to play a pivotal role in heightened comprehension and listening skills.

Two main objectives drive this research: firstly, to explore the use of TED Talks videosto improve students' speaking fluency and secondly, to find out students' attitudes towards the use of TED Talks videos in speaking lessons. In pursuit of these objectives, the study presents two research questions. A quasi-experimental design is adopted, employing two distinct groups of secondary school students. The data collection process will encompass pre-tests and post-tests, gauging the evolution of the students' speaking fluency. Additionally, the research will encompass surveys and focus group discussions for comprehending students' perspectives, opinions, and sentiments regarding using TED Talks videos.

In summary, this introductory section establishes the quasi-experimental study's foundation, with the goal to enrich English language education in Malaysia by harnessing TED Talks videos. Through applying CLT principles and integrating video-based learning, the study endeavors to elevate students' speaking skills and reshape their dispositions toward language acquisition. This undertaking can bolster national language education practices and foster a more engaging learning landscape.

Hence, the paper delves into the efficacy of employing TED Talks as a pedagogical resource within English language classrooms in Malaysia. The study primarily focuses on assessing its influence on students' speaking fluency, alongside its potential impact on shaping their perspectives regarding language learning. In the pursuit of these goals, this study priorities tackling the following research questions:

1. Does the use of TED Talks videos help to develop students' speaking fluency?
2. What are students' attitudes towards the use of TED Talks videos in speaking lessons?

LITERATURE REVIEW

English Education in Malaysia

This literature review focuses on the landscape of English language education within Malaysia, spotlighting the hurdles both educators and learners confront. An emphasis on test scores within Malaysia has resulted in students struggling to effectively speak and write English (Musa, 2012). Challenges are particularly present in pronunciation, fluency, spoken English vocabulary, and writing skills. In response, educators are urged to establish a more captivating learning environment, advocating for adopting video-based instructional techniques, such as TED Talks. This approach can invigorate critical thinking and embolden students to communicate with greater assurance (Nursafira, 2020).

Central to this is the recognition of TED Talks as instructional resources poised to enhance students' prowess in spoken English. Nonetheless, the review accentuates a gap in the existing literature concerning concrete methodologies for effectively integrating video-based learning into classroom contexts. Within this gap, the present study takes root, striving to explore the influence of TED Talks videos within English language classes in a secondary school in Sabah, Malaysia. By doing so, the study seeks to contribute valuable insights into this context.

Video-Based Learning

The literature review embarks on a journey through the historical progression and transformative trajectory of video-based learning, underscoring its role as an interactive pedagogical instrument. A study by Rich (2011) reveals that video-based learning has garnered favourable feedback from educators and learners alike, with teachings citing heightened engagement with students and enhanced job facilitation. Empirical investigations have unveiled that students who engage with video-based learning exhibit commendable performance on assessments. Greenberg's work (2012) adds weight to this perspective, advocating for its integration, particularly for the younger demographic.

Nevertheless, within the existing literature, a discernible void persists regarding the concrete methodologies and approaches teachers should embrace when integrating video-based learning. While prior research has illuminated the outcomes of video-based learning, manifesting as enhanced test scores and altered student behaviour, the realm of practical implementation remains less explored, a point articulated by Giannakos (2013). This study addresses this gap by exploring how teachers use video-based learning and its effectiveness in improving students' learning experiences and outcomes.

TED Talks as Teaching Material

The literature review highlights the increasing significance of enhancing English-speaking abilities in countries where English is not the primary language. Video-based learning, especially through TED Talks videos, has emerged as a promising approach. TED Talks' extensive collection of videos featuring native and non-native English speakers covering diverse topics has proven highly effective in English language classes. The engaging nature of TED Talks videos captures students' attention and boosts their motivation to actively participate in discussions while exploring various subjects (Sailun, 2018).

Research has demonstrated the positive impact of integrating TED Talks videos into classrooms, enhancing students' learning experiences (Choirunnisa, 2021). Students value the opportunity to learn from skilled speakers and find these videos particularly beneficial in improving their English comprehension. Moreover, TED Talks' renowned reputation for excellent public speaking is an authentic resource for enhancing oral communication. However, despite these encouraging findings, there remains a lack of standardized methods for teachers to effectively utilize video-based learning in classrooms. Further research is necessary to identify best practices that maximize the impact of TED Talks on English language acquisition and overall learning experiences.

Studies on Students' Attitudes Towards TED Talks Videos

Using TED Talks in English language classes usually follows a three-step process: pre-watching, while-watching, and post-watching. Before playing the video, teachers engage students by asking questions to pique their interest. During the video, students pay attention to vocabulary and the speaker's accent or dialect. Afterward, students may be assigned tasks such as giving a presentation or engaging in discussions to explore the video's significance and the lessons it imparts.

Saputra (2016) showed that activities involving TED Talks videos help handle motivational issues and improve student engagement in class. Students find it easy to watch the videos and learn more effectively through visual and auditory means. They also appreciate the opportunity to express their opinions and respond to video content.

Furthermore, Choirunnisa's (2021) Research on students' attitudes towards TED Talks videos demonstrates that most students respond positively to their use in English-speaking classes. Students believe that watching these videos improves their English communication skills and provides various advantages, such as learning effective communication techniques, critical thinking, pronunciation, fluency, and more.

METHODS AND SAMPLING

The researcher employed a quasi-experimental design involving both control and treatment groups. This research approach integrates quantitative evaluation through pre-tests with qualitative perspectives garnered from a Likert questionnaire, which is based on the notion that scientific knowledge should be obtained through objective measurement (lharahsheh & Pius, 2020). In the case of this study, the research aims to find out whether combining traditional teaching methods with video-based learning can enhance language learning for Malaysian students. Therefore, this study adopted a positivist research philosophy because positivists hold that there is one objective reality that exists apart from our subjective experiences, and that this reality may be uncovered and comprehended via the application of scientific rigor and procedure (lharahsheh & Pius, 2020).

The research design was quasi-experimental, as the researcher had limited control over participant assignment. The study involved 72 secondary school students from two different classes. The convenience sampling method was employed to select participants who met the accessibility criteria, and they were divided into control and experimental groups.

Data collection instruments included pre-test and post-test assessments which used an assessment based on Hariyanto's (2016) study as a reference in order to measure students' speaking skills, and a Likert questionnaire to gauge students' attitudes towards using TED Talks in speaking lessons. The pre-test and post-test were then used to compare students' speaking skills before and after the intervention, while the Likert questionnaire provided insights into students' perceptions of the video-based learning approach.

The reliability and validity of the instruments were ensured through previous research and consultation with experienced English teachers. Besides, to assess reliability, the instruments were evaluated through the utilization of Cronbach's Alpha. The tests and questionnaire were validated and modified to suit the background culture of students who attended a public school in Kota Kinabalu, Malaysia. As shown in Table 1, the reliability scale of the questionnaire is stated at a value of 0.893, which shows a high scale of reliability.

Table 1 Reliability Scale of the Questionnaire.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.897	.893	20

A pilot study was conducted to refine the research methods before the actual research at the school. The data collection procedure involved video-based learning for the experimental group and conventional teaching methods for the control group. Experimental group feedback was collected through questionnaires to gain a better understanding of their learning experience and preferences. The total duration of the experiment was conducted for four months and employed the use of six lessons over the course of six weeks. In addition, the TED talk videos used in the study had an average duration of three to seven minutes. For each lesson, the transcript below was provided:

Table 2 TED Talk Videos Employed in this Study

Video	Link
1	"Is It Normal to Talk to Yourself?" https://www.ted.com/talks/ted_ed_is_it_normal_to_talk_to_yourself?language=en
2	"Are Solar Panels Worth It?" https://www.ted.com/talks/shannon_odell_are_solar_panels_worth_it?language=en
3	"Whatever Happened to the Hole in the Ozone Layer?" https://www.ted.com/talks/stephanie_honchell_smith_whatever_happened_to_the_hole_in_the_ozone_layer?language=en
4	"3 Psychological Tricks to Help You Save Money" https://www.ted.com/talks/wendy_de_la_rosa_3_psychological_tricks_to_help_you_save_money
5	"What Really Happens to the Plastic You Throw Away" https://www.ted.com/talks/emma_bryce_what_really_happens_to_the_plastic_you_throw_away
6	"How Do Airplanes Actually Fly?" https://www.ted.com/talks/raymond_adkins_how_do_airplanes_actually_fly?language=en

Ethical considerations were considered, with the school principal and parents of the students participating by signing consent forms.

DATA ANALYSIS & RESULTS

In the following section, a thorough evaluation conducted in alignment with collected data was carried out, seeking an exploration of how TED Talks can be utilized for developing students' speaking fluency. There is also a depiction of findings concerning students' attitudes towards this. The data collection process predominantly employed a quantitative methodology involving a seamless amalgamation of pre-tests, post-tests, and questionnaires. The quantitative data, providing many insights, underwent scrutiny using SPSS (Version 28.0). Additionally, the chapter delves into the validity and reliability of these research methods.

There is quantitative data collected and presented to answer the following research question:

1. *Does the use of TED Talks videos help to develop students' speaking fluency?*
2. *What are students' attitudes towards the use of TED Talks videos in speaking lessons?*

This research study was conducted at a government secondary school in Kota Kinabalu. The participants consisted of 72 students from two different classes with 36 students in each class, the secondary school students aged around 13 with basic knowledge of English. To collect data to answer the first research question, the techniques of pre-test and post-test were used. The pre-tests were given to both control and experimental groups before the intervention of TED Talks videos to measure their speaking fluency. The same level of test was given to both groups after

interventions as the post-test to measure their respective speaking fluency after the treatment. Statistical analyses were conducted using SPSS. The following formulas were used for calculating Total Word Disfluent (TWD), Total Word Attempted (TWA), Word per minute (WPM), and Fluent Speaking Time (FST):

TWD (%) = (TWD/TWA) x 100%
WPM = (TWA/FST) x 60

The students' final speaking fluency scores were obtained using these formulas, and further classification was conducted based on the speaking fluency scores using the following criteria in Table 3 judging their WPM:

Table 3 Word Per Count (WPM) Table

Word Per Count (WPM)	**Value**
Very Good	>130
Good	91 - 130
Fair	51 - 90
Poor	0 - 50

Results of the Pre-test and Post-test of the Experimental Group

The analysis of post-test results from secondary students in Kota Kinabalu, Sabah, following the utilization of TED Talks videos to enhance speaking skills, reveals positive outcomes. The data presented in Table 4 highlights an overall improvement in students' speaking abilities, evidenced by increased speaking time and reduced pauses. Notable variations in individual performance are observed, indicating potential areas for further enhancement. These findings underscore the effectiveness of incorporating TED Talks videos as a means to foster improved speaking skills among secondary students.

Table 4 Examples of Experimental Class Pre-Test and Post-test of Speaking Fluency Level for Three Students

Name of Experiment Students		Total Word Attempted	Total Speaking Time (in second)	Pauses	Total Fluent Time(in second)	Total Word Disfluent	Exclusive Rate(word per minute)	Total Word Disfluent(%)
Student 1	Pre	20	32	2	30	3	40	15
	Post	18	31	2	29	4	37	22
Student 2	Pre	135	56	0	56	0	145	0
	Post	148	54	0	54	0	164	0
Student 3	Pre	87	43	3	40	0	131	0
	Post	110	50	3	47	0	140	0

Speaking Fluency Level Analysis

From Table 5, this study employed frequency statistics to analyze the levels of oral fluency scores before and after the intervention. The results revealed that in the pre-test, 5 participants (13.9% of the total) had a lower level of oral fluency, 15 participants (41.7% of the total) exhibited average oral fluency, 9 participants (25.0% of the total) demonstrated good oral fluency, and 7 participants (19.4% of the total) displayed very good oral fluency.

Table 5: The Statistics of speaking fluency scores before and after the pre-test and post-test in the experimental class.

	Pre-test fluency level		Post-test fluency level	
	Frequency	Percent（%）	Frequency	Percent（%）
Poor	5	13.9	8	22.2
Fair	15	41.7	12	33.3
Good	9	25.0	4	11.1
Very good	7	19.4	12	33.3

In the post-test, 8 participants (22.2% of the total) had a lower level of oral fluency, 12 participants (33.3% of the total) showed average oral fluency, 4 participants (11.1% of the total) achieved good oral fluency, and 12 participants (33.3% of the total) exhibited very good oral fluency.

Results of Pre-test and Post-test of the Control Group

As evident from Table 6 and Table 7, this study employed a paired samples t-test to compare the differences between pre-test and post-test levels of oral fluency. The analysis revealed a significant difference ($P = 0.000 < 0.05$) between the oralfluency levels before and after the intervention. Specifically, the post-test oral fluency score of 98.92 was significantly higher than the pre-test score of 89.08. In summary, the results indicate a noticeable improvement in post-test oral fluency levels compared to the pre-test.

Table 6 Examples of Speaking Fluency Levels, Pre-Test and Post-test Data for Three Students in Control Group

Name of Experiment Students		Total Word Attempted	Total Speaking Time (in second)	Pauses	Total Fluent Time(in second)	Total Word Disfluent	Exclusive Rate(word per minute)	Total Word Disfluent(%)
Student 1	Pre	20	32	2	30	3	40	15
	Post	18	31	2	29	4	37	22
Student 2	Pre	135	56	0	56	0	145	0
	Post	148	54	0	54	0	164	0
Student 3	Pre	87	43	3	40	0	131	0
	Post	110	50	3	47	0	140	0

Paired t-test of the Pre-test and Post-test of Experimental Group

Furthermore, the oral fluency levels were further categorized into two groups: higher proficiency and lower proficiency. The differences in pre-test and post-test levels were then compared for both groups in Table 7.

Table 7 Comparison of Speaking Fluency Results for Experimental Group

	N	M	SD	t	P
Pre-test	36	89.08	32.046	-4.990	0.000
Post-test	36	98.92	38.077		

Paired t-test of the Pre-test and Post-test of Control Group

In this study, a paired samples t-test was employed for scrutinising fluctuations in oral fluency levels across the pre-test and post-test phases for the control group in Table 8. Evaluations unveiled that no substantial disparity (P = 0.731 > 0.05) was evident in the control group's oral fluency levels before and after the intervention. Although statistical significance was not reached, a nuanced observation can be made from the calculated means – the post-test oral fluency score (72.40) slightly surpassed the pre-test score (71.78) within the control group. In summation, a discernible enhancement across the pre-and post-test oral fluency levels of students within the control group was not explicit.

Table 8: Comparison of pre-test and post-test scores in the control group

	N	M	SD	t	P
Pre-test	36	71.78	33.140	-0.346	0.731
Post-test	36	72.40	31.511		

Attitudes Towards TED Teaching

A questionnaire was employed to gauge students' sentiments regarding TED teaching. Through meticulous analysis, it came to light that participants exhibited predominantly favourable attitudes toward TED teaching with varying degrees of agreement as presented in Table 9.

Table 9 Attitudes Towards TED Teaching

Questions	s.disagree	disagree	agree	s.agree	Mean	Std.Dev
Do you know what audio materials are?	2 (5.6%)	9 (25.0%)	23 (63.9%)	2 (5.6%)	3.39	1.103
Do you think learning English is important?	5 (13.9%)	5 (13.9%)	12 (33.3%)	14 (38.9%)	3.69	1.470
Do you know what a TED Talk is?	5 (13.9%)	6 (16.7%)	24 (66.7%)	1 (2.8%)	3.28	1.210
Are TED talks fun to watch?	2 (5.6%)	7 (19.4%)	26 (72.2%)	1 (2.8%)	3.47	1.028
Do you enjoy your current way of learning English?	5 (13.9%)	8 (22.2%)	18 (50.0%)	5 (13.9%)	3.28	1.344
Could there be an improvement to your English classroom?	-	10 (27.8%)	19 (52.8%)	7 (19.4%)	3.64	1.100
Would you like a different method of learning English?	4 (11.1%)	8 (22.2%)	17 (47.2%)	7 (19.4%)	3.42	1.339
Does adding audio & video materials improve your learning?	4 (11.1%)	9 (25.0%)	16 (44.4%)	7 (19.4%)	3.36	1.355
Do you enjoy listening to speeches?	1 (2.8%)	11 (30.6%)	21 (58.3%)	3 (8.3%)	3.39	1.103

Do you enjoy learning things through different speeches?	5 (13.9%)	9 (25.0%)	18 (50.0%)	4 (11.1%)	3.19	1.327
I want more audio and video integration in my classroom.	1 (2.8%)	10 (27.8%)	22 (61.1%)	3 (8.3%)	3.44	1.081
My English oral skills are good	1 (2.8%)	14 (38.9%)	18 (50.0%)	3 (8.3%)	3.22	1.149
I think that TEDTalks can improve my oral skills	3 (8.3%)	6 (16.7%)	23 (63.9%)	4 (11.1%)	3.53	1.158
Would TEDtalks improve your oral skills?	2 (5.6%)	7 (19.4%)	22 (61.1%)	5 (13.9%)	3.58	1.131
Listening to TEDTalks improve my understanding in English.	3 (8.3%)	12 (33.3%)	14 (38.9%)	7 (19.4%)	3.28	1.344
Listening to TEDTalks improve my understanding in English compared to traditional methods.	1 (2.8%)	12 (33.3%)	21 (58.3%)	2 (5.6%)	3.31	1.091
TEDTalks should be used more in listening practices.	3 (8.3%)	12 (33.3%)	17 (47.2%)	4 (11.1%)	3.19	1.261
TEDTalks allow me to improve in speaking.	1 (2.8%)	7 (19.4%)	20 (55.6%)	8 (22.2%)	3.75	1.105
TEDTalks should be used in classrooms more often.	1 (2.8%)	11 (30.6%)	21 (58.3%)	3 (8.3%)	3.39	1.103
The school should prioritize English oral skills more.	1 (2.8%)	9 (25.0%)	23 (63.9%)	3 (8.3%)	3.50	1.056

In essence, the data analysis and results chapter serves as an all-encompassing review of the research findings, highlighting the influence of TED Talks on enhancing students' speaking fluency and overall attitudes. Adopting a mixed-method approach in this study lends a nuanced perspective and enriched insights into the interplay between teaching methodologies and language learning outcomes.

DISCUSSION

Findings of the Study

This portion lays the foundations for discussing the research findings, limitations, and suggestions for later research. In terms of findings, information is depicted in alignment with the research question:

Does the use of TED Talks videos help to develop students' speaking fluency?

In this context, favouring TED Talks caused significant improvements in students' speaking fluency, evident in their elevated speaking duration and diminished pauses during speech. A prevailing sentiment of positivity emerged from students' attitudes, as the majority preferred to use TED Talks as an instructional tool, attributing advantages such as heightened comprehension and refined listening skills. Nevertheless, response exhibits variability, with certain participants exhibiting less enthusiasm towards TED Talks, possibly stemming from their familiarity with similar media or individual opinions. Hypothesis Validation: The study's hypotheses were validated, showing a significant difference in speaking fluency between the control and experimental groups.

As noted by the findings, it was proven that the results of the post-test scores show that the students improved on their oral tests, compared to the control group which did not show much change, which supports Nursafira's (2020) claim that TED talks allow more critical thinking and encourage students to communicate more effectively, as they engage themselves in a native

speaker's environment and process their way of communication, therefore allowing the students to improve their oral skills.

What are students' attitudes towards the use of TED Talks videos in speaking lessons?
The study also confirms that TED Talks videos have a positive impact on speaking fluency. The engaging nature of authentic content contributes to language learning outcomes. Students' positive attitudes toward TED Talks videos suggest their effectiveness in enhancing motivation and interest in language learning. This could revolutionize language instruction by incorporating engaging multimedia resources. The results encourage educators to adopt innovative strategies using real-world content to create more engaging learning experiences and improve speaking skills.

This result is similar to Choirunnisa's (2021) findings, in which students find the videos quite useful in their strive to further understand the language. Compared to Saputra's (2016) study, there is comparatively no difference in the perception of students on activities involving TED talks. Student engagement was increased and preferred these TED talk activities compared to their traditional lessons. Furthermore, Rich's (2011) research claiming that video-based learning receives positive feedback from both students and teachers is proven to be of significance, as students showed a generally positive overview on the implementation of this learning method.

From findings as well as the discussion, it is seen that the study shows the perception of students on the implementation of TED Talks as well as their compatibility with this learning method. The scores after the intervention showed that the students enjoyed the process and improved their oral skills as well through the use of TED Talks, and this conclusion could be used as a step for other teachers and organizations to start employing similar methods to improve the oral skills of students in school.

Limitations
The limited sample size of two classes may not fully represent the population. A larger, randomized sample is recommended. Not only that, the short duration of the study might have impacted the depth of data collected. Moreover, it should be using more authentic materials in tests could provide a better gauge of improvement.

Implication of the Research
This study contributed the data collected about the students' engagement level with the teaching style, particularly video-based learning, in order to find ways to improve and modify it to fit Malaysian culture. The implications of this study extend beyond the immediate findings, presenting valuable insights into the realm of language instruction and educational innovation. By effectively utilizing TED Talks videos as a dynamic teaching tool, educators in Malaysia could utilize this research as a reference in implementing TED talks in their classrooms as an effort to improve the oral skills of their students. As the findings of the study show significant differences between the results of the control group and experimental group, this could be an efficient way for teachers to help their classes improve their speech skills and listening skills without having to drastically change the composition of their lessons.

More importantly, the motivational impact of integrating multimedia resources like TED Talks emerges as an important tool. This study illuminates how such innovative techniques capture students' interest and attention, revitalizing traditional teaching methods and creating a more engaging learning environment. As educators consider the implications, they are prompted to explore new avenues for educational adaptation and advancement. The findings advocate for the integration of modern technology and contemporary resources to enrich language instruction,

reflecting a broader educational shift towards active and effective learning strategies in the digital age.

In conclusion, the implications drawn from this research reverberate beyond the classroom walls, emphasizing the potential of TED Talks videos to revolutionize language teaching. By embracing this approach, educators can enhance vocabulary, address diverse learning needs, and nurture essential speaking skills. The study encourages a paradigm shift in language instruction, promoting educational innovation that aligns with the dynamic educational landscape of today.

Suggestions for Further Research

The data collected for this study were sampled on purpose, on the premise of convenience, so it could not be generalized to represent a population. It is suggested that future research use random sampling and increase the sample size to ensure that the information can be generalized. A comparative exploration could shed light on the distinct advantages and challenges posed by different multimedia resources or traditional teaching methods, aiding educators in informed decision-making. Moreover, investigating the influence of cultural contexts on the effectiveness of TED Talks videos, coupled with exploring the impact of teacher training programs centered on multimedia integration, could provide deeper insights into optimizing educational strategies.

In addition, it is recommended that future researchers include respondents from both classes who are more fluent and mix them in with students who are less fluent to see a better variance in the data findings. Also, extending the inquiry to encompass other language skills and studying students' preferred modes of learning within the TED Talks context would contribute to a holistic understanding of this innovative instructional approach. Furthermore, this idea could be used in such a way that the experimental group consists of less fluent students in order to see the extent of this teaching method compared to a proficient class in a traditional classroom.

CONCLUSION

This study highlights the positive impact of using TED Talks videos to enhance speaking fluency and student attitudes among secondary students. This study validates hypotheses regarding improved speaking skills and favorable attitudes. The implications of these findings extend beyond the classroom, advocating for the integration of innovative teaching strategies to meet the demands of contemporary education. While the study acknowledges its limitations, it serves as a valuable reference for educators seeking effective ways to improve students' speaking skills through engaging multimedia resources. Recommendations for future research focus on expanding sample sizes, comparative studies, cultural context analysis, and exploring teacher training programs. This research contributes to the ongoing discourse on modern language instruction methods and their potential to revolutionize learning outcomes.

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Enhancing English Oral Skills among Malaysian Rural School Students through the Implementation of Virtual Reality (VR)

Muhammad Rapi Bin Zulkifli[1] and Suyansah Bin Swanto[2]

[12]Faculty of Psychology and Education, Universiti Malaysia Sabah
BP19160471@student.ums.edu.my & suyansah@ums.edu.my
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Abstract

This research aims to determine the perception of rural secondary school students on the implementation of virtual reality (VR) as an alternative to the traditional classroom setting, more specifically in the setting of an oral skill lesson. In addition, the perception of the students includes the general perception, motivation levels, interest as well as the skill development of the students when subjected to a VR classroom and their effects on the mentioned aspects. A total of 39 respondents from Sekolah Menengah Kebangsaan Desa Kencana were involved in this research. This study employed a multi-method research design. Based on the results, it is found that the perception of the respondents was generally quite positive and a majority preferred a VR environment compared to a traditional setting in the context of learning speaking skills. Respondents have stated that the interactivity and new experience presented with the VR environment brings new light to their motivation and interest and they showed a keen interest in learning English compared to traditional settings. However, there are several subjects who view the implementation in a negative light, as would be portrayed in the data findings. In conclusion, both research objectives were answered, and several implications were discovered. Several suggestions are recommended in order to further this topic at the end of the research. In conclusion, this research believes that the implementation of VR would be able to increase the motivation, interest and skill development of ESL learners, specifically in speaking skills and therefore investigate whether VR classrooms appear as a better alternative to our current learning environment.

Keywords: *ESL Speaking, Virtual Reality, Rural School*

INTRODUCTION

Language learning has been a staple in classrooms for as long as civilization prospered for its people with the gift of learning. Multiple techniques, processes and reformations have been implemented in the hopes of improving and increasing the quality and scale of education to improve the capabilities of humanity in achieving success and creating innovations. Through the advent of the computer, more and more efficient means of learning have been created and brought upon students to further enhance their learning experience. Czerkawski (2020) pointed out that although current techniques of language learning now negotiate complex realities and continuously changing contexts, the lack of worthwhile activities (activities that engage the students through more interactivity, beyond the usual arsenal of writing on books, reading and

such) that engage pupils beyond vocabulary and grammatical structures has emerged as a problem. An immersive experience is frequently necessary for fluency. Many people find it impractical to travel to a place and speak with locals while they are there. The resources needed to even partake in such a journey proves much for the common person, and it is more common to partake in localized imaginary scenarios to recreate such immersive experiences. As an alternative, the rise in popularity of virtual reality (VR) headsets has propelled the idea of online language instruction into uncharted territory. Inside the space of VR technology, the imagination of an idea could be projected into a second reality, allowing yourself and others to experience that reality all through the viewpoint of a headset. The importance of this is mainly due to the unparalleled immersion VR brings into the table. The use of VR technology in the classroom opens up a world of possibilities for access to experiences that would otherwise be out of reach, for example, a trip to Japan or perhaps the Moon? In conclusion, Loup (2016), and Yang (2010) states that VR technology is considered as one of the emerging and highly promising technologies for learning and training.

According to Enba et al. (2021), everyone should work on developing their speaking and listening skills. This is because it affects almost every aspect of life that relies on communication, including education, employment, and even a person's relationships with those around them. A typical listening or speaking session in Malaysia would commonly include a scenario, which becomes the precedent for students to discuss, and practise their speaking skills based on it. Safranj (2015) claimed that 62% of the participants from their study showed that their sample preferred watching movies. Furthermore, Yurko & Styfanyshyn's (2020) study shows that hearing actual conversations in a foreign language is crucial for language learning. Based on what could be deducted, speaking classes tend to not have versatility in the techniques used to conduct such classes.

What is clear is that a breakthrough in this field is currently required to re-energize the speaking skills classes. This is where VR integration comes into play. Virtual reality, through the integration of virtual spaces paired with physical movement tracking, allows untold materials of various topics and cultures to be immersed while also enabling locals to interact with actual native speakers of Western countries without the need to travel to their location, bringing unparalleled potential in the education space. The reality of classrooms nowadays is that we tend to create learning based on our own experiences and others. But this could be limited in a way that could be repetitive or predictable. Not only is this stagnating, reducing the motivation to even revel in language learning, but it also does not provide stimulation, which further hampers the effort. Therefore, a breakthrough in this field of education is desperately needed, as the coming of advanced technology upon us should be utilised and integrated properly, not just for entertainment but also in improving our education lifestyle, to provide a more quality learning experience. Therefore, this study aims to provide a baseline for future endeavours planning to form a VR implemented classroom for learning English, in which they can see the perception of such technology being utilised in a school environment and determine whether it is worth the risk and effort.

Due to these circumstances, this research proposes two research questions that will be the main focus of this study, which are: -

1. Does Virtual Reality (VR) implementation have any effects on the development of ESL learners' speaking skills?
2. What are the students' perceptions on the usage of VR as a language learning tool?

The researcher believes that the findings of this study will benefit educational institutions, as well as non-profit organizations and individuals in Malaysia, because it promotes a certain level

of understanding on the current perception of students in rural areas regarding the use of VR in their classes. Due to the extensive work, expertise, and funds required to successfully implement such classes, particularly in rural areas, the results can be used as a guideline to indicate the current risk to reward ratio of implementing such classes. Furthermore, the findings of this study could be used as a foundation for developing more cohesive lessons centred on VR experiences, with modifications to meet the needs of the students.

Therefore, this present paper aims to investigate rural secondary school students' perceptions of the use of virtual reality (VR) as an alternative to the traditional classroom setting, specifically in the context of an oral skill lesson. Furthermore, the students' perceptions include general perception, motivation levels, interest, and skill development when exposed to a VR classroom. Further sections of this paper would discuss the procedures employed to obtain data, provide analysis on the data obtained throughout this study, as well as discussions, comments, and recommendations for future research as a conclusion.

LITERATURE REVIEW

Virtual Reality in Education and Related Fields

The first use of VR can be traced back to the 1960s, when Morton Heilig developed the Sensorama, a machine that used multi-sensory feedback to create a sense of immersion in a simulated environment (Biocca, 1997). However, it was not until the 1990s, with the development of more advanced computer graphics and the availability of cheaper, more accessible VR hardware, that VR began to gain widespread attention and adoption (Burdea & Coiffet, 2003). Since then, VR has been used for a variety of purposes, including entertainment (e.g., video games, movies), training (e.g., military, medical), and education (e.g., virtual field trips). It has also been used in therapy and rehabilitation, such as helping individuals with phobias or post-traumatic stress disorder (PTSD) confront their fears in a controlled environment (Gaggioli, Riva, & Wiederhold, 2017).

A study by Elmgaddem (2019) describes the use of VR as a tool for historical education as another illustration. According to the study, using VR to increase students' presence and engagement in historical contexts can help them better comprehend and remember historical events. W. Martin and C. Schifter (2018). This evidently shows that the interactivity, which is one of the main focuses of VR technology, if properly retrofitted for English learning syllabuses, could also improve overall comprehension and learning, especially when referring to areas such as speaking.

Furthermore, based on meta-analysis of VR in education research by McCabe (2018), students who used VR in their instruction were found to perform better on tests of content knowledge compared to students who did not use VR. Moreover, a study by Rau (2019) found that the use of VR in education could improve students' spatial reasoning skills, a key component of STEM education. The integration of VR with instruction and the teacher's role in the VR classroom are noted to be essential for improving student learning. Teachers need to have a solid understanding of the technology and how to use it in their lessons if VR is to be successfully integrated into the classroom. Proper training or a crash course would be needed for instructors who are not too familiar with the technology, as it may have an effect on the overall performance of virtual reality users, especially learners. As a further reinforcement to the previous statement, it is crucial to remember that the quality of the planning and implementation of the technology-based resources determines how well VR works in education. According to a study by Dede (2017), the degree of engagement and interactivity of the VR experience was highly correlated

with the effectiveness of VR in education, with more interactive and engaging experiences leading to better learning outcomes.

Parmaxi (2020) discusses that language teachers have a plethora of options thanks to VR's rapidly developing features. The primary contribution of this study is that it demonstrates the growing potential of VR in language instruction and learning. Future researchers and practitioners should focus on areas like aligning VR features with a strong pedagogical foundation, as per theories and models such as TPACK, or CALL, aligning VR features with learners' strategies, cognitive processes, and practises, researching less-researched abilities like writing, reading, cultural awareness, and critical thinking, and utilising fully immersive, reasonably priced virtual technologies in parallel with English language learning.

Previous Studies on VR Classrooms in Education

The trend, acceptance level, advantages, and challenges associated with the implementation of VR in tertiary education in Malaysia are examined in a paper published in 2020 by Rachel Wong et al. The conclusion of the paper is that VR is still not widely used in Malaysia's higher education. Additionally, it is not significant how widely VR technology is accepted in tertiary education. Despite this, the majority of students believe that incorporating VR into their experiments and practical classes will improve their learning. Last but not least, technical issues and educators lacking strong technical skills due to inexperience are the main obstacles Malaysia's tertiary education faces in implementing VR. Concluding from this study, Even if a large portion of students prefer a new experience in their learning experience, it seems that limited knowledge of such technologies, particularly on the side of the educators, paired with the quite expensive price of equipment to foster such method of education would likely become a main factor in blocking VR technology from ever being implemented in Malaysia.

Chen (2009) states that VR's theoretical limitations in the classroom are rarely discussed. In fact, more fundamental research, such as design-based research that aims to generate theories on virtual reality learning, should be further encouraged in order to enable the effective and proper integration of such technology into an educational setting. However, the recent developments made in VR technology have allowed much easier and more compatible learning capabilities compared to previous iterations of the model, in which VR could be accessed through a variety of headsets specifically designed for the endeavour, and at a lower cost. Although this study was made previously in the context of Malaysian and global education infrastructure, and despite the technological leaps that VR has reached, has not warranted change as of date, with the main culprit possibly being cost-effectiveness, and re-training of teachers in adapting this tech into their pedagogy and syllabus.

METHODOLOGY

This study obtained 39 questionnaire respondents and 10 interviewees at SMK Desa Kencana in Lahad Datu. The questionnaire was distributed in hard copy form, and the interviews were done physically. The participants were purposefully chosen based on the convenience of the population, which is already available in the form of current school students, as well as their availability for the researcher, which in this case would include students from Forms one and two.

This study used a multi-method research design in which both questionnaires and interviews were used to collect the data needed for this research. The interview session was conducted by choosing a total of ten respondents from the questionnaire sample for further qualitative sessions. The questions that were asked of them included *"Did the VR classroom excite*

you / Perception of VR learning in English", as well as *"Do you have any comments about VR implementation in English classes?"*. The answers provided were then analysed using descriptive analysis, while the interviews, through thematic analysis, were used as supporting data to help answer the research questions posed in this study. Each interview session was done in a duration ranging around two to five minutes, and the respondents' answers were written down on the section provided at the back of the questionnaire by the researcher for further analysis.

A number of paraphernalia were incorporated during the portion of this study, among them which would be the inclusion of an Meta Quest 2 Headset, more commonly referred as Head-mounted Displays (HMDs) which would bring the experience of virtual reality into a user. Included with this headset would be a personal computer, used to power the software needed for the VR experience, a projector, to showcase what is being viewed by the user wearing the VR headset to the rest of the class, as well as the lesson plan, which would be needed to conduct the classroom and teach the syllabus. Methods of data collection included in this study would include Likert Scale Questionnaires, and interviewing sessions, to fulfill both quantitative and qualitative needs. During the experiment, incorporating a personal computer and a projector will also be included as supporting peripherals, mainly tasked with showing what students would see in the HMD to the rest of the classroom.

To ensure the validity of this study, an acknowledged lecturer from the Faculty of Psychology and Education at Universiti Malaysia Sabah acknowledged and certified the questionnaire. The questionnaire contains eight items and is derived from Campos's (2022) study, modified to fit this research. This study's reliability is measured using Cronbach's Alpha reliability method and shows a value of 0.687, signifying a moderate level of reliability.

Table 1 Reliability Statistics of the Questionnaire

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.699	.687	8

Data from the qualitative study would be transcribed on paper and documented, analysed through the use of thematic analysis, focusing on keywords and general perspective taken note and deemed as each participants' general view of the VR experience. As for quantitative measures, an analysis through the usage of SPSS version 28.0 would show the significance of VR integration on the overall improvement of speaking sessions, as well the respondents' general perception on the implementation of VR in their English classes.

FINDINGS

Results Analysis

Table 2.0 indicates the overall analysis of the questions present in the questionnaire. Question (1) of the questionnaire inquires the respondents on whether they are familiar with the term "Virtual Reality" (VR) or witnessed and experienced VR technology before this investigation. Table 4.4.1 indicates that the respondents generally agreed on the statement presented by Question 1, showing that they are indeed familiar with the term "Virtual Reality" and its mechanics. The mean value of 2.74, as well as the mode frequency of 3 (Agree) as shown in Figure 4.4.1 is supporting

evidence for this indicator. Therefore, a majority of the respondents are familiar with VR technology prior to this research.

Table 2 Descriptive Statistics of All Questionnaire Data

Statistics

		Question1	Question2	Question3	Question4	Question5	Question6	Question7	Question8
N	Valid	39	39	39	39	39	39	39	39
	Missing	0	0	0	0	0	0	0	0
Mean		2.74	2.79	2.97	3.08	2.92	2.74	2.74	2.85
Std. Deviation		.751	.833	.778	.739	.984	.910	.966	.904

Question (2) deals with whether the VR learning experience is consistent with the teaching method that is desirable for the respondents in an English learning classroom. The mean value of the analysis, which indicates a value of 2.79 shows that a majority of respondents agree with the question, with 23 (59%) respondents agreeing while 6 (15.4%) strongly agreeing. 10 respondents (25.7%) however disagreed or heavily disagreed with the statement, likely showing that they prefer a more traditional classroom as opposed to VR learning. This concludes that many prefer VR learning over the traditional method of learning.

The analysis for question (3) shows that 19 (48.7%) of the respondents agreed that implementation of VR technology would be able to inspire them to learn better. A further 10 (25.6%) respondents strongly agreed on the question. In contrast, 9 (23.1%) respondents disagree on this statement, while one (2.6%) respondent heavily disagreed. The mean value of this range sits at 2.97, the second highest of the eight questions presented in the questionnaire, which shows that many respondents agreed with this question.

The analysis for question (4) shows that a large majority of the respondents agree on the question in which VR technology could improve the quality of speaking lessons in English. This is indicated by the total of respondents that agreed and heavily agreed, totalling to 32 (82%) of the total respondent count. In addition, the mean value for this question is the highest, sitting at 3.08, which concludes that most respondents resonate with this question.

Analysis for question (5) asks the respondents whether they would prefer VR-centred classes over traditional classes. Based on the data obtained from the questionnaire, as well as from Table 4.4.5, it is shown that 11 (28.2%) of the respondents as well as 3 (7.7%) of the respondents disagreed with this statement, opting to stay in traditional classes. A number of 11 (28.2%) respondents have shown that they somewhat preferred VR classes over traditional ones while a further 14 (35.9%) respondents heavily favour VR classes. Therefore, this graph shows that at least two-thirds of the respondents' view VR classes as superior to the standard traditional ones, and prefer them more in learning.

Question (6) asks the respondents about their thoughts on whether VR implementation could allow them to retain more information compared to a traditional learning experience. This is in the context of speaking skills, in which students primarily delved in when they were experiencing their VR learning classroom. After their learning session was over, it is seen through this data that 10 respondents disagreed, while 4 strongly disagreed, making up a total percentage of 35.9% of the total respondents. The rest of the respondents generally favour this statement, shown by the total of respondents that agreed with the statement amounting to 25 respondents (64.1%).

Question (7) asks the respondents whether VR learning helps them concentrate in class. This is in the context in which they were conducting speaking classes. Based on the data, 19

(48.7%) respondents agreed with the statement, while an additional eight respondents (20.5%) strongly agreed. Six respondents disagreed and heavily disagreed respectively amounting to 30.8% of the total respondent count. Therefore, it is sufficient to say that at least two-thirds of the respondents feel that they can do better in speaking classes when they utilise VR technology.

Finally, for question (8), respondents were inquired whether their understanding of the lesson (speaking lessons) improved when the utilisation of VR was present. Out of the 39 respondents, 26 (66.6%) agreed with this statement. 13 (33.3%) respondents generally disagreed with this question, which shows that their opinion on whether VR technology could improve their speaking experience is met with no enthusiasm.

Based on the majority of the statements given by the interviewees (10 Students), The general view on the implementation of VR in Oral English Classes were met with quite the positive review. Interviewees had a positive experience during the VR class, especially since it was a new experience for the students. Their exposure to VR classes also brought with them some comments about the implementation of VR, which included both positive and negative reviews.

> *"The graphics could really use improvement cause it hurts my eyes. Education wise, it's a bit hard to learn when using VR because it's more towards playing games in my opinion. Additionally, the sound is a bit underwhelming."*
>
> *"The utilisation of VR is innovative, interactive. Would be nice to learn science based English using it."*
>
> *"I'm a bit intimidated because of health reasons. But it's nice having a new experience."*
>
> *"VR is, in my opinion, more geared towards playing games than learning, It can be challenging to learn. The sound is also a little lacklustre."*

For instance, one of the interviewees stated that the VR classes are innovative and interactive, which could be a strong point in increasing motivation and attention retention during English classes. In addition, the use of gamification using VR shows that the fun factor in English classes could be increased. However, Interviewees also stated that VR classes have their negatives. For example, they stated that the VR application's quality needs to be improved, in terms of graphical fidelity and sound quality. In addition, health issues are an important factor in VR classes, as some have concerns about the side effects of using VR. Furthermore, some interviewees think VR classes could lead to more play time than learning.

DISCUSSION

Based on the findings of the research, we will now discuss the related aspects of the research questions and correlate them with the findings concluded by the data obtained in this research. For the research questions, an emphasis was put on the improvement of speaking skills (Oral Skills) through the implementation of VR. Oral skills generally have less methods of innovation due to their nature that emphasises on verbal interaction, which would be advantageous in a media-oriented setting. However, the current standard of using audiovisual media has become stale through the years as students are getting used to the technology, not only in a school setting but also in their own time.

The introduction of VR not only brings a new experience for the students to indulge in, but the emphasis is placed on their increased motivation levels as they try new things. With that increased interest translated to a learning experience, it is possible that students can actually learn, and improve their skills as they continue diving into that new experience, and therefore could potentially improve their oral skills as a result. Klimova (2021), stated that the integration of VR could bring benefits to the typical classroom, which could be the case considering the results of the data obtained. higher motivation is present for several respondents regarding attending and learning English classes, as well as indulging in oral learning.

Does Virtual Reality (VR) implementation have any effects on the development of ESL learners' speaking skills?

It could be noted that their increased development in the speaking skills to be beneficial and present assuming the right circumstances. Although the data obtained does not explicitly show the improvement of the ESL learners, it is noted that their increased motivation and interest in oral learning could be a main factor in driving their increased performance, as noted by Elmgaddem's (2019) study, which claimed that the use of VR helped engagement among students in history. Therefore, it could be concluded that the implementation of VR does indeed contain a positive effect on the development of ESL learners' speaking skills.

What are the students' perceptions on the usage of VR as a language learning tool?

It is implied that, because of the nature of the study being conducted in a rural secondary school, the researcher initially assumed that the introduction of VR technology would be met with critically positive review. However, after analysis of the data obtained, it is shown that not all students have that opinion. Some deemed that the introduction of VR classes would cause their learning experiences to become an experience in which they play, rather than learn. In addition to such issues, the concern in health issues, stemming from the fact that side effects such as seizure and nausea could occur during the process of learning, is not that attractive, among other things such as disappointing quality in terms of graphical fidelity and sound quality. Regardless of these factors, the data obtained by respondents show that the majority are content and enjoyed the implementation of VR in their classroom.

Overall, the perception of the implementation of VR in oral speaking classrooms in English would be met initially with positive reviews. However, the implementation must abide by the standards set by traditional classes, providing lessons in range with the students' expectations and requirements to improve them. Otherwise, such efforts would only be a waste of time for educators and students. Through this research, educators in Malaysia could get a small grasp of the general perception of students, particularly located in very rural parts of Malaysia, and set their benchmark on the prospects of implementing a VR classroom, or hub in such places. This study could act as a reference for the ministry, NGO's or individuals who are keen on going forward with such an endeavour. In addition, this research could also guide learners on ways to conduct VR classes in both urban and rural areas and provide them with expectations that they might face when they will conduct such classes in schools all over Malaysia.

In conclusion, the results of the data show that the general perception of the respondents towards the implementation of VR is generally positive. Interactivity, innovation, as well as new experiences were among the main factors that contributed to the positive reaction of the respondents towards the VR classroom. In terms of their plausibility in improving the quality of speaking classes in English, a majority of the respondents have noted that such an endeavour was possible, however should be conducted in the right circumstances, as issues such as low

graphical fidelity, mediocre sound quality, health issues and the potential for a classroom to not conduct a lesson but instead opt to play around is possible.

LIMITATIONS OF THE STUDY

It is important to acknowledge some of the research's limitations. The data gathered for this study cannot represent a population due to time restrictions. In addition, the sample size is too small to represent even the population of the school itself, that being the students of SMK Desa Kencana. The data findings could only prove that the general perception of the respondents involved in this research show positive feedback in regard to classes with VR. In addition, the findings for Research Question 1 (RQ1) is somewhat unsatisfactory, due to the time constraints and difficulty in conducting a more expansive research such as this in a rural area, as well as the obstacles in conducting such a research that requires other equipment, as well as the need to cash out funds in order for the research to succeed.

Furthermore, to better determine the effectiveness of VR implementation in the effort to improve oral skills among students, a study with a control group and an experimental group is highly recommended to see the actual influence VR has on the rate of improvement among students, particularly in speaking skills. In light of this, it is clear that such a project would necessitate a significant amount of funding, as using only a single headset for a larger sample size would be too time consuming, especially when conducted in an environment that does not facilitate an easy experience when conducting such a research, such as that found in rural areas where SMK Desa Kencana is located.

Implication of the Research

Through this research, educators in Malaysia could get a small grasp of the general perception of students, particularly located in very rural parts of Malaysia, and set their benchmark on the prospects of implementing a VR classroom, or hub in such places. This study could act as a reference for the ministry, NGO's or individuals who are keen on going forward with such an endeavour. In addition, this research could also guide learners on ways to conduct VR classes in both urban and rural areas and provide them with expectations that they might face when they will conduct such classes in schools all over Malaysia. This study is particularly unique. in which it is research placed in a location and environment that is less likely to be conducted. The nature of this study serves as further reference for those who are inclined towards conducting similar research in areas that are less common for consideration, due to distance and convenience, while also fulfilling a niche that is currently underexplored in this country.

CONCLUSION

Ultimately, the purpose of this research is to look into rural secondary school students' perceptions of the use of virtual reality (VR) as an alternative to the traditional classroom setting, specifically in the context of a speaking skill lesson. Furthermore, when exposed to a VR classroom, students' perceptions include general perception, motivation levels, interest, and skill development, as well as their effects on the aforementioned aspects. In general, both research goals in this study were met, and further studies in this topic is highly recommended as the researcher believes that the implementation of VR, IR or AR is the next step towards improving the quality and experience of education worldwide. Finally, this study believes that implementing VR would be able to increase

the motivation, interest, and skill development of ESL learners, particularly in speaking skills, and thus investigate whether VR classrooms appear to be a better alternative to our current learning environment.

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The Employment of Multimedia Elements in Classroom Teaching Among TESL Teacher-Trainees In University Malaysia Sabah

Amanda Hollygrace Peter[1] and Wardatul Akmam Din[2]

[12]Faculty of Psychology and Education, Universiti Malaysia Sabah
amandahgpeter99@gmail.com & wardadin@ums.edu.my
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ABSTRACT

The employment of multimedia in classroom teaching has pushed education into one step higher from the conventional approach teaching method to more participatory and exciting teaching and learning process. The purpose of this research is to explore the degree to which multimedia is used in classroom instruction among TESL teacher-trainees during the practical teaching. A total of 37 respondents comprising of fourth year TESL teacher-trainees from University Malaysia Sabah participated. This study also aims to find out whether or not the TESL teacher-trainees integrate multimedia in classroom teaching and if they do, the study aims to identify the multimedia elements they frequently use and if not, the study wants to find out the reasons for not integrating multimedia in their classroom teaching. As a result, it was observed that even among those that integrate multimedia, there are limitation to using multimedia in the classroom activity. Furthermore, the advantages stemming from the integration of multimedia have also been discovered. The result of the data analysis revealed three major findings namely the forms of multimedia incorporated in classroom teaching by TESL teacher-trainees, the benefits of the integrating multimedia in the classroom and the limitations. Based on the results, numerous discussions and suggestions are formed in order to enhance the incorporation of multimedia in classroom education

Keywords: *multimedia, integration of multimedia, TESL teacher-trainees*

INTRODUCTION

As a global language, English has considerable clout in many parts of the globe. In Malaysia, all students are required to study the English language. The goal is to improve students' ability to use English for both social and professional purposes. Students should be proficient in the use of English for a variety of tasks, including asking questions, reading and understanding course materials, and producing written work. As a result, teaching children to listen attentively, read critically, comprehend elaborately, communicate articulately, and write well is a priority. Therefore, students need to acquire not only pronunciation and language abilities but also grammar, as it is regarded as a crucial aspect in studying English, to accomplish these aims. Implementing technology in education as an extra instrument to increase language learning and competence and to equip students with crucial skills is not a simple undertaking in the twenty-first century. Another example of a difficulty our society and government are facing in our

educational system is preparing for globalisation, information, and communication revolution in a growing nation. The computer and other forms of multimedia technology have proven to be useful tools in classrooms throughout the globe. However, owing to inadequate infrastructure and the high cost of access, the usage of technology is still in its infant stage in the Malaysian school system. When compared to other countries, firms in Malaysia are very slow to adopt new technologies. For a long time, schools have been running with inadequate supplies. Back then, schoolbooks and teachers' expertise were the only reliable resources for learning a topic. Even though they often provide out-of-date material, textbooks serve a crucial function throughout this period. Furthermore, the 2 teachers are the sole credible authority on the subject matter. This demonstrates how far behind other emerging countries we are.

Therefore, this present paper aims to investigate the type of multimedia integration in classroom activities, to discover the benefit of integrating multimedia in classroom activity and to recognize the limitation of integrating multimedia in classroom activity. To fulfill these aims, a research question/research questions needs to be addressed:

i. Does the integration of multimedia motivate students to engage in classroom activity?
ii. How does the implementation of multimedia promote interest within students.

LITERATURE REVIEW

The effect of using multimedia on students' performance

According to Dwyer, students may get knowledge and information that would be hard to obtain in conventional methods and the possibility to develop their own goods using multimedia techniques (1993). As a consequence, it may be argued that the usage of multimedia has the goal of assisting students with varying talents and learning styles. Furthermore, Dwyer emphasizes that multimedia allows students to work independently. In other words, a student may work on a task that she or he feels she or he needs to in the manner that she or he wishes (Dwyer, 1993). Furthermore, multimedia increases the authenticity and diversity of learning and education. According to Semerci (1999), the message through multimedia reaches the recipients in a variety of ways, providing a richer learning environment. The concepts being taught might be transferred to students via web-based audio, images, video, and animations in ways that traditional methodologies could not genuinely teach in classrooms. Closeness to reality and total learning might be obtained in this manner (Semerci, 1999). Furthermore, multimedia facilitates education in terms of data use, storage, sharing, and transit of visual and 8 nonvisual textual material, graphs, audios, and other resources. Compared to conventional teaching and learning approach, multimedia usage improves students' academic success. When appropriately planned, the usage of multimedia has a significant impact on education in terms of academic attainment compared to conventional teaching (Akkoyunlu and Ylmaz, 2005).

The use of multimedia in an educational setting

According to Almara'beh, Amer & Suleiman (2015), traditionally, the encyclopedia, which is normally accessible at the library, would be the major source of knowledge for student and they would gather numerous textual resources on a CD-ROM with access to interactive multimedia. For context, in the medical field, the student may replicate a diagram showing the skeleton and muscle structure of the subject they are learning. Using multimedia approach, the student may include video snippets of these creatures in their native environment into a report. The student now has a fresh and unique means of presenting his or her own unique viewpoint by adding titles

and credits. Similarly, a university lecturer utilize multimedia to prepare or update content or to teach in order to elevate his/her teaching, therefore unconsciously boosting the quality of the course. Furthermore, to an extent, through the use of multimedia,

Multimedia in classroom

The world around us is changing as a result of technological advancements. The academic environment is no different. Students and instructors worldwide are finding new and interesting methods to make learning more dynamic and relevant to the technological advance world. Table 1 displays the examples of multimedia and its benefit if incorporate it into the existing curriculum.

Table 1 Benefits of Multimedia

Multimedia	Benefits
Video Report	Encourage teamwork and give hands-on experience with new technologies.
Video Language Lessons	Can aid to accelerate learning
Slideshow Presentation	They are used for nearly any topic and are simple to make using multiple editing software such as Canva and Slides Go.
Podcasting	A communication technology that allows anybody to generate audio files and upload them on the internet for others to download.
Convert lessons to MP3	Students are permitted to listen to content more than once.

The extent of the employment of multimedia in classroom teaching

According to Puteh & Shukor (2010), they have investigated the extent of the integration of multimedia elements in classroom teaching among TESL teacher-trainees during their practical teaching. Based on their results, according to the findings, even we try to integrate multimedia, there are limits to including it in classroom instruction, which this research has uncovered. Aside from that, the advantages of incorporating multimedia have been established. The data analysis resulted in three major findings: the types of multimedia incorporated in classroom teaching by TESL teacher-trainees, the benefits of integrating multimedia in the classroom and the limitations.

Several implications and suggestions are taken from the data to enhance the inclusion of multimedia in classroom education. According to the research, there are several benefits to incorporating multimedia into classroom instruction. For starters, responders discovered that including multimedia in the class motivates kids to learn. Furthermore, the use of multimedia components such as video, animation, graphics, text, and music may make the course more engaging and interesting to students. This indirectly draws students' attention while also aiding their understanding of the material. Furthermore, since the incorporation of multimedia activates and stimulates the memory process, pupils can remember the information presented. Furthermore, the respondents discovered that students engaged actively in the classroom since multimedia activities reduced their anxiety levels. Furthermore, pupils were able to readily complete the activities. This demonstrates that incorporating multimedia into classroom instruction improves knowledge of a subject. 11 According to the results, certain evident barriers are preventing TESL teacher-trainees from completely incorporating multimedia into their classroom instruction. For starters, most of the schools where they practised teaching did not have a computer in the classroom. As a result, they must utilize the multimedia room or language

lab to include multimedia into the lecture. However, although some schools have a language lab or multimedia room, it is not always enough for the usage of the students.

The usage of the multimedia room and the language lab is probably restricted since other classes may use the classroom also. Furthermore, the research titled "Multimedia in the classroom-reality or fantasy" by Abdullah, Hatharan and Ibrahim (2021) has found that some of the experimental group in their research preferred multimedia courseware beneficial compared to conventional teaching approach. Any educator interested in designing and implementing multimedia courseware must examine several aspects. Converting printed text to electronic display involves some imagination, intelligence, and time-consuming preparation. A courseware developer must have the technical knowledge to properly use the possibilities of multimedia authoring tools.

Knowledge of instructional concerns such as the volume and appropriateness of content, layout design, images, background music, user interface, and so on is required. Another critical issue that must be considered is the degree of learner autonomy mandated by the programme. The collaboration model, in which a team of content specialists and technology experts collaborates, is more practical for practicing instructors since the effort can be distributed among team members. When working in a team, however, 12 certain concerns must be made, such as the coordination and synchronization of the transformational and development processes. Additionally, resources (reference material, hardware, software, funding) that will aid in the smooth progression of the courseware creation stage must be made accessible. To effectively integrate the courseware into regular classes, a well-thought-out methodology (allocating acceptable and adequate watching time, ensuring that the viewing time fits the classroom lesson/schedule) must be developed during the implementation stage.

Other factors to consider include the student-computer ratio, access mode (self-access or assigned), and built-in mechanisms such as awarding participation marks, using the courseware as part of an assignment, and conducting a short evaluation after the viewing to ensure that students attend the viewing. To summarize, most educators and educational institutions are still unable to employ in-house generated multimedia courseware in the classroom.

METHODOLOGY

This study adopted mixed methods, incorporating qualitative and quantitative methods of study to fulfil the objectives. The data obtained from this study would then be analysed in the pursuit of gaining clarification of the research question. The main objective is to see if the TESL teacher-trainees employ multimedia elements in classroom teaching and to re-educate and motivate the integration of multimedia in classroom activity among them.

The research was conducted as an experiment in which the researcher tried to employ multimedia elements in an ESL classroom. This experimental research helped the researcher answer questions about whether the TESL teacher-trainees integrate multimedia elements in teaching classroom teaching, enhancing students' performance and understanding. The design was mixed-method which consisted of qualitative and quantitative, and the data was analyzed statistically. This allowed the researcher to know the employment of multimedia elements in classroom teaching. This experiment took four months to be conducted. A control group design was used in this study. The sampling was chosen randomly to test independent variables.

The population of this research was the TESL teacher-trainees of the University Malaysia Sabah which consists of 37 teacher-trainees. There is only one instrument used in this research, that is questionnaire. The questionnaire was designed to investigate the forms of multimedia

integration in classroom activities. The questionnaire was given only to the TESL teacher-trainees going to practicum. The would-be Part A, which consists of the respondent's personal information. The information includes their gender, age, name of school they are doing their practicum at and how many class they are teaching. As for Part B, which is the qualitative method that is a series of few questions that includes what are the benefits of integrating multimedia elements in classroom teaching, the limitation of using multimedia in classroom activity, and the reasons of not integrating multimedia in classroom activity. The validity of the questionnaire and interview questions was evaluated to verify that they could adequately address the study issues. Cronbach's Alpha was also used to determine the questionnaire's reliability coefficient.

This research was conducted by giving the experimental group the questionnaire on the week 14 which is near the end of their practicum, this is because the TESL teacher-trainee can do provide a reflective answer towards the research on what they have implement throughout their teaching practice. The questionnaire's data will be collected and analyses using Statistical Package for The Social Science (SPSS) and thematic analysis.

FINDINGS AND DISCUSSION

The overall aim of the study was to investigate the forms of multimedia integration, to determine the benefit of integrating multimedia, to identify the limitation of integrating multimedia and the reasons of not integrating multimedia in classroom activity. The questionnaire comprised of 2 sections with a total of 4 personal information of the respondent, 1 closed-ended question and 6 open-ended questions that were developed to ensure rigour and objectivity of data. This study was conducted among 37 TESL final year trainee teaching of University Malaysia Sabah, Kota Kinabalu. Overall, 36 respondents answered the questionnaire as in Table 2.

Table 2 Gender of Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	28	71.8	80.0	80.0
	Male	7	17.9	20.0	100.0
	Total	35	89.7	100.0	

There was a total of 28 female participants, which represented 71.8% of the quantitative data while there were only 7 male participants which is 17.9%. All of the respondents are also participants in the qualitative data.

According to Table 3, the majority of the respondents are at the age of 24 (53.8%), followed by 23 years old which stands at 23.1%. This study also consists of 4 respondents at the age of 24(10.3%) and only 1 respondent that is 26 years old (2.6%).

Table 3 Age of Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	23	9	23.1	25.7	25.7
	24	21	53.8	60.0	85.7
	25	4	10.3	11.4	97.1
	26	1	2.6	2.9	100.0
	Total	35	89.7	100.0	

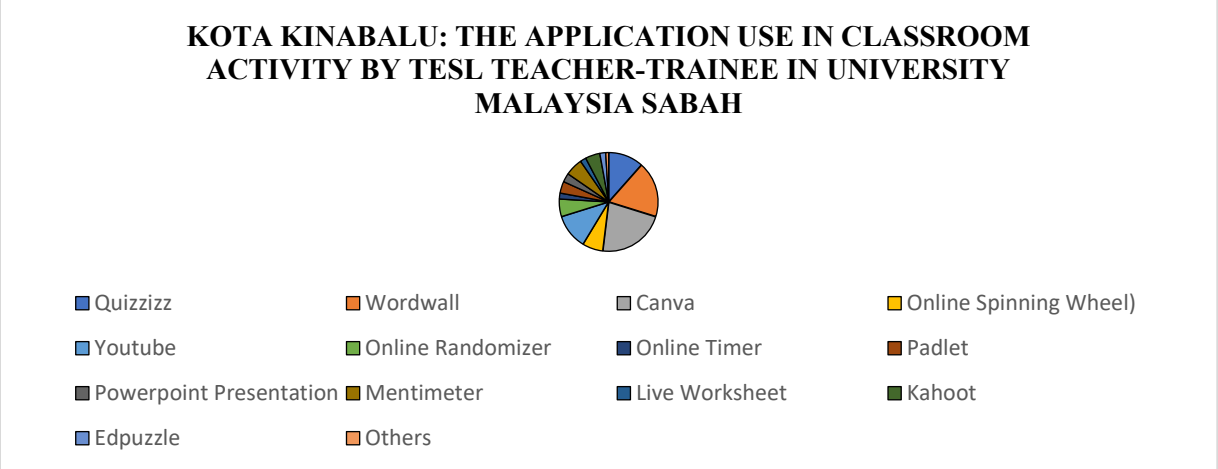
Table 4 The Integration of Multimedia Elements

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	35	89.7	100.0	100.0
Missing	System	4	10.3		
Total		39	100.0		

According to Table 4 above, it is a clear indication that all the respondent answer "YES" for whether or not they integrate multimedia elements in their classroom activity. The total of respondents answer "YES" is a total of 35 respondents and 0 respondents answer 'NO". The responses from the respondent on the benefits of integrating multimedia elements in classroom teaching and learning process gives a clear indication that indeed integrating multimedia in classroom activity, promotes interest within student which enhance the engagement of the classroom activity.

Based on the research results, the application that the trainee-teacher used is as follows in Figure 1.

Figure 1 Application used in classrrom



As we can see, the highest number belongs to the application of Canva with 23 respondents using this application, following that is Wordwall with 19 respondents, both Quizzizz and Youtube have a tie in terms of the number of users using this application that is 12 respondents. Other application such as Google Classroom, Voki, Google Slides, Live Worksheet and others have been a choice to some of the respondents. The students are more interested in learning than when they are being taught conventionally. This is because when a respondent showed Canva slideshow, they were engaged, and it is easier the teacher to explain the lesson topic rather than rewriting the lesson notes on the whiteboard. With that being said, the researcher believed the reason that Canva became a choice to TESL teacher-trainees is because the interface of the application/software is user-friendly, and it makes slideshows, video, posters, and pictures easier to produce.

Furthermore, as an overall theme for the research question is that the integration of multimedia indeed motivates students to engage in classroom activity as well as promote their interest in participating in the classroom activity. Therefore, referring to the research result, most respondents agree that the lesson becomes more interesting when multimedia elements are implemented in the activity. Multimedia facilitates classroom activity and content which makes the lesson fun, interactive and students are able to engage actively due to the fact that they are excited to play the game created from applications such as Wordwall or Mentimeter. Through the use of multimedia in terms of gamification, it increases classroom participation as students are excited to engage in the activity which allows them to explore the lesson themselves. Other than that, the visuals such as the graphics, pictures or videos display through Powerpoint Slideshows, Youtube or Kahoot aid students to learn better especially with lower proficiency. The use if the elements sparks both the teacher and the students' creativity especially when it comes to productive skills such as speaking and writing activity, the elements are usually being presented in the forms of prompts to direct students' way of thinking.

Not only that, when multimedia elements are included in the lesson, students' attention retention are expand as the student are attracted to audio-visual elements of the multimedia, since students are prone to become unmotivated in traditional classroom setting when the teacher uses only textbook. Therefore, with the help of creative elements, the students will be attracted to the information presented and stay focused. Example, teacher uses Youtube to show a video about a topic, students unconsciously are drawn towards the audio and visual of the video, with that, students' attention are focus to the content of the 26 video which increase the students' knowledge retention because student have a better understanding of a certain topic. Moreover, multimedia elements assist students' comprehension on the topic discussed. There are different types of learners in a classroom, some are visual learners while some adore competition, hence the use of multimedia elements enables the students to access different styles of learning and continue to discover their strengths as a language learner.

The Education Ministry of Malaysia introduce 21st Century Learning approach in 2017, which focuses on the use of technological advancement and a approach to student-centered learning in the classroom. Therefore, in this era, the integration of multimedia elements using different software, gadgets and applications are crucial in helping the students to achieve their academic potential.

IMPLICATION OF THE STUDY

The employment of multimedia elements in classroom teaching has a significant role in the education system especially working towards a 21st century learning approach, Hence, through this research, the sample, fourth year TESL teacher-trainee can have a better understanding of

the importance of integrating multimedia elements in classroom activity. The researcher believe that the conducted research could be a resource of reference to educator or school administrative because the research can contribute to a point of view of the local school on how effective the integration of multimedia can affect students' academic performances especially the engagement and motivate students to learn efficiently.

Additionally, this research could guide both teacher and student to increase the employment of multimedia in classroom activity. By incorporating elements of multimedia such as videos, pictures and audio, students' attention retention span which can lead to a student-centered learning because student is focus in learning from the video or PowerPoint slides the teacher are showing in class and through that, students are able to be in control of what they are learning. Therefore, teachers or educators are advised to conduct a multimedia integrated classroom environment to ensure students can learn effectively and efficiently.

CONCLUSION

In conclusion, the integration of multimedia technology in education has brought about a significant paradigm change, which will influence our educational system and the pedagogical approaches employed by teachers, as well as the learning experiences of students. The available data strongly suggests that digital teaching and learning will experience significant growth inside Malaysian higher education institutions. Additionally, it is anticipated that multimedia will emerge as a very effective platform for instructional purposes within the classroom setting. The advent of multimedia technologies in the educational sphere and the emergence of a technologically adept generation of youngsters have led to an unavoidable transformation in the function of teaching and learning. The interchange of information is taking place through digital means, and the educational curriculum is undergoing changes to integrate multimedia components and interactive functionalities, thereby enhancing the educational experience for both students and teachers.

The current trajectory in educational approach and strategy is moving towards the incorporation of technology within the 36-classroom setting. Hence, inside this context, multimedia can serve as a strategic instructional medium inside our education system and facilitate the process of teaching and learning. The integration of multimedia in educational settings has gained widespread popularity worldwide, including among teacher-trainees, where numerous educators have adopted multimedia as part of their academic programmes.

The integration of information and communication technologies (ICT) and multimedia technologies within the realm of education holds the potential to cultivate a workforce that is more equipped to address the demands of the contemporary IT society in the 21st century.

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The Impact of Implementing Quizizz on Developing Vocabulary Skills in Language Learning Among Malaysian Secondary School Students in Rural Areas

Salome Stephenia Nordin[1] and Suyansah bin Swanto[2]

[12]Faculty of Psychology and Education, Universiti Malaysia Sabah
Salomejoyme98@gmail.com & suyansah@ums.edu.my
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ABSTRACT

Gamification of education Technology definitely plays a significant part in English Language Teaching (ELT). Nowadays, Quizizz is one of the popular game-based learning that is frequently applied in education especially in language learning lesson. This study investigates the impact of implementing Quizizz, a gamified online learning platform, on the development of vocabulary skills among Malaysian Secondary School Students in rural areas. The current study comprised 33 participants, all of them were from three secondary students with mixed ability proficiency from SMK Desa Kencana in Lahad Datu. Pre- and post-test assessments measure the development of vocabulary skills. The study aims to determine whether Quizizz have a significant positive impact to the development of the students' vocabulary skills. Additionally, students' perceptions of Quizizz as a learning tool are explored through quantitative data using questionnaire. The results of the paired t-test analysis and the difference in mean scores suggested a significant rise in students' vocabulary achievement. Furthermore, according to the questionnaire findings, pupils have a positive perception towards the implementation of Quizizz in language learning. The findings contribute insight into the potential benefits and limitations of applying Quizizz for vocabulary skill development, providing insights into the practicality of utilising technology-enhanced learning approaches in rural education situations. Overall, the findings of this study have significance for educators, policymakers, and curriculum designers looking for new ways to improve language learning outcomes in rural secondary schools.

Keywords: *Quizizz, Game-based Learning, Vocabulary, Language acquisition, rural areas*

INTRODUCTION

The development of technology in education, especially in Malaysia is growing in line with the flow of time and yet it provides benefits and has a large impact on the world of education. Gamification of education technology definitely plays a significant part in English Language Teaching (ELT). Students in the 21st century certainly have a keen interest in technology; thus, we as English language teachers need to keep up with this as well. Nowadays, Quizizz is one of the popular game-based learning that is frequently applied in education, especially in language learning lessons. It is an interactive online game for teaching and learning. The implementation of Quizizz in English lessons is mostly to make students engage and participate actively in the

lesson. Basuki and Hidayati (2019) stated that Quizizz is easy to use and as a fun multiplayer game platform. Quizizz aims to create a more energetic classroom atmosphere, so that the classroom atmosphere is not boring for students. Meanwhile, Ika Dhamayanti (2021) state that Quizizz is an application that is used as an e-learning medium to support the learning process in an English e-classroom. This shows that Quizizz is the right e-learning media that can be used in English e-classrooms and can increase the motivation of EFL students during e-learning. The traditional language classroom is distinguished by directed demonstration, with the goal of memorising or recalling facts rather than conceptual understanding. Traditional classroom mainly relies on textbooks, more emphasis on basic skills and mainly used teacher-centered teaching and learning approach. According to Gulek and Demirtas (2005), there is strong evidence that using technology as an instructional tool in the classroom improves student learning and educational performance. Positive perceptions towards games are expected in the game environment when applied to game-based learning. Teachers can utilise a variety of online evaluation tools in English teaching and learning. They are known by the names Kahoot, Quipper, and Quizizz.

According to Bakhsh (2016), vocabulary is essential for learning any language. Students can read and understand a reading passage in their textbook using these vocabulary words. However, it was apparent that the students were demotivated and unable to recall the meanings and spellings of the words they had learned. Even though acquiring vocabulary is vital, many ESL students struggle with it. Learning vocabulary is commonly perceived as difficult by language learners because some have difficulty grasping the meanings of new words, pronouncing them correctly, applying them correctly, spelling them correctly, and memorising them(Afzal, 2019; Masoud and Ibrahim, 2017). Some teachers continue to use traditional methods of teaching vocabulary, such as rote memorisation, drilling, and chalk-and-talk (Afzal, 2019; Mohamad et al., 2018). According to Mohamad et al. (2018), many teacher-centered practises are no longer relevant to today's learners. Learners frequently require an environment that meets their particular requirements and expectations while also motivating and stimulating them to participate in vocabulary acquisition activities (Jung & Graf, 2008). As a result, teachers should look for teaching approaches that enable students to learn vocabulary in a pleasant and relevant way. It is exemplary for learners to build their own personal vocabulary acquisition strategies in order to become independent language learners (Darmawan & Undang, 2020). The incorporation of Quizizz, an interactive internet platform, with English teaching is one such strategy. Quizizz provides gamified quizzes and instant feedback, which may engage students in active learning and promote vocabulary expansion. However, the effectiveness of Quizizz in increasing vocabulary development among Malaysian secondary school students has received little attention. Addressing this issue is important for teaching practises as well as educational policies. Quizizz implementation that is effective might improve vocabulary developing by providing an exciting and personalised learning experience. Games could assist students in memorising and using new vocabulary efficiently. Learning vocabulary through games, according to Chirandon, Laohawiriyanon, and Rakthong (2010), could provide opportunities for target language practise, motivate students to communicate using all four language skills, and create an actual setting for utilising language.

Therefore, this present paper aims to investigate the impact of implementing Quizizz in rural schools the impact of Quizizz being implemented on developing vocabulary skills among Malaysian secondary school students in a rural area and examine the students' perceptions on the implementation of Quizizz in English lessons. To fulfill these aims, a research question/research questions needs to be addressed:

i. To investigate the impact of Quizizz being implemented in English lessons in enhancing the students' vocabulary.
ii. To examine the students' perceptions on the implementation of Quizizz in English lessons on developing vocabulary.

LITERATURE REVIEW

Vygotsky - Zone Proximal Development (ZPD) and Scaffolding

According to Vygotsky, game enables the child to achieve "beyond his/her average age, above his/her everyday behavior; in game, it is as if he/she were a head higher" (p. 103). Quizizz can be tailored to fit within students' ZPDs by offering quizzes that align with their current language proficiency level. Quizzes should present vocabulary and language challenges that are slightly more advanced than what students can accomplish independently. This ensures an appropriate level of difficulty that encourages engagement and learning without overwhelming students. Vygotsky's theory posits that skills developed within the ZPD can eventually be internalized and performed independently. Similarly, game-based learning can lead to the internalization of acquired knowledge and skills. As learners progress through the game and overcome challenges, they absorb vocabulary, problem-solving strategies, and critical thinking skills that can be applied beyond the game environment. Scaffolding is the process through which a more knowledgeable person provides support, guidance, and structure to a learner within their ZPD. This support can take various forms, such as asking leading questions, providing hints, or breaking down complex tasks into smaller steps. The goal is to gradually reduce the level of support as the learner becomes more capable. A critical aspect in game-based learning is the provision of appropriate aid, feedback, and hint systems to assist students in their learning experience (Fisch, 2005).

Stephen Krashen's Input Hypothesis

Stephen Krashen's theory of second language acquisition, often known as the Input Hypothesis or the Input Hypothesis Model, incorporates the concept of vocabulary acquisition into a larger framework. Krashen's theory is made up of numerous interconnected hypotheses, the "Comprehensible Input Hypothesis" being the one that addresses language development directly. Krashen's Input Hypothesis posits that language acquisition occurs most effectively when learners are exposed to language input that is slightly beyond their current proficiency level. This comprehensible input should be engaging and meaningful, leading to the gradual internalization of language structures and vocabulary. This can be correlated with the student's vocabulary skills with the implementation of Quizizz in English lessons. Krashen's theory emphasizes the importance of comprehensible input for language acquisition. In Quizizz, questions and prompts can be designed to provide context-rich input. Questions should be phrased in a way that learners can understand, allowing them to absorb new vocabulary and language structures in meaningful contexts.

Technological Pedagogical Content Knowledge (TPACK) Model

The term "Technological Pedagogical Content Knowledge" (TPCK) in Figure 1 was introduced in educational studies as a theoretical framework for comprehending teacher knowledge needed for effective technology integration (Mishra & Koehler, 2006). Shulman's Pedagogical Content Knowledge (PCK) model is extended by the TPACK framework to include technical knowledge integrated within content and pedagogical knowledge. There are seven components of TPACK framework in Table 1. They are defined as:

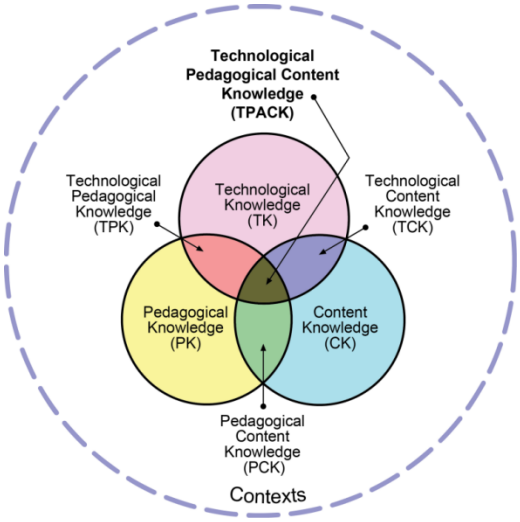

Figure 1 The Components of the TPACK framework (adapted from Mishra & Koehler, 2006).

Table 1 The Components of the TPACK framework

COMPONENT	EXPLANATION
Technology knowledge (TK)	Knowledge of various technologies, ranging from low-tech technologies such as paper and pencil to digital technologies such as the Internet, digital video, interactive whiteboards, and software programmes, is referred to as technology knowledge.
Content knowledge (CK)	"Knowledge regarding real subject matter that is to be learnt or taught" (Mishra & Koehler, 2006, p. 1026) is what content knowledge is. Teachers must understand the topic they will teach and how the basis of knowledge differs between curriculum areas.
Pedagogical knowledge (PD)	Pedagogical knowledge refers to teaching techniques and procedures, such as classroom management, assessment, lesson plan design, and student learning.
Pedagogical content knowledge (PCK)	Knowledge of the teaching process is referred to as pedagogical content knowledge (Shulman, 1986). Pedagogical content knowledge varies by subject area since it combines both material and pedagogy with the purpose of developing effective teaching methods in the content fields.
Technological content knowledge (TCK)	The knowledge of how technology may develop new representations for specific content is referred to as technological content knowledge. It implies that teachers recognise that by utilising a certain technology, they may alter how students practise and comprehend topics in a given curriculum area.
Technological pedagogical knowledge (TPK)	Technological pedagogical knowledge refers to the knowledge of different technologies that can be utilized in teaching and also how integrating technology may change the way teachers teach.

Technological pedagogical content knowledge (TPACK)	The knowledge required by teachers to integrate technology into their teaching in any subject areas is referred to as technological pedagogical content knowledge. By teaching content using suitable pedagogical methods and technologies, teachers acquire an intuitive understanding of the complex interplay between the three basic components of knowledge (CK, PK, TK).

Game-based learning

Game-based learning is usually defined as a sort of gameplay about learning (Shaffer et al, 2005). The game is usually considered to be digital, however, this is not typically the case. This concept implies that the process of designing games for learning involves balancing the demand to convey the subject matter with the need to promote gameplay (Plass, Perlin, & Nordlinger, 2010).

Previous Research on the Impact of Quizizz Implementation

Quizizz helped forty suburban secondary school students acquire English idioms and reach higher levels of accomplishment. Quizizz's simplicity of use made learning idioms worthwhile. Mustika et al (2022) stated that the implementation of Quizziz has a significant impact on vocabulary teaching and learning. Its practicality and simplicity make it effective both within and beyond the classroom, serving as a convenient tool for homework. This approach offers ample flexibility, aiding in vocabulary retention and expansion, and it incorporates engaging elements like images and audio. Consequently, students experience enhanced enjoyment and contentment while using Quizziz for vocabulary learning. Mohamad, Arif, Alias, and Yunus (2020) extended the discussion by investigating the role of gamification elements within Quizizz on vocabulary acquisition. They found that the inclusion of game-like features, such as leaderboards and rewards, enhanced student engagement and motivation, consequently leading to improved vocabulary skills. The positive experience of competition and achievement through gamification proved to be influential in fostering a conducive learning environment. The findings and discussions presented by Liong et al. (2019) demonstrated that the utilization of Quizizz led to an enhancement in the achievement scores of forty secondary school students residing in suburban areas.

Previous Study on Perception Toward the Use of Quizizz in English Classroom

A previous study has been conducted by Farah (2021) studied the EFL students' perception and motivation toward the use of Quizizz in English e-classsroom, found out that students showed positive responses and agreed that English materials can be delivered well by using Quizizz. Amalia in 2020 study findings indicated the students' motivation increased because of its gamification features. Another study of students' perception towards the use of Quizizz as an online assessment tool for English teaching and learning. Huei et al. (2021) investigated students' perceptions of Quizizz in the context of language learning in rural areas. Their research highlighted that students appreciated the immediate feedback provided by Quizizz, which allowed them to identify and correct their mistakes promptly. The convenience of accessing Quizizz online enabled students in remote areas to engage with vocabulary exercises outside the traditional classroom setting. Suharni et. al (2021) studied the students' perception on the use of the Quizizz application in learning English at Junior High School in Riau, found that the students were enjoying their lessons, and they were motivated and interested in learning English.

METHODOLOGY

The research design employed in this study is quantitative method approach. The study used a quasi-experimental approach, notably a pretest-posttest nonequivalent design. The pre-test and post-test scores were utilised to assess the impact of Quizizz on the student's performance. The two conditions that the same group were put in are traditional classroom and modern classroom where the researcher implemented Quizizz in English lessons. The questionnaire was used to measure the respondents' perceptions of the examinee views regarding the implementation in terms of general perception, ease of use and learning.

The current study was conducted in a rural school, SMK Desa Kencana, Felda Sahabat 16, Lahad Datu, Sabah. There are 1700 students enrolled and take English subjects. The population of interest comprises only one class that consists of 33 students, specifically Form 3 students. The study included 55% female participants, a total of 18 female students and 45% male participants which make a total of 15 male students reflecting a fairly balanced representation. This gender distribution ensures a well-rounded perspective on the effectiveness of online game-based platforms, capturing insights from individuals of different gender identities. The current study utilized non-random sampling which is purposive sampling. Participants were selected intentionally based on their mixed abilities in terms of language proficiency level.

The questionnaire was adapted from Journal of Education and e-Learning Research, 2021, 8(2): 135-142 by Law et al., 2021, and certified by an acknowledged lecturer from the Faculty of Psychology and Education at Universiti Malaysia Sabah to confirm its validity.

Table 2 Reliability Test (Cronbach's Alpha)

Reliability Statistics	
Cronbach's Alpha	N of Items
.816	6

The reliability of this study is measured using Cronbach's Alpha reliability method and has resulted in a value of 0.816 presented in Table 2. According to Konting et al (2009), it showed that the reliability level of the questionnaire is fairly high. A descriptive statistic calculated using SPSS Version 28.0 software was used to analyze the questionnaire. Weighted mean was utilized to obtain the students' perception towards the implementation of Quizizz in English lessons. Data were analyzed by implementation Likert scale. Perception test results from the two modes of assessment were statistically processed using the t-test for independentt sample means to the hypothesis of no significant difference at the 0.05 level of significance between them. The researcher utilised a Likert Scale to collect students' responses in the form of five statements: Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD).

FINDINGS & DISCUSSION

Table 3 presents the descriptive statistics for the test scores before (pre-intervention) and after (post-intervention) of implementing Quizizz in English lessons. For the variable "Pretest (%)" the mean score before the intervention was 50.76, with a standard deviation of 14.727. It indicated the average performance of the students on the test before any intervention was applied. After

the intervention, the mean test score for the same group of students increased to 69.15. The corresponding standard deviation decreased slightly to 10.955.

Table 3 Paired Samples Statistics of Pre-test and Post-test Results

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest (%)	50.76	33	14.727	2.564
	Post test (%)	69.15	33	10.955	1.907

This suggests that, on average, students demonstrated an improvement in their test scores after participating in the Quizizz. Overall, the results suggested that the implementation of Quizizz in language learning was effective in enhancing students' vocabulary. The post-intervention scores were consistently higher than the pre-intervention scores for both variables. The decreases in standard deviations after the intervention indicated a reduction in variability among the students' test scores, potentially highlighting a more consistent improvement across the group.

Table 4 Paired Samples Correlations of Pre-test and Post-test Results

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	Pretest (%) & Post test (%)	33	.498	.003

Table 4 presents the Pearson correlation coefficients between these scores. Based on the table above, the correlation between the paired differences is .498 suggesting a strong positive correlation between the scores in pre-test and post-test. This correlation coefficient reinforces the consistency of the participants' performance across the two conditions. The p-value is 0.003 < 0.01, which proved that there is a significant relationship between the two variables.

In table 5, the t-test statistic is -18.394 with a degrees of freedom (df) of 32. The difference between the mean of each condition (50.76 and 69.15) is 1.992. -18.394. The confidence intervals showed that 95% certain that the population difference lies somewhere between -23.100 and -13.687. The p-value associated with this t-test is 0.000, which is less than the common alpha level of 0.05. This p-value indicated that the difference between the mean scores of pre-test and post-test is statistically significant. Since the p-value is less than the alpha level, the null hypothesis is rejected(H0). Therefore, there is evidence to support the alternative hypothesis (H1), suggesting that there is a significant difference between the mean scores of pre-test and post-test. The paired samples t-test analysis indicated that there is a statistically significant difference between the mean scores of pre-test and post-test. Participants' performance differed significantly under these two tests.

Table 5 Paired Samples Test of Pre-test and Post-test Results

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Pretest (%) - Post test (%)	-18.394	13.273	2.311	-23.100	-13.687	-7.961	32	.000

This finding is consistent with previous studies (Permana et al., 2020; Mustika et al., 2022; Law et al., 2023) indicating that interactive platforms such as Quizizz can effectively improve vocabulary acquisition through repeated exposure and interaction. In addition, this improvement is in line with Vygotsky's focus on social interaction and scaffolding. Quizizz's instant response and supportive nature enabled students to access knowledge inside their ZPD, encouraging progressive vocabulary expansion through directed interaction with the platform. Krashen's theory highlights the importance of meaningful, context-rich input for language acquisition. This alligned with the previous study, Amalina in 2020 and Suharni et. al (2021) stated that Quizizz could create a positive and competitive environment to the students as well as bringing enjoyment and motivation in English learning.

Table 6 Descriptive Statistics of the Questionnaire Result

Descriptive Statistics							
	N	Range	Minimum	Maximum	Sum	Mean	Std. Deviation
I am more focused on the lesson once the teacher uses Quizizz.	33	3	2	5	149	4.52	.667
I memorize the vocabulary faster once I play Quizizz.	33	3	2	5	136	4.12	.820
I have more opportunities to learn English by using Quizizz.	33	4	1	5	143	4.33	.890
Quizizz feedback for questions makes me focus.	33	4	1	5	141	4.27	1.069
Quizizz helps me to collaborate with others (my classmates and family members)	33	4	1	5	151	4.58	.792
Quizizz is an effective tool to help me master vocabulary.	33	4	1	5	144	4.36	.783
Valid N (listwise)	33						

The researcher explored participants' perception using a Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Table 6 presented the descriptive statistics for this Likert scale variable. The mean of perception is calculated as for Statement 1 is 4.52, Statement 2 is 4.12, Statement 3 is 4.33, Statement 4 is 4.27, Statement 5 is 4.58, and lastly, Statement 6 is 4.36. The highest mean is 4.58 whereby the lowest mean is 4.12. These values indicated positive response across all participants. Since the scale ranges from 1 to 5, a mean value close to the scale of 5 suggested a higher or positive perception on average.

Based on the descriptive statistics of the questionnaire result, the majority of the respondents showed a significant positive perception of the implementation of Quizizz in English classroom. The practicality of using Quizizz for vocabulary acquisition was supported by the fairly high average score achieved based on questionnaire results of students' perception. Alfehaid (2019) concurs, emphasized the enhancement of learners' achievement and the beneficial impact on vocabulary acquisition through online vocabulary games. Almost all respondents agreed on the immersive aspect of Quizizz's learning environment. They agreed that Quizizz has collaborative features, provides constructive feedback, and provides significant learning possibilities, and these correspond with the previous study, Amalia, 2020 and Suharni et. al., 2021.

Implications of the study

The findings of such a study could provide significant insights beyond the current investigation's scope. The first implication in this study is technology integration in rural settings, where the educators learn how Quizizz could be effectively integrated into rural school settings has broader implications for the implementation of educational technology in resource-constrained environments. Rural schools frequently faced resource constraint. Researchers could be versatile and innovative in devising approaches that account for technological, material, and facility restrictions. The second implication of this study is investigating the impact of Quizizz could demonstrate how gamified learning experiences improve student engagement and motivation. These findings can encourage educators to investigate comparable interactive tools to create a more dynamic and engaging learning environment, especially in rural schools. In addition, knowing how Quizizz affects vocabulary improvement in rural schools can aid in the identification of learning gaps and the tailoring of solutions. Lastly, the implication of this study is professional development. The study's findings highlight the relevance of teacher training and professional development in properly integrating digital tools such as Quizizz into the classroom. This could result in more thorough training programmes for educators in remote areas. Finally, the findings of this study have significance for the holistic development of rural students. Enhanced vocabulary skills can lead to enhanced communication, comprehension, and critical thinking abilities, preparing pupils for academic success and beyond.

Limitations of the study

This study is subject to certain limitations. The findings of this study may have limited generalizability beyond the specific rural schools and contexts studied. Rural schools can vary significantly in terms of resources, culture, and educational practices. The study's sample size was restricted due to the availability of participants in rural schools. A small sample size could impact the statistical power of the study's conclusions. Limited access to technology and reliable internet connectivity in rural schools have impacted the implementation of game-based learning and the collection of data. Conducting an in-depth study within the constraints of a specific time frame has limited the depth and breadth of data collection and analysis.

CONCLUSION

This study aims to investigate the impact of implementing Quizizz in English lessons on developing vocabulary skill as well as gaining the students' perceptions Quiziz implementation in English lessons. The results from the pre-test and post-test shows that there is a significant positive impact of implementing Quizizz in English lesson on developing students' vocabulary skills in rural area. The finding of the study depicts a positive perception towards the implementation of Quizizz in English lessons. These include the general perception, interest and vocabulary skills after implementing Quizizz. This study's findings confirm the association between Quizizz and vocabulary skills. The finding of the current study result can be explained by the fact that Quizizz employs the vocabulary theory of marginal impacts, and it is multimodal.

While the current study sheds light on the impact of implementing Quizizz in English lessons to enhance vocabulary development among secondary school students in rural areas of Malaysia, this study acknowledged certain limitations which it has limited generalizability beyond the specific rural schools and contexts studied. The small sample size from this study and the limited access to technology and internet connection in this study have impacted the implementation of data collection.

There are several recommendations for future research research that can provide deeper insights and a comprehensive understanding of the implementation of Quizizz in rural areas. from the current study, it is recommended for future researchers to explore differential impact, investigating whether the impact of Quizizz on vocabulary development varies based on students' proficiency levels, learning styles, and prior technology experience. In addition, comparing subgroups within the rural student population can provide valuable insights into who benefits most from this technology-driven approach. On the other hand, it is suggested for future researchers to conduct a comprehensive assessment of the technological infrastructure in rural schools, considering factors such as internet connectivity, access to devices, and technology literacy. This investigation can uncover potential barriers and inform strategies to address them. Lastly, future researchers are recommended to do comparative analysis to compare the effectiveness of Quizizz with other technology-based and traditional vocabulary enhancement methods. This comparison can provide insights into the unique advantages and limitations of Quizizz in rural Malaysian secondary schools.

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Using Digital Multimodal Composing Technique to Enhance the Speaking Performance of Low-Proficiency Students: A Conceptual Paper

Sharifah Yong Nadia Omar Salleh[1], and Wirawati Ngui Yi Xe[2]

[1,2]Faculty of Psychology and Education, Universiti Malaysia Sabah
sharifahyongnadia@gmail.com; wirawati.ngui@ums.edu.my
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ABSTRACT

Issues and challenges surrounding the area of speaking skills are seems to be more demanding. However, the advances in technology have provided more opportunities for ESL learners to explore their academic potential as it offers multimodal spaces to boost learning. Technology is known for being capable to cater to various learning styles. One of the technological advances to enhance learning ability is through the digital multimodal composing technique. It incorporates images, sound, animation, and texts into their tasks, thus promoting creativity among learners. Therefore, this paper will propose a conceptual framework to visualise a research project and the way it puts into action. The proposed framework has been developed based on the digital multimodal composing (DMC) technique into the speaking classroom. It is believed that DMC technique could potentially enhanced speaking performance among the low proficiency students. Based on the framework, the DMC technique will serve as the treatments by incorporating the basis of multimodal approach into the speaking tasks. Tasks are designed based on the current social media trends so that students could relate their existing knowledge into learning. More interestingly, DMC speaking tasks could be completed using their own gadgets to create more opportunities for students to explore learning inside and outside classroom context. The proposed framework would benefit the English teachers in the multimodal-based instructions and provide ways to improve necessary aspects in the use of educational technology for more impactful ESL classroom teaching and learning.

Keywords: speaking, students, technology, DMC, digital

INTRODUCTION

The access to digitalization as well as the rapid development of industrial revolution 4.0 has caused everyone to strive towards coping with challenges surrounding their fast-moving society. Thus, the use of technology in Malaysian education has gradually become more prevalent these days. The idea of allowing technological access to various learning applications seems ambitious, but it is likely capable of decreasing the academic gap between students from different areas and background (Zainal & Zainuddin, 2020). Therefore, teachers should take responsibility in innovating and creating teaching practices that manifest in the 21st century classroom (Khaizer & Rizal, 2023).

The emphasis on Information and Communication Technology (ICT) has been included in the Malaysia Education Blueprint 2013-2025 in which school students are required to learn how to use technology and effectively utilise it to improve their learning. The blueprint has currently reached the Wave 3 (2021-2025) and it is time to optimise ICT in the classroom pedagogy and practices.

Technology integration can be defined as the efficient use of information ICT and the proper application of technology in education to achieve targeted learning outcomes (Rahmadi, 2021). The 21st century education demands teachers to be adaptable in their teaching approaches in order to improvise teaching to meet the current needs. They need to be knowledgeable in new methodologies to be able to cope with the fast-changing trends in technology and digitalization. This is because the integration of technology could revamp and innovate the traditional teaching and learning method as well as create opportunity for students to master their studies with their own learning strategies using any apps or tools (Hasin & Nasir, 2021). This could boost critical thinking and creativity among students, thus allowing them to grasp substantial and comprehensive learning.

LITERATURE REVIEW

Despite the rapid development of technologies around the world, second language (L2) speaking skills have become a long debated national issue. There are students who still struggle to speak in English despite years of learning English as a required subject in school. Firstly, one of the factors that contributes to low speaking proficiency among the students is the fact that English is not their first language. Kachru (1992) has classified the world Englishes into three; inner circle, outer circle and expanding circle. Malaysia is identified as outer circle and it is notable that English is not our first language but still significant as communication as well as education purpose (Suzieanna et al., 2020). For that reason, students normally use, learn and speak the language during English lesson and back to their first language when they are outside of the classroom setting (Adickalam & Yunus, 2022). Therefore, they do not have ample practices to articulate words, phrases or even sentences of English in their daily lives.

Secondly, while the four skills are taught in schools, the gravity of teaching speaking and listening skills is less compared to reading and writing skills (Kandasamy & Habil, 2018). Although examinations focus on all four skills, Malaysian national standardise assessments such as Malaysia Certificate of Education or *Sijil Pelajaran Malaysia* (SPM) has a greater emphasis on reading and writing compared to speaking and listening tests (Ramalingam et al., 2022). Thus, inadequate of students' participation in real or mock presentations and speech-based activities will slow down their mastery of speaking skills (Liang, 2023), hence delay the development of students' communication skills as this skill is flourished and empowered by practice (Kashinathan & Abdul Aziz, 2021).

Thirdly, most teaching speaking practices these days are too teacher-centered (Krish et al., 2019). Kashinathan and Abdul Aziz (2021) assert that teachers persist in using traditional classroom practices to prepare students for examinations despite their motivation to create communicative language teaching into their classrooms. In addition, the School-Based Oral Assessment (SBOA) is administered by the schoolteachers themselves. This has created a shortcut method among teachers by using traditional scripted speech which lacks spontaneity especially to the low proficiency students(Rashid et al., 2017). Scripted speech can cause speakers to get nervous when they forget the parts they have memorized. It leads to hesitation and leaves a lot of gaps in their speaking since they are trying to recall what has been memorized. Thus, it shifts away from the real speaking nature.

Finally, despite the advancement of technology worldwide and the advantages of it beingg well-known around the world, teachers' resistance is one of the challenges to pursuing technology integration into the classroom. Although local studies involving younger generations benefited from the use of technology to improve speaking skills such as Fauzi et al., (2023) and Santhanasamy and Yunus (2022), the negative attitudes among teachers towards technology are still prevailing. Some of them believe that education technology is not

convincing, hard to discard the traditional and prevailing culture in education, do not see the significance of technology-assisted learning, lack encouragement to apply technology in the classroom and least awareness in which part of technology can be utilised in the classroom (Scherer et al., 2021).

One of the most common practices in digital technology these days is digital multimodal composing (DMC). Although the term is less familiar in the mainstream education, the use of DMC is applicable to learners who own mobile phones and social media accounts. The dominant scholars behind DMC such as Hafner and Ho (2020) and Kim et al., (2023) defined it as a form of instructional activity that includes learners with the fusion of texts and other semiotic modes like images, movement, and sound by using digital tools. The use of DMC is one of the most recent strategies to showcase meaning to the audience in the form of multiple modes (Hafner & Ho, 2020). In today's world, we could identify DMC in social media features such as reels, videos, or photos where the user incorporates texts, emojis, stickers, and memes in their posts using various styles and colours.

Therefore, as the world becomes more multimodal, ESL education has the urgency to diffuse the current technology into classroom context due to the development of more multisemiotic digital input in the ESL learners' lives (Belcher, 2017). However, the multimodal approach in the ESL speaking classroom in Malaysia is still underexplored despite the surge of interest in the past years. Therefore, this study will propose DMC technique to further explored the impacts of DMC towards the speaking performance of low proficiency ESL secondary school learners. Below is the conceptual framework of the study.

Conceptual Framework for DMC Task-Based Treatments

A conceptual framework can visualise research agenda that will later notify stakeholders to be aware of the full potential of DMC technique in the speaking classroom. Thus, this paper proposed a conceptual framework surrounding learning theories especially the principles of multimodality into classroom tasks. The development of the framework requires a great understanding of complexities surrounding the way people learn these days and the impacts of technology into formal learning.

Research shows that proliferation of information in modes such as visuals, gestures, audio and text-based could create various approach of learning (Nouri, 2018). In addition, the advance of technology has expanded opportunity for individuals including learners to convey and communicate information using numerous modes (Blum & Barger, 2018). Therefore, as students are increasingly diverse in their communicative approach, digital multimodal composing could help in expanding learning opportunity.

The proposed framework below (Figure 1.0) is intended for secondary school students who are empirically low in their speaking performance. Low- proficiency students are the best fit as it allows us to identify the contrast of findings before and after the treatment. Therefore, the aim of this paper is to propose a conceptual framework to guide educators about the DMC technique to increase speaking performance and to develop a research agenda for DMC speaking tasks as a treatment.

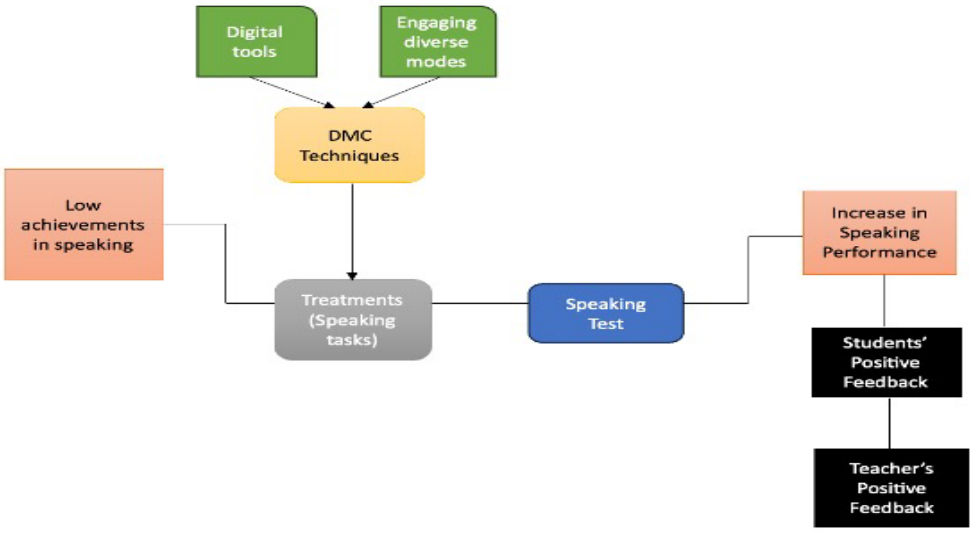

Figure 1 Conceptual Framework of the Research

Figure 1 illustrates the proposed conceptual framework for DMC technique used in the speaking task to increase speaking performance. The image presents the flow of the way DMC techniques implemented into the speaking tasks and conducted them to the low proficiency students. Digital tools and diverse modes are necessary elements to create a DMC-based task. These tasks will serve as a treatment. The selection of digital tools is depending on the preferences of students and the availability of facility to support the tasks. In this paper, mobile phones will be the main source of digital tool as there are more common these days. The data from the speaking wil serve as the basis for more research exploration such as interviews.

Low Achievements in Speaking Test

The lower achievements in a speaking test often caused by several factors. One of the most common issues is the lack of speaking practice. The little amount of practices has led students to be lack in the mastery of vocabulary, mistakes in grammar and poor pronunciation (Chand, 2021). Moreover, speaking test has more technical measures such as pronunciation, range, grammar, vocabulary and context. This can be referred at Appendix 1, the Common European Framework Rubrics (CEFR) for speaking test, which is currently used in the standardised school examination. It consists of five elements to be fulfilled namely range, accuracy, fluency, interaction and coherence. Consequently, lack of practices cause fear and nervousness among students which finally affect their performance in the test.

Digital Multimodal Composing

The term Digital Multimodal Composing (DMC) initially borrows from the notion of multiliteracies generated by The New London Group (Cazden et al., 1996). It highlights how literacy teaching may prepare learners for a changing world (Tour & Barnes, 2022). This is parallel with the technological advancement in language learning that many teachers utilize digital texts which are varied in modes (audio, visual, images, gestures, etc). Those digital texts contain semiotic resources which are called digital multimodal which gives rise to the meaning-making of the texts as literacy practices, including DMC (Unsworth & Mills, 2020).

DMC in ESL education is concerned with the activities that encourage students to use digital technologies to create texts in a variety of semiotic modalities including texts, images, and sound (Hafner & Ho, 2020). In addition, Jiang and Ren (2021) proposed that using DMC by teachers in ESL classrooms can provide a variety of ways for learners to display and

negotiate their identities, thus encouraging greater commitment to their learning. Therefore, the DMC technique used in the treatments will be specified into different modes. For instance, treatment phase one will be focusing on two modes, e.g., texts and audio. The ideas to blend different modes will boost specific skills and promotes critical thinking in each phase of the treatment.

Speaking Tasks

A task is something that students need to accomplish using scaffolded language resources or some pre-existing knowledge or skills. According to Ellis (2003), there are four criteria of task, (i) the main focus would be on meaning, (ii) a 'gap' must be recognised, (iii) students used their available resources and (iv) the outcomes are not necessarily language based. Hence, task is selected among any other learning practices, i.e., activity, exercise and project, because it does not have strict control on monitoring students but promote scaffolding. Also, it has more balanced classroom atmosphere which has smaller range of physical movement and yet not strictly performed in a passive motion as well. Thus, teacher has more controlled towards teaching and learning but still allowing students to optimise their interaction and spaces with their peers.

As the framework proposed treatments with the fusion of DMC techniques, all tasks will be designed based on the principles of DMC. Students are allowed to use their mobile phones to complete the tasks. Tasks are different for each phase of treatment so that students are exposed into diverse problem solving and critical thinking. Educators may use theme contained in the speaking syllabus to design the task. It helps students to be more familiar with topics surrounding speaking syllabus. DMC task-based treatments will be the main idea in the framework to identify the effectiveness of multimodal learning approach with the use of technology.

Speaking Tests

Speaking tests will be conducted to find out the effects of DMC techniques used in the treatments. It will be conducted before and after the treatments. Generally, testing is a part of learning by letting students recognize their present knowledge and skills (Ellis, 2003). Meanwhile, the results of the test portray their strengths and weaknesses in particular topics or areas (Bui & Tai, 2022). Therefore, the role of test presented in the framework is to identify any improvements in the students' speaking performance before and after receiving the treatments. The framework suggests that speaking test can be designed based on the real school speaking test such as School Based Oral Assessment (SBOA). It offers higher validity as it uses an established test paper. In this paper, empirical data serves as a solid foundation for further data collection such as interviews.

Speaking Performance

Chomsky (1996) has stated that performance is related to the term of competence and is defined as the specific application of a particular language in the production and understanding of utterances. On the other hand, Brown (2000) defined performance as an observable and solid exhibition or recognition of competence. Meanwhile, Ellis (2003) has more specific claims about language performance which proposed the use of grammar in the comprehension and production of language which eventually sees performance based on grammar and content of language. These definitions indicate that performance can be examined by the actual action of something. Thus, the highs and lows of someone's competence can certainly be measured by their performance.

Nonetheless, speaking performance is then understood as the act of conveying messages from the speaker to the listener through words, utterances, and sentences where their performance in speaking will automatically show their high, intermediate and low competence (Novitasari,

2020). Therefore, this paper will use CEFR as the main rubric to measure students' performance as it now regarded as the main rubric in the standardise English examination.

Feedback

Feedback proposed in the framework refers to the students' opinions regarding the DMC technique applied in the tasks and the way it affects them positively or negatively in their speaking performance. It is important to acknowledge their thoughts as they give insightful perspectives on the impacts of multimodal approach towards speaking skills. Also, it offers greater understanding on the areas that need future improvements. Meanwhile, teacher's feedback is also important as teacher is more experienced in noticing situations happening during the treatments. Also, her opinions matter as she is the one who will conduct the speaking test. By combining feedback and test scores, this framework will be able to propose substantial findings for future reference.

CONCLUSION

Derived from the basis of multimodal-based instruction, DMC could potentially expand the teaching and learning potential in the field of ESL. Although the use of DMC in the area of speaking is still in the Malaysian context, it is the right time to explore more opportunities for ESL enhancement. The notions of fast changing trends in digital technologies should not be neglected as many literatures have supported its capability to develop conducive and impactful learning environment. Therefore, studies surrounding DMC should be executed as it could possibly provide better and equal learning opportunities to all level of learners.

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Appendix 1
CEFR rubrics

Table 5.5: ORAL ASSESSMENT CRITERIA GRID (CEF Table 3)

	RANGE	ACCURACY	FLUENCY	INTERACTION	COHERENCE
C2	Shows great flexibility reformulating ideas in differing linguistic forms to convey finer shades of meaning precisely, to give emphasis, to differentiate and to eliminate ambiguity. Also has a good command of idiomatic expressions and colloquialisms.	Maintains consistent grammatical control of complex language, even while attention is otherwise engaged (e.g. in forward planning, in monitoring others' reactions).	Can express him/herself spontaneously at length with a natural colloquial flow, avoiding or backtracking around any difficulty so smoothly that the interlocutor is hardly aware of it.	Can interact with ease and skill, picking up and using non-verbal and intonational cues apparently effortlessly. Can interweave his/her contribution into the joint discourse with fully natural turntaking, referencing, allusion making etc.	Can create coherent and cohesive discourse making full and appropriate use of a variety of organisational patterns and a wide range of connectors and other cohesive devices.
C1+					
C1	Has a good command of a broad range of language allowing him/her to select a formulation to express him/herself clearly in an appropriate style on a wide range of general, academic, professional or leisure topics without having to restrict what he/she wants to say.	Consistently maintains a high degree of grammatical accuracy; errors are rare, difficult to spot and generally corrected when they do occur.	Can express him/herself fluently and spontaneously, almost effortlessly. Only a conceptually difficult subject can hinder a natural, smooth flow of language.	Can select a suitable phrase from a readily available range of discourse functions to preface his remarks in order to get or to keep the floor and to relate his/her own contributions skilfully to those of other speakers.	Can produce clear, smoothly flowing, well-structured speech, showing controlled use of organisational patterns, connectors and cohesive devices.
B2+					
B2	Has a sufficient range of language to be able to give clear descriptions, express viewpoints on most general topics, without much conspicuous searching for words, using some complex sentence forms to do so.	Shows a relatively high degree of grammatical control. Does not make errors which cause misunderstanding, and can correct most of his/her mistakes.	Can produce stretches of language with a fairly even tempo; although he/she can be hesitant as he or she searches for patterns and expressions, there are few noticeably long pauses.	Can initiate discourse, take his/her turn when appropriate and end conversation when he/she needs to, though he/she may not always do this elegantly. Can help the discussion along on familiar ground confirming comprehension, inviting others in, etc.	Can use a limited number of cohesive devices to link his/her utterances into clear, coherent discourse, though there may be some "jumpiness" in a long contribution.
B1+					
B1	Has enough language to get by, with sufficient vocabulary to express him/herself with some hesitation and circumlocutions on topics such as family, hobbies and interests, work, travel, and current events.	Uses reasonably accurately a repertoire of frequently used "routines" and patterns associated with more predictable situations.	Can keep going comprehensibly, even though pausing for grammatical and lexical planning and repair is very evident, especially in longer stretches of free production.	Can initiate, maintain and close simple face-to-face conversation on topics that are familiar or of personal interest. Can repeat back part of what someone has said to confirm mutual understanding.	Can link a series of shorter, discrete simple elements into a connected, linear sequence of points.
A2+					
A2	Uses basic sentence patterns with memorised phrases, groups of a few words and formulae in order to communicate limited information in simple everyday situations.	Uses some simple structures correctly, but still systematically makes basic mistakes.	Can make him/herself understood in very short utterances, even though pauses, false starts and reformulation are very evident.	Can ask and answer questions and respond to simple statements. Can indicate when he/she is following but is rarely able to understand enough to keep conversation going of his/her own accord.	Can link groups of words with simple connections like "and", "but" and "because".
A1+					
A1	Has a very basic repertoire of words and simple phrases related to personal details and particular concrete situations.	Shows only limited control of a few simple grammatical structures and sentence patterns in a memorised repertoire.	Can manage very short, isolated, mainly pre-packaged utterances, with much pausing to search for expressions, to articulate less familiar words, and to repair communication.	Can ask and answer questions about personal details. Can interact in a simple way but communication is totally dependent on repetition, rephrasing and repair.	Can link words or groups of words with very basic linear connectors like "and" or "then".
Below A1					

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