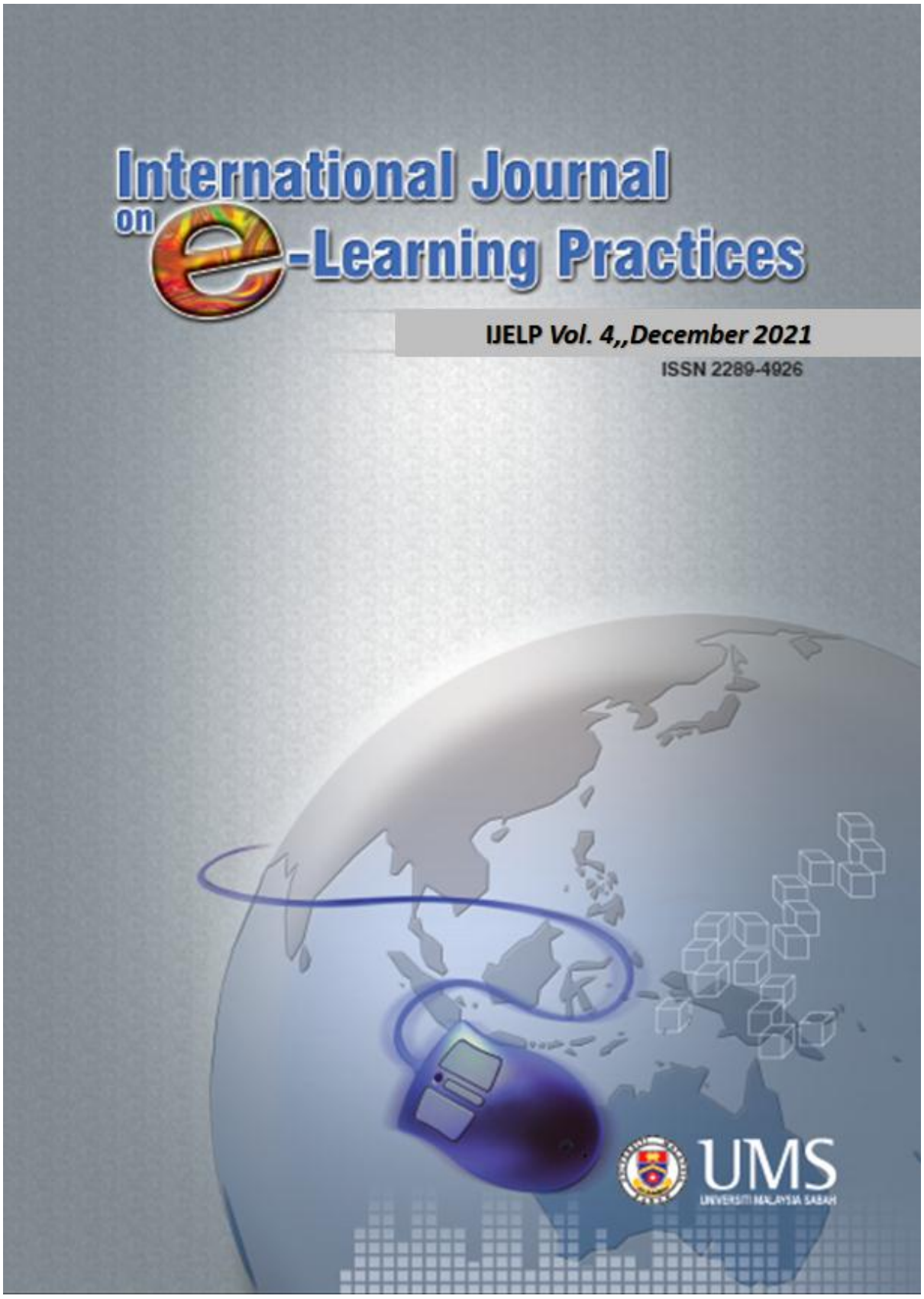
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About the Journal

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 SCOPUS (Elsevier) after six periodic issues are published.

Editorial Board

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EDITORIAL PREFACE

Welcome to Volume 4 2021 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 worldwide audience.

For Volume 4 of IJELP, we have a selection of articles covering a number of stimulating topics related to the applications of ICT, blended learning, Computer Assisted Instruction (CAI), and e-learning practices from overseas and Malaysia. There are five articles from Vietnam focusing on the studies on learning via the use of technologies such as Quizlet, Memrise, academic writing via Google Drive and also on students' challenges on using ICT during the Covid 19 pandemic. Meanwhile, the Malaysian studies cover an interesting array of topics ranging from using digital game such Minecraft, survey using TPACK and the use of creativity technique such as brainstorming via online platform. 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 a number of 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 4, 2021
Editor-in-Chief
Associate Professor Dr Tan Choon Keong

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Contents

TECHNOLOGY INTEGRATION AMONG SCIENCE TEACHERS IN THE IMPLEMENTATION OF THE 21ST CENTURY LEARNING

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ABSTRACT

The Ministry of Education (MOE) has launched a reformation of the curriculum through *Kurikulum Standard Sekolah Menengah* (KSSM) start since 2017. The new curriculum is focused on the aspects of the competencies and skills that can fulfil the need of 21st century education. Teachers play an important role in determining the outcomes of 21st century learning in terms of their knowledge and skills. Thus, the purpose of this study was to find out the integration of technology among secondary school Science teachers in their implementation of 21st century learning. The design of the study was a quantitative approach with survey method. A set of questionnaires was adapted on a 5-point Likert scale to measure the skill level among the teachers. The study involved 100 Science teachers from 11 secondary schools around Kota Kinabalu area, Sabah. Descriptive statistics and inference statistics such as mean, standard deviation, t-test and one-way ANOVA were performed using Statistical Package for Social Science (SPSS) version 25.0. The findings showed that the mean scores of secondary school Science teachers in Kota Kinabalu are high (mean = 3.73). T-test and one-way ANOVA test revealed that (i) there was no significant difference in teacher skills based on gender (ii) there was significant difference in teacher skills based on the number of courses attended.

Keywords: technology integration, 21st Century Learning, Science Teachers

INTRODUCTION

In the twenty-first century, globalisation and the advancement of information and communication technology (ICT) have drastically altered the way we work and study. As a result, the MOE has worked hard in recent years to develop the 21st century learning (Pembelajaran abad ke-21) project, which aims to equip students to confront the challenges of being able to compete worldwide in the twenty-first century. With that, students will be exposed to the skills that are said to be in line with the 21st century. Among the skills emphasized in 21st century education are the skills of collaboration, communication, creativity and critical thinking or as a 4C concept (Voogt & Roblin, 2012).

However, the problem of the implementation of 21st century learning is now gaining less attention from teachers because teachers themselves may not understand the rationale behind the implementation of 21st century learning and are more likely to simply accept orders from their superiors. In the meantime, teachers also think that the provision of a classroom that has a 21st century ecosystem is enough without appreciating the concept of 4C outlined in 21st century learning. In fact, according to Tan Sri Dr Khair Mohamad Yusof, the former KPPM:

'*Pembelajaran Abad ke-21 bukan setakat merujuk kepada penggunaan gajet, perkakasan dan perisian terkini teknologi ICT dalam bilik darjah. Sebenarnya Pembelajaran Abad ke-21 bermaksud guru menggunakan kaedah atau pedagogi PdPc berpusatkan murid (student-centred) serta menekankan elemen membina Kemahiran Berfikir Aras Tinggi (KBAT) dalam diri murid'*.
(Majalah Pendidik, Nov 2016, page 14 in Ahmad (2016))

Translation:
'21st century learning does not only refer to the use of gadgets, equipment and the latest classroom technology ICT software. It actually means that the teacher uses the pedagogy or method that is student-centred while stressing on the importance of Higher Order Thinking skills of the students'
(Educational Magazine, Nov 2016, page 14 in Ahmad (2016))

Thus, it is clear to say that the teachers' skills in terms of pedagogy are an important aspect in the implementation of this initiative. The Malaysian Education Development Plan (PPPM) has targeted that every student would master the 4C skills. This is because, according to the results of the TIMMS (Trend in International Mathematics and Science Study), our pupils have been in the lowest group of achievers since 1999. Although Malaysia's performance in TIMSS 2015 for Science subjects improved to 24th place (from 32nd place in 2011), it is still considered unsatisfactory (Abdullah, 2018) when compared to other neighbouring Southeast Asian countries such as Vietnam, Thailand, and Singapore. This clearly demonstrates that students still lack mastery of 21st-century skills in answering high-level questions, as well as the talents necessary by potential employers.

RESEARCH OBJECTIVES

The objectives of this study were to investigate the secondary school Science teachers' level of technology integration in 21st century learning. The specific objectives of this study were as followed:

1. Identify the secondary school Science teachers' level of technology integration in 21st century learning.
2. Identify the differences among secondary school Science teachers' level of technology integration in 21st century learning based on gender and the number of courses attended.

RESEARCH QUESTIONS

The following research questions based on the objectives of the study were addressed:

1. What is the level of secondary school Science teachers on the integration of technology in the implementation of 21st century learning?
2. Is there a significant difference among the secondary school Science teachers on the integration of technology in the implementation of 21st century learning by gender?
3. Is there a significant difference among the secondary school Science teachers towards the integration of technology in the implementation of 21st century learning by the number of courses attended?

RESEARCH HYPOTHESIS

Two null hypotheses are formed in this study as shown below:

H_o1: There is no significant difference among the secondary school Science teachers towards the integration of technology in the implementation of 21st century learning by gender.

$H_0 2$: There is no significant difference among the secondary school Science teachers towards the integration of technology in the implementation of 21st century learning by the number of courses attended.

LITERATURE REVIEW

These 21st-century skills have been emphasised since the twentieth century (Mosenson & Fox, 2011). Partnerships for 21st Century Skills by P21 and enGauge 21st Century Skills by NCREL & Meitiri Group are two organisations or agencies in the United States that have established this 21st century skills framework (Voogt & Roblin, 2012). Most of these frameworks have laid the groundwork for key topics to be supported by 21st century skills, or the 4C concept: collaboration skills, communication skills, creative skills and critical thinking skills (MOE, 2018).

21st century learning should be based on student-centred learning because 21st century students, namely generation Z who were born from January 1996 to the present (Tapscott, 2009) have a different way of learning. However, there are still teachers who teach using a teacher-centered approach (Embi, 2016). Thus, in realizing the transformation of education in the 21st century, a shift in the delivery process of a teacher in the classroom is necessary as they are facing the generation-Z group. Teachers who act as facilitators in the classrooms must prepare students for collaborations in a variety of scenarios by using various types of methods, including the use of technology (Embi, 2016). Apart from that, the partnership for 21st century skills has also emphasized the need of a teacher in thinking, planning, discussing in the implementation of 21st century learning (Voogt & Roblin, 2012).

As a result, the Ministry of Education (MOE) began implementing 21st century learning in 2014, in line with the global trend. This 21st century learning concept is a student-centred learning method that focuses on the development of four core standard skills: collaboration, communication, creativity, critical thinking, and values and ethics. Thus, MOE has trained a number of coaches at all levels to improve the quality of teachers with this method (MOE, 2018).

Past Studies

There have been various studies that focused on the application of 21st century learning in Malaysia. Amran and Rosli (2017), for example, employed qualitative methodologies to investigate secondary school Mathematics teachers' understanding of 21st century skills. According to the findings of this study, teachers evaluate 21st century abilities from two perspectives, thinking skills and technology skills. This clearly shows the importance of a teacher's technology skills in assisting them in conducting the teaching and learning process more confidently.

According to Abdullah et al., (2018), there are four key factors in implementing and practicing 21st century learning. Their study found that the aspects of teacher readiness in conducting the 21st century learning were still low in terms of their readiness. As a result, further effort must be made to improve oneself as a teacher so that they can be more confident in the classroom, which includes the use of technology. Furthermore, a study by Rusdin and Ali (2018) indicated the problems that teachers had in implementing this 21st century learning for Arabic Language topics. Lack of expertise, time, resources, and ICT equipment are all obstacles as they are shown in all the previous studies. Although teachers are enthusiastic about the

implementation, they believe that it will be impossible to carry out without the necessary knowledge and skills, which include ICT skills.

METHODOLOGY

This is a quantitative study that uses a survey as an instrument. The study included 11 secondary schools in Sabah, which were located in the Kota Kinabalu area. A total of 104 science teachers from secondary schools were chosen randomly, however, only 100 questionnaires were analysed. After obtaining permission from the Education Department of Sabah and the school administrators, the researcher administered the questionnaire at the schools. Part A of the research instrument constitutes the demographic information, and Part B is about teachers' technology integration in the implementation of 21st century learning, which is adapted from the previous studies. The questionnaire used a "Likert" scale of five options: (5) very agree, (4) agree, (3) disagree, (2) disagree, and (1) strongly disagree.

The reliability of the questionnaire was reported using the value of Cronbach's Alpha coefficient. According to Hair et al., (2018), values between 0.6 - 0.7 are considered as the minimum acceptable level while Cohen et al., (2011) suggested a value of 0.8 as an acceptable reliability value. Since the reliability value of the skill variable is 0.92, then the instrument of this study can be said to have acceptable reliability.

FINDINGS

Data for this study were processed using Statistical Package for the Social Science version 25.0 (SPSS). The respondents' profile analysis and descriptive analysis such as frequency, mean, percentage, and standard deviation were used. To address the first research question, a descriptive analysis was performed. The researcher used Table 1 to interpret the mean score level in order to answer the study question.

Table 1: Interpretation of the Min Score

Min Score	Level of Min Score
1.00 – 2.33	Low
2.34 – 3.66	Medium
3.67 – 5.00	High

Source: Jamil (2002)

The researcher employed an independent sample t-test to see the differences in the level of technology integration in 21st century learning based on gender. Meanwhile, based on the number of courses taken, the ANOVA test was used to see whether there were any differences in teachers' levels of technology integration in 21st century learning. Both second and third research questions were addressed using inferential analysis.

Respondents Profile

Table 2 shows that female teachers represent the majority of respondents (81%) while male teachers represent only 19% of the respondents. The analysis also found that the majority of respondents at 51% had attended courses from 1 to 3 times. Meanwhile, a total of 29% respondents have attended 4 to 6 times and 17% respondents for more than 6 times and only 3% had never attended any course before.

Table 2: Respondents' Profile

Background	Respondents	Frequency	Percentages (%)
Gender	Male	19	19
	Female	81	81
Total		100	100
Times to attend the course	Never	3	3
	1-3 times	51	51
	4-6 times	29	29
	More than 6 times	17	17
Total		100	100

Descriptive Statistic Findings

The mean score was 3.73 at average. There were seven items that had a high mean score ranging from 4.00 to 3.67, three items with a moderate mean score ranging from 3.65 to 3.59, and zero items with a low mean score. The descriptive statistical findings for the first research question are included in Table 3.

Table 3: Science teachers' level of technology integration in 21st century learning

Item	Min	Standard Deviation (SD)	Interpretation
Item 1	3.60	.696	Medium
Item 2	3.79	.640	High
Item 3	3.84	.631	High
Item 4	3.68	.601	High
Item 5	3.69	.734	High
Item 6	3.65	.672	Medium
Item 7	3.80	.667	High
Item 8	4.00	.725	High
Item 9	3.59	.767	Medium
Item 10	3.67	.711	High
Average	**3.73**	**.520**	**High**

Inference Statistic Findings

According to Mayers (2013), Skewness and Kurtosis values that are in the range ± 1.96 are indicators of normally distributed data. Thus, it was found in this study that the value of Skewness is in the range of 0.266 to -0.325, while the value of Kurtosis is in the range of -0.623 to -0.107. As a result, it can be assumed that the study data have been normally distributed and thus t-test and ANOVA test are achievable. Table 4 shows the result of univariate normality using Skewness and Kurtosis values to reach the parametric test assumption.

Table 4: Value of Skewness and Kurtosis

Item	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error
1	.183	.241	-.310	.478
2	.216	.241	-.623	.478
3	.137	.241	-.522	.478
4	.266	.241	-.613	.478
5	-.218	.241	-.107	.478
6	.145	.241	-.331	.478
7	.042	.241	-.363	.478
8	-.325	.241	-.137	.478
9	.034	.241	-.363	.478
10	.235	.241	-.500	.478

After the researcher performed data normality analysis as a basic condition and assumption of the adequacy of the data obtained, the parametric tests of t-test and ANOVA were performed. The following tables (Table 5 and 6) show the results of inferential statistics for both the null hypotheses.

H_o1: There is no significant difference among the secondary school Science teachers towards the integration of technology in the implementation of 21st century learning by gender.

The result of t-test based on gender has shown that there is no significant difference for teachers' level of technology integration as shown in Table 5. It was found that female teachers have more skills (mean = 3.78, SP = 0.51) than male teachers (mean = 3.52, SD = 0.49); t (1.985), df = 98, p = 0.05. Since the significant value is more than the value of p <.05, so, it can be concluded that the null hypothesis 1 was not rejected.

Table 5: T-Test result based on gender

Variable	Group						t-test		
	Male			Female					
	Mean	SD	N	Mean	SD	N	t	df	Sig.
Technology Integration	3.52	0.49	19	3.78	0.51	81	-1.985	98	0.050

**significant $p < 0.05$

$H_0$2: There is no significant difference among the secondary school Science teachers towards the integration of technology in the implementation of 21st century learning by the number of courses attended.

The results of the one-way ANOVA test based on the number of courses attended showed significant differences for the four categories are shown in Table 7. It was found that one-way ANOVA test results showed significant differences between groups with, F (3, 96) = 4.24, p = 0.00. Since the significant value is less than the p value of .05, this means that there is at least one factor that is significant than the others. So, it can be concluded that hypothesis 2 was accepted. Thus, this finding indicated that there is a difference in teachers' level of technology integration based on the number of courses attended.

Table 6: One way ANOVA result based on the number of courses attended

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.13	3	1.04	4.24	.007*
Within Groups	23.623	96	0.25		
Total	26.75	99			

*significant $p < 0.05$

To determine these differences, a post-hoc *Tukey* HSD comparison test was conducted as shown in Table 7. The results of the post-hoc test indicated that the mean score for the significant difference between the numbers of courses attended more than 6 times with 1 to 3 times and 4 to 6 times.

Table 7: *Tukey* Post-Hoc test results

(I) Number of Courses Attended	(J) Number of Courses Attended	Mean Difference (I-J)	Sig.
Never	1 – 3 times	-.04118	.999
	4 – 6 times	.01954	1.000
	More than 6 times	-.48431	.407
1 – 3 times	Never	.04118	.999
	4 – 6 times	.06072	.953
	More than 6 times	-.44314*	.010
4 – 6 times	Never	-.01954	1.000
	1 – 3 times	-.06072	.953
	More than 6 times	-.50385*	.007
More than 6 times	Never	.48431	.407
	1 – 3 times	.44314*	.010
	4 – 6 times	.50385*	.007

*significant $p < 0.05$

As indicated in Table 8, the results of the one-way ANOVA on the number of courses attended show a significant difference in teachers' level of technology integration. When comparing the mean scores of the other categories of respondents, it was found that teachers who attended courses more than six times had the highest mean scores (mean = 4.12, SD =.420, N = 17). On the other hand, lower mean scores were recorded for the other categories. For instance, teachers who attended the course 4 to 6 times had a mean score of (mean = 3.61, SD =.482, N = 29), teachers who attended the course 1 to 3 times had a mean score of (mean = 3.68, SD =.533, N = 51), and teachers who never attended the course had a mean score of (mean = 3.63, SD = 0.208, N = 3). This difference in mean scores shows that teachers who have attended the course more than six times have a higher level of technology integration.

Table 8: Descriptive analysis based on the number of courses attended

Variable		N	Mean	SD
Technology Integration	Never	3	3.63	.208
	1 – 3 times	51	3.68	.533
	4 – 6 times	29	3.61	.482
	More than 6 times	17	4.12	.420
Total		100	3.73	.520

DISCUSSION

The Primary School Standard Curriculum (KSSR) and the Secondary School Standard Curriculum (KSSM) were implemented in 2014 with the goal of enabling students to acquire the abilities needed in the twenty-first century in order to compete in the future. This project also aims to assist teachers in comprehending and preparing for changes in their teaching processes in order to make them more toward student-centred approach. According to Embi (2016), teachers should equip themselves in a variety of ways to meet the 21st century's learning needs, including ICT skills. This is in line with the findings of this study where the skills level of the Science teachers is at a high level and this shows that teachers are ready to implement 21st century learning using the technology with confidence.

The findings of this study showed that the average mean score obtained is 3.73, which was at a high level that teachers are prepared in terms of skills. The findings of this study have similarities with the findings of a study conducted by Tajudin and Abdullah (2018) in relation to the readiness of primary school teachers from other states. This directly proved that teachers are prepared from the aspect of their technology integration skills and confidence about the skills they have in the implementation of 21st century learning.

The analysis of the study showed that there was no significant difference in mean scores based on gender. This result confirmed that there should be no gender differences among teachers in mastering the technologies in this 21st century. Teachers should consider the best way to give a lesson in the classroom. Regardless of whether they are male or female teachers, the primary goal of teachers in the classroom is to transfer knowledge. In order to teach students, the concept that gender plays a role in information transmission should be avoided (Tikok, 2018).

However, when the number of courses taken was analysed using a one-way ANOVA test, significant mean score differences were detected. The study found that teachers who attended the course more than 6 times had a significant difference from those who only attended 1-3 times and those who attended 4-6 times. Hamzah and Sirat (2018) conclude that there is a significant difference in the frequency of attending training on the implementation of in-service training, which supports the conclusions of the study. Furthermore, according to Jamil (2008), the more frequent the teachers attend training, the more exposure teachers have to the knowledge and skills that are required in their professional development. This also shows that the number of courses taken has an impact on teachers' level of comprehension on technology integration relates to the implementation of 21st century learning.

CONCLUSION

The findings of this study showed that teachers' skills are crucial in adopting 21st century learning. As it is known, teaching is a teacher's primary responsibility. Teaching is more than just giving material to students; it is also about implementing curriculum content to students by utilising the skills accessible to a teacher in order to achieve 21st century learning goals. As a result, teachers should work harder to improve their existing skills so that they can better support students in mastering the skills of cooperation, communication, creativity, and critical thinking.

The implication of the study revealed that Science teachers have some form of readiness from the aspect of technology integration skills in the implementation of 21st-century learning. However, this study has some limitations. The first is in terms of the number of respondents; it

is only done on a small scale. The second is about the area where it is only done in secondary schools in urban areas. It is suggested that further studies could be expanded to the rural secondary schools to obtain more precise information on the skill readiness of Science teachers in the implementation of this 21st-century learning.

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EFL LEARNERS' PERCEPTIONS OF THE IMPACT OF LEARNING MANAGEMENT SYSTEM ON LEARNER AUTONOMY IN VIETNAM

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ABSTRACT

In the educational context, the increasing interest in the hybrid learning method combining both traditional face-to-face classroom and online activities (Pishva et al., 2010) has given rise to different e-learning platforms, among which, a Learning Management System (LMS) which is one of the most commonly used tools to supplement conventional lectures. In order to investigate the impact of an LMS on EFL learner autonomy, the current study was conducted at a university in Central Vietnam. Twenty-five students randomly selected from a faculty were invited to participate in focus group interviews to elicit qualitative data regarding their perceptions on the effect of the LMS on their autonomous learning. The findings indicate that the EFL learners in this study seem to be aware of the positive impact of the LMS on their autonomous learning, which can be shown by the fact that they can initiate, monitor and evaluate their learning process. Some implications for instructors were also proposed to enhance the support of the LMS for EFL learners.
Keyword: platform, Learning Management System (LMS), learner autonomy

INTRODUCTION

Over the past few decades, rapid technological innovations and advancements have paved the way for new foreign language teaching and learning approaches, particularly blended learning in university settings. In the educational context, the increasing interest in such hybrid learning method combining both traditional face-to-face classroom and online activities (Pishva et al., 2010) has given rise to different e-learning platforms. Learning Management System (LMS) is one of the most commonly used tools to supplement conventional lectures. The role of this platform has been strongly underscored during the severe Covid-19 pandemic when many countries have closed schools and higher institutions to contain the spread of the virus. In addition, it is during the coronavirus crisis that a majority of students have displayed substantial potential to act as autonomous learners (Hidayati & Husna, 2020). That is to say, students have been encouraged and required to develop their autonomy as well as ability to engage themselves in online learning through a wide array of mobile applications and learning management platforms.

In Vietnam, different LMS software applications have become dominant, especially in higher institutions and have proven to be of great use regarding school / course announcements, course registration, lecture delivery, exam revision, assignment submissions and forum discussions. Some of the popular systems include Smas, Mi, Eschool, Vietschool, Blackboard and Edusoft (Nguyen, 2020), to name just a few, all of which have allowed the teaching and learning process to take place in a digital environment. Regardless of the fact that the Covid-19 outbreak has brought significant disruptions to education across the country, some

universities optimistically consider this ample opportunity to promote the digitalization of learning materials and the investment in ICT infrastructure and the training of human resources to transform the conventional teaching and learning approaches.

Like other similar East Asian countries, Vietnamese learners are deeply influenced by Confucian-value heritages (Nguyen, 2015) and thus, a typical classroom structure, even for foreign language learning is rigidly hierarchical regarding teacher-student relationship (Le, 1999). According to Dang (2010), although learners have traditionally been known for laborious and hard study, they are often regarded as passive learners who depend almost entirely on teachers, i.e. always trying to listen attentively to the lectures, taking notes and then replicating their memorized knowledge in exams. Moreover, there still exist some other problematic issues in the context of EFL teaching and learning such as large class sizes, shortage of resources and conventional teaching methods (Phan, 2013; Tran, 2013). Therefore, when it comes to supportive factors for autonomous learning like freedom, choices and negotiation (Dang, 2010), it appears to be rather challenging for EFL learners in Vietnam, even at a university level. Nevertheless, together with dramatic innovations in education, learner autonomy has recently captured special attention in this nation. This was represented in national policies on university education reform focusing on "the renovation of undergraduate from year-based to credit-based, renovation of teaching methods orienting towards developing the positiveness, self-awareness activeness, creativity and self-study ability of learners, and enhancement of foreign language (English language) education" (Hoang, 2017, p. 3) to improve the learner proficiency, meet the demand for industrialization, modernization and international integration of the country. Such policy can be considered as a favourable condition for research to develop learner autonomy in the educational context in Vietnam.

In fact, a plethora of research has been undertaken with regard to the possible impacts of technological tools or the integration of LMS into courses at tertiary level on EFL teaching and learning. There are also a number of studies which have been implemented to investigate the issue of learner autonomy and suggestions to improve this ability. However, very few researchers have focused their attention on the relationship between LMS and learner autonomy, which means that it has not yet been established whether LMS has any impacts on autonomous learning. Moreover, according to Dang (2010), despite LMSs enjoying widespread use in higher institutions, the tools have not been exploited to their fullest by instructors probably because they have not been completely aware of its ultimate strengths in incorporating them into course activities. In Vietnam, although both LMS and learner autonomy have become topics of interest in recent years, there has been little discussion on LMS as a mediator for students' self-directed learning, except for a study conducted by Dang in 2010. Therefore, this present paper aims to investigate EFL learners' perceptions on the impact of LMS on their autonomy and some factors helping facilitate this process. To fulfill these aims, a research question needs to be addressed: What are EFL learners' perceptions of the impact of the LMS on learner autonomy?

LITERATURE REVIEW

LMS in Education

In recent years, with the rapid advancement of developing technologies, the integration of information and communication technologies (ICT) has increasingly drawn educators' attention (Wang, 2008). By integrating the e-learning technologies into course offerings, conventional classroom techniques of course deliveries have been remarkably transformed (Bottino and

Robotti, 2007; Stokes, 1999; Sutherland et al., 2004). Learning management system (LMS) is software for delivering, tracking and managing training. According to Carmichael (2019), LMS is defined as "teaching and learning environments where participants can interact, communicate, view and discuss presentations, and engage with learning resources while working in groups, all in an online setting". Most of LMSs are web-based to facilitate access to learning content and administration. According to Vovides et al. (2007), an effective LMS incorporates a variety of functionalities that can provide learners with extensive scaffolding and help transform them into self-regulated learners. An LMS can bring multiple advantages consisting of increased availability, quick feedback, improve two-way interactions, tracking and building skills (Bradford et al., 2007).

In a digital era, the learning process has become more diverse, dynamic, and complicated. Thus, with the incorporation of interactive materials, LMSs can support instructors particularly regarding the implementation of non-linear learning design. This offers plenty of potential to transfer online course design from teacher-centered to student-centered pedagogies and to allow learners more opportunities to choose and explore their own learning path. Herse and Lee (2005) also share this view claiming that an LMS "can be used as a catalyst for self-reflection and to help facilitate change from passive to active learning" (p.51). Similarly, Lonn and Teasley (2009) also stated that the instructor plays a key role in facilitating learning interactions, engagement and promoting deeper and meaningful learning experience among learners. To explore students' online learning experience and its benefits regarding the use of various features on an LMS, Tseng (2020) categorized different LMS dimensions into three groups including Content, Communication and Evaluation together with their teaching techniques, practices and particular technological tools. For instance, as for the Communication aspect, announcements, instant messaging, discussion board as well as video messages and comments provide dynamic communication channels between learners and the instructor. Some techniques or practices can be adopted such as providing students a variety of ways to communicate and interact to help build a sense of community and foster group cohesion among students or the instructor involving in discussion activities to enhance social presence and improve their learners' metacognition.

Learner Autonomy

Since learner autonomy has been considered to be one of the ultimate goals of the educational process for a long time (Benson, 2001, 2009; Waterhouse, 1990), there have been a number of definitions of this issue. It is the willingness and capacity to "act independently and in cooperation with others as a socially responsible person" for one's learning (Dam, 2003, p. 137) and to transform in a deliberate and flexible way between behaviours driven by individuals and groups to meet their needs (Lewis, 2014). Learner autonomy can also be defined as the freedom learners are offered and their ability to turn contextual constraints into affordances for autonomous action (Benson, 2011; Lewis et al., 2017). Learner autonomy also necessitates the active involvement, reflection and appropriate target language use of learners (Little, 2004). Therefore,–learners must be responsible for their own learning process and its outcomes. In addition, learner autonomy has also been evidenced to be dramatically related to several supportive factors such as high motivation, willingness to communicate and self-efficacy, which determine the language learning success both in English as a second language (ESL) and in English as a Foreign Language (EFL) (Dickinson, 1995; Little, 1990).

As learner autonomy is interpreted in diverse ways, different models / frameworks have been suggested in the literature. These can include models of learner autonomy concerning

stages of development initiated by Nunan (1997) consisting of awareness, involvement, intervention, creation and transcendence. Nevertheless, this model can be regarded as irrelevant under certain circumstances (Dang, 2012). Littlewood (1999) proposed a two-level self-regulation process including reactive and proactive autonomy. After that, a simplified version of Nunan's model (1997) was put forward by Scharle and Szabo (2000) who claimed that learner autonomy is a three-stage process involving raising awareness, changing attitudes and transferring roles. However, according to Dang (2010), these theoretical models have "challenged assumptions of the non-linear development of learner autonomy" (p. 55). Therefore, several researchers (Littlewood, 1996; Macaro, 1997, 2008; Benson, 2001) have constructed other models of learner autonomy relating to areas of control that have been claimed to bear some similarities on account of the interrelated nature of their components.

The current study employed a framework of learner autonomy synthesized from previous models by Dang and Robertson (2010). Using thematic analysis, they categorized different dimensions of learner autonomy into three kinds of processing including initiating, monitoring and evaluating learning. According to Dang and Robertson (2010), the initiating learning process includes attributes regarding the understanding of personal learning preferences, goal setting, study plan preparation and the creation of learning opportunities. The process of monitoring learning is comprised of learning engagement and maintenance while the evaluating process involves the assessment of learning outcomes. These processes may operate sequentially or simultaneously during students' learning (Figure 1).

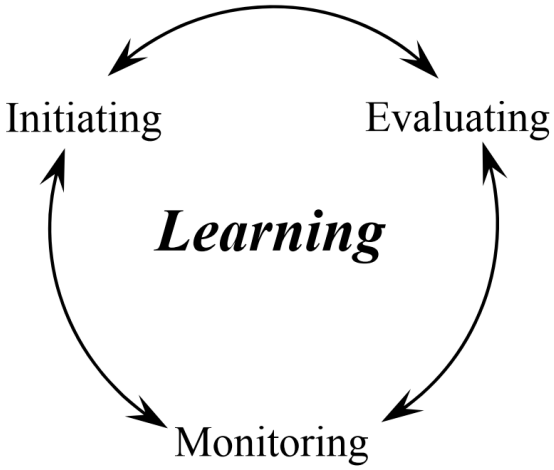

Figure 1: The cyclic relationship of the three intertwined processes of learner autonomy (adapted from Dang & Robertson, 2010)

LMS and Learner Autonomy in Language Learning

Technology has become an essential part of the discourse on autonomy in the field of language education in the 1970s and their relationship can be considered dynamic since autonomy affects learners' perceptions of the role of technology in relation to language learning and vice versa, the influence of technology on the practice and improvement of learner autonomy. In recent years, there is a vast amount of literature on the interaction of technology and autonomy in both formal and informal learning contexts with the goal of supporting the development of learning autonomy with technology in their respective contexts. As one of the most widely used technological tools, LMSs have also been receiving much attention; however, the impact of

LMSs on learners' autonomy, particularly in the field of foreign language learning has not been fully investigated. In Vietnam, there seems to be very few studies into this issue, except for the one implemented by Dang and Robertson in 2010. Their research examines Vietnamese students' perspectives on socializing and academic activities as well as the relationship between them. Some practical suggestions for EFL teaching practices with the incorporation of the LMS are also proposed in this study.

METHOD AND SAMPLING

In this current study, a qualitative method, specifically, semi-structured interview was mainly employed because this method attempts to investigate the everyday life of various groups of people and communities in their natural setting and make sense of, or explain phenomena regarding the meaning people bring to them (Denzin & Lincoln, 2003). Moreover, according to Myers (2009), "qualitative research is designed to help researchers understand people and the social and cultural contexts within which they live". The system through which qualitative data are retrieved is considered to be unique, which makes qualitative research well-suited for giving actual and descriptive data (Johnson & Christensen, 2012). For the current study, focus group interview was used as the design with qualitative analysis for data interpretation. This method involves group discussion of a small number of participants in an informal setting which focuses on a particular issue / problem (Wilkinson & Silverman, 2004). The research chose this instrument because this can create an amicable atmosphere in which the students can feel comfortable and relaxed to share their opinions. Moreover, focus group interviews can enable the researcher to elicit data from more people but save a great deal of time.

The study was conducted at the Faculty of Foreign Language Teacher Education (FLTE), the University of Foreign Language Studies (UFLS) which is located in Central Vietnam. 25 students of the English Language Teaching Division were randomly selected for the interview. They were divided into five groups for an interview arranged at a time convenient for all of them. These participants have been familiar with the school's LMS since the first semester of their program and they have to engage themselves with different functions of the LMS in almost every course at the university. Therefore, during the Covid-19 crisis, the students experience a relatively smooth transition to the school's online learning systems, including the LMS.

In terms of analysing data gathered from the interviews, the responses were audio-recorded with the interviewees' permission. After having all of the responses transcribed, the semantic content analysis (SCA) was employed to analyze the answers of participants. SCA allows researchers to quantify and research the words that speakers use to express themselves (Roberts, 1997; West, 1997). Because semantic choices have been demonstrated to reflect speakers' underlying cognitive and affective processes, researchers have used SCA to identify individual differences between speakers along psychological dimensions (Duriau et al., 2007). SCA can help interpret the structures of discourse and build insights and evidence when doing qualitative research. Therefore, in this thesis, SCA was employed to analyze the impact of the LMS on different learner autonomy dimensions.

FINDINGS AND DISCUSSION

The LMS used in the current research was to support the learners throughout different courses of the program in a variety of ways from task accomplishment to knowledge exchange and evaluation. Based on their responses, thematic analysis indicated that the students' perceptions

of the benefits of the LMS on their autonomous learning can be categorized into three dimensions including ability to initiate, monitor and evaluate the learning process.

Ability to Initiate Learning Process

The LMS enabled almost all students to take active roles in participating in the learning process. Out of twenty-five students who took part in the interview, nineteen participants said that they logged onto the LMS almost every day; the other students admitted that their frequency of accessing the LMS is around three or four times per week mainly because they had to deal with assignments or group work as required for most of the courses.

Students said that they often had access to the LMS because they wanted to get updates on the latest information related to the courses from their classmates and teachers.

> *"To be honest, in the beginning, I was just curious whether there were any interesting or useful things there on the LMS. But then, I recognized so many posts were put up, which caused me to sign in to the class or the course more frequently" (S1)*
> *"When the course was integrated with the LMS, I would have to do more assignments, so I needed to read and did more research into more materials carefully. That was why I took part in the LMS- integrated courses more often." (S3)*

Furthermore, the posts or discussion forums on the LMS stimulated students to participate in the learning process. Eighteen students added that many topics posted on the system by their teachers or friends made them interested and wanted to know more relevant information.

> *"During the course of English Writing Skills C1.2, instructors often created individual or group discussions on the LMS so that my classmates could share tips or strategies or experience to write a complete VSTEP Writing. Therefore, we could learn and share with each other advanced vocabulary, complex sentence structures. This fuelled my interest in writing. Although this was a difficult skill, thanks to active exchanges in online discussions, I have been able to be more confident in my writing ability." (S6)*
> *"I was very active on the LMS, and I often created discussions to share my ideas with my classmates." (S13)*
> *"When I had access to some interesting resources or topics on the LMS, I downloaded them to my computer so I could learn more and sent them to my friends." (S19)*

However, some others supposed that:

> *"I didn't participate in discussions very often. I only did it when the teacher requested. However, if I found out interesting academic material on the LMS, I would download it immediately." (S5)*
> *"I only participate in teacher-created discussions, and didn't create any discussions on the LMS. However, if I saw any good documents from my friends, I would read and take notes if necessary." (S14)*

That means although the LMS stimulated students to engage in the learning process, it also depended on their learning attitude. Students who participated with interest and with a positive attitude often accessed the system more often than those who did not actively study on the LMS. In addition, the LMS also contributed to boosting interaction and communication between students:

> *"When I received replies from my friends about my post, I felt very happy. They helped me know more about what I should do to promote and improve myself. Then I would try to remember their names and knew more about them in other discussions on the LMS as well as in the real life." (S18)*
> *"Thanks to the anonymous function of the system, I felt more confident in communicating and expressing opinions with people during online learning." (S22)*

What engaged the learners the most to the LMS was the content shared by their peers and instructors on this platform. They believed that most of the posts were useful and related to the academic knowledge of the courses, which was the main reason for their high frequency of visits to the website. Despite the fact that a few of them logged onto the LMS when required by the teachers, it cannot be denied the fact that such expectations from the teachers would gradually increase their learners' online habit for knowledge and ideas exchange, contributing to improving their performance. This is in line with the findings of Dang and Robertson (2010) who also indicated that the quality of contributed content was the most significant factor attracting the learners' attention and facilitating communication between them.

Ability to Monitor Learning Process

As the participants' responses revealed, most of them logged into the LMS almost every day and the common reason was that they were aware that completing tasks on the LMS was also part of the course assessment, they regularly checked up this system "*to make sure they didn't miss any latest information or assignments from teachers and classmates*" (S1). However, the six remaining students said that their frequency of monitoring learning progress on the LMS depended on the requirements of the course. If the course was not too important for them, they would not check-in or update information that often. This proved that monitoring the process of learning on the LMS also depended on the learning consciousness of each student.

In addition, the LMS was considered to help learners monitor their learning process more effectively through different functions such as "Calendar", "Timeline", "Events", Upcoming Events", or "Private Files".

> *"The platform allowed me to put a tick to confirm when a task has been completed. The system also updated me knowing what percentage of the course assignments I have accomplished. This has been very functional for me to track my progress."* (S24)
> *"The 'Calendar' section on the LMS automatically updated to remind us how many assignments needed to be completed and when they had to be submitted. Hence, we could plan to complete the task on time." (S17)*

Moreover, the LMS gave the students a great deal of flexibility in terms of time and places.

"I can choose anytime I want to log in and do the tasks on there. There are quite a lot of exercises that I have to deal with for every course." (S14)
"I actually prefer to manage my learning in my own way, I mean, sometimes I enjoy studying at home, working on the assignments on the LMS, which is much more convenient for me". (S22)

In addition, the LMS was also deemed to make communication between teachers and learners easier.

"The LMS provided us with additional useful materials related to the lessons. In classroom sessions, sometimes the teacher wanted to show us further interesting videos or materials but time is limited. Nevertheless, thanks to the appearance of the LMS, teachers could easily share them and I could refer to them in my spare time. Besides, I thought that the LMS also made it easier for teachers and learners to stay in touch." (S8)

The LMS has offered the students different functions enabling them to monitor their learning process better and the learners appear to be satisfied with these applications. This shows that learners are active and responsible for their learning because they should be the center of their learning process. Therefore, it is very important that the instructors should design sufficient amount of assignments on the LMS which are engaging and relevant for the learners, which can promote their self-study a great deal.

Ability to Evaluate Learning Process

All of the participants agreed that the LMS activities offered them an enormous opportunity to evaluate themselves.

"Whenever submitting an assignment on the LMS, after a short period of time, the teacher would grade and update the score on the system with his/her comments or feedback. This really helped me know what my strengths are and what I needed to ameliorate. Additionally, this score was only shown to me, so if I got a low score, I wouldn't be embarrassed to my classmates." (S2)

Besides, there are 16 students who conceded that the LMS also allowed them to know more about their friends' abilities.

"When I participated in discussions or through the posts that my friends shared on the LMS, I could somewhat understand their abilities or qualifications. There were some participants who have some very short response to general topics, with occasional errors in spelling and structure. However, there were people who gave very long and informative responses, the evidence was clear and reasonable, and when we read it, we could learn a lot more." (S10)
"There were some students in the class who did not talk much, but on the LMS, they are very active to share many interesting and useful posts. That gave me a different evaluation on these students." (S1)

"I can compare my answers with friends, and if I realize that I have something missing in my exercises or find several interesting sharings, I often take notes to learn in the future." (S15)

The students gave different evaluations to their peers showing that they became active in reflecting and evaluating on the contents, the threads as well as the discussions. Although these comments of evaluation could be rather subjective, they were necessary regarding allowing them to assess their own learning and gaining a better understanding of the capabilities of their peers. Therefore, the learners could find appropriate strategies to improve their learning progress.

However, the other nine demonstrated that using LMS participation for assessment purposes was not always precise.

"I think a posting probably made some mistakes but the reason is because they did not check it carefully. This can be annoying sometimes."
"I knew there were some learners who obtained great accomplishments in class in spite of not uploading lots of postings on LMS and attending the online courses often. Therefore, it was not quite satisfactory to evaluate their ability based on performance on the LMS only" (S5)

From the interview results above, although the LMS offered students plenty of opportunity and means to evaluate their own learning or that of others in the classroom, through the comments or scores which were updated on the LMS; however, due to some external factors, using the LMS as a means of assessment was not always accurate. This can be consistent with the result of the research conducted Song and Hill (2007) as it revealed that the way of reacting to peers' comments might be an obstacle because learners are more likely to doubt the validity of peers' knowledge.

CONCLUSION

In general, the EFL learners in this study seem to be aware of the positive impact of the LMS on their autonomous learning, which can be shown by the fact that they can initiate, monitor and evaluate their learning process. Comparing with results found by Dang and Robertson (2010), it can be stated that the relationship between the system and the ELF learner autonomy in the Vietnamese context is interwoven and cyclical of the three abilities. Based on the findings, some implications should be proposed for the instructors concerning the course contents as well as the assignment of the subject to engage them in the learning process more effectively. However, some limitations can be identified from the current research, especially in terms of the small sample size and the shyness and passiveness of some participants. Therefore, further studies could be implemented in a larger scale to depict more aspects of learner autonomy with the support of different LMSs in the field of EFL teaching and learning.

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USE OF QUIZLET OUTSIDE CLASS IN ENHANCING ESFL LEARNERS' VOCABULARY LEARNING: A CASE STUDY

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ABSTRACT

Quizlet, one of the applications of Mobile assisted language learning (MALL) is a free tool to learn vocabulary, concepts, and terminology through flashcards and fun games to help learners remember easily and remember for a long time. This study aims at investigating the use of the Quizlet outside classroom to improve the English vocabulary learning capacity for 11th grade students at Hoang Hoa Tham Upper Secondary School - Danang city, Vietnam. The research employed a mixed study method using quantitative and qualitative data. The quantitative data were gathered from vocabulary tests involving 81 students and questionnaires, while the qualitative data were collected through interviews with 10 students. The results showed that Quizlet changed the vocabulary scores significantly compared to traditional methods. Most student participants agree that Quizlet is a useful tool for learning new vocabulary. In addition, it is also suggested that students should use a combination of traditional methods and Quizlet to gain the best results. Regardless of students' perceptions, Quizlet encouraged them to learn vocabulary at great frequency. They also indicated that they had high emotional engagement in using Quizlet. Quizlet was user-friendly and helped them to learn vocabulary fast. Therefore, students can use Quizlet as a useful tool in learning English vocabulary and improving their vocabulary memorization.
Keyword: Quizlet, vocabulary, vocabulary learning capacity, memorization, 11th grade students

INTRODUCTION

English is widely used as an international language all over the world. Therefore, learning English and especially learning English vocabulary has become indispensable for all learners of English as a second or foreign language (ESFL). Without a wide range of vocabulary, it is difficult for learners to communicate or even express themselves properly. However, many students claimed that it is difficult for them to remember and retain the English vocabulary they have learned. At present, there exist some traditional ways for learners to enhance and review the vocabulary acquired such as multiple-choice questions, blank-filling, and cloze on worksheets, but students are less motivated. They are also shy to ask questions to clarify the meaning of words or phrases they are not sure of. It is boring for students to do vocabulary worksheets. For these reasons, there has been a long debate about the best methods for vocabulary instructions and various suggestions concerning vocabulary learning were posed. In this setting, Mobile assisted language learning (MALL) might be a promising choice. Quizlet, one of the applications of MALL, has recently, been designed for learning vocabulary. Created in 2005, Quizlet comes with a great deal of features that can help teachers to organize their

classes and help students to learn vocabulary more easily. This study was conducted as a case study to examine the use of the Quizlet outside classroom to learn English vocabulary by a group of 11 graders at Hoang Hoa Tham Upper Secondary School - Danang city, Vietnam (sourced from Hoang et al. 2014). At the same time, another 11-grader group learnt English vocabulary with the same material provided by the researchers in their normal way. The study findings were hoped to answer the question of whether Quizlet applied to vocabulary learning created better results for the ESFL learners than the normal way of vocabulary study did.

LITERATURE REVIEW

What to learn when learning vocabulary

According to Doff (1988, p.11), teachers must be aware of three key aspects when teaching new vocabulary namely the form, the meaning, and use. Therefore, these are what any ESFL learners should focus on. Nation (2001, p.40-47) defined a word's form as its pronunciation (spoken form), spelling (written form), and any word parts that comprise this specific item (such as a prefix, root, and suffix). Also for Nation (2001, p.47-49), meaning encompasses the way form and meaning interact, in other words, the concept and what items it refers to, as well as the associations that come to mind when people think about a specific word or expression. Nation characterized use as "the grammatical functions of the word or phrase, the collocations that normally accompany it, and any constraints on its use, in terms of frequency, level, and so on."

Importance of vocabulary learning

Vocabulary plays a key part in communication. While knowing only a few words may be helpful in some situations, it is said people must understand as much as 98% of a text so as to get an acceptable understanding of that text (Hsueh-Chao & Nation, 2000).

Mobile Assisted Language Learning

Mobile assisted language learning (MALL) is the subsector of the developing field of mobile learning and the way learners make use of mobile technology in learning a language. If a learner takes up MALL, they do not have to sit in a classroom or use a computer to get access to learning materials. MALL is one of the most suitable means for a learner to learn a language since it can solve the problems caused by time and place. Thanks to these advantages in language learning, Quizlet, one application of MALL was chosen to enhance the learner's vocabulary learning outside the classroom in this study.

Quizlet

Quizlet is an online study application that uses gamification on learning. It is a free tool to learn vocabulary through flashcards and interesting games. In addition to learning on computers by going to quizlet.com (Quizlet supports many languages, including Vietnamese), learners can also download applications on iOS and Android devices. There are 8 learning modes on the website and 5 learning modes on the mobile app. Table 1 below describes the learning modes of Quizlet on the mobile app.

Table 9: Description of quizlet learning modes available on mobile app

Mobile application (Android & iOS)	Description
Flashcards	The study mode provides users with Quizlet flashcards (i.e., digital flashcards), which are basically similar to paper ones.
Learn	In the study mode, the user answers questions about written forms and meanings of target words. They are flashcards, multiple-choice and short-answer questions. Right after he or she gives an answer, they are informed whether it is right or wrong.
Write	The study mode provides the user with short-answer questions about written forms or Vietnamese translations of target words. Right after he or she gives an answer, they are informed whether the answer is right or wrong. Written output is required in the mode.
Spell	When using Spell, the user listens to a target word provided with its translation. Then, they have to type it. Right after the user answers any question, he/she will be informed whether the answer is right or wrong. If the user answers any question wrongly, he/she will be provided with the right answer, and have to re-answer the question before moving to the next one.
Test	In the study mode, the learner is able to take a test, which includes multiple-choice, short answer, matching and true/false questions about written forms and meanings of words. Once the user answered all questions, he or she would be given the test result.
Match	When playing Match, the learner races against the clock to drag and drop each vocabulary item on its correct Vietnamese translation. When the user matches the English word with its correct Vietnamese translation, both of them will disappear. In contrast, if he/she make any wrong matching, the word and Vietnamese translation will still exist.

Besides, Quizlet offers users with Play modes namely Match, Gravity and Live. However, just Match is available in applications on iOS and Android devices.

METHOD AND SAMPLING

A combination of different methods was used to gather both quantitative and qualitative data (Dörnyei, 2007). The quantitative data were collected using anonymous tests, while the qualitative data were collected through interviews with students. The vocabulary used in the tests was collected from the Glossary of the textboook Tieng Anh 11 currently used by students in class. While the tests gathered information about the students' knowledge of the vocabulary, the interviews provided information about the students' opinions on learning new vocabulary by using Quizlet.

The participants in the study were 81 11th grade students of Hoang Hoa Tham Upper Secondary School in Da Nang, Vietnam. Those students come from 2 classes (11/1 and 11/3) in which they learn English as a foreign language. Students in class 11/1 learned the vocabulary in their normal way, while those in class 11/3 used Quizlet to learn new vocabulary. These subjects were all asked to do the pre-tests and post-tests. 40 students in class 11/3 were chosen to respond to the questionnaire and 10 out of them were randomly chosen to give responses to the interviews conducted by the researcher.

The research duration was initially planned to last four weeks from March 18th 2021 to April 18th 2021. The pre-tests were done on March 18th 2021, and the students worked with

the vocabulary in their book in the following four weeks. The post-tests were held on April 19th 2021 and supervised by the researcher. The students also responded to a questionnaire at the end of the research to express their perception of using Quizlet as a vocabulary learning tool. Moreover, the qualitative data were gathered by face-to-face interviews.

FINDINGS AND DISCUSSION

Students' perception towards using Quizlet as a vocabulary learning tool

Figure 1 shows the frequency of learning vocabulary with Quizlet outside the classroom while Figure 2 shows the length of the vocabulary learning session with Quizlet outside the classroom.

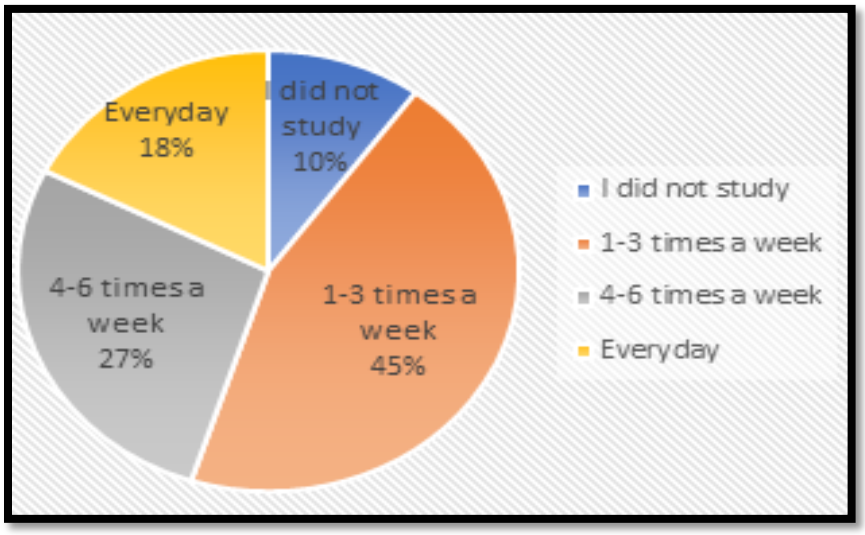

Figure 1: Frequency of learning vocabulary with Quizlet outside the classroom

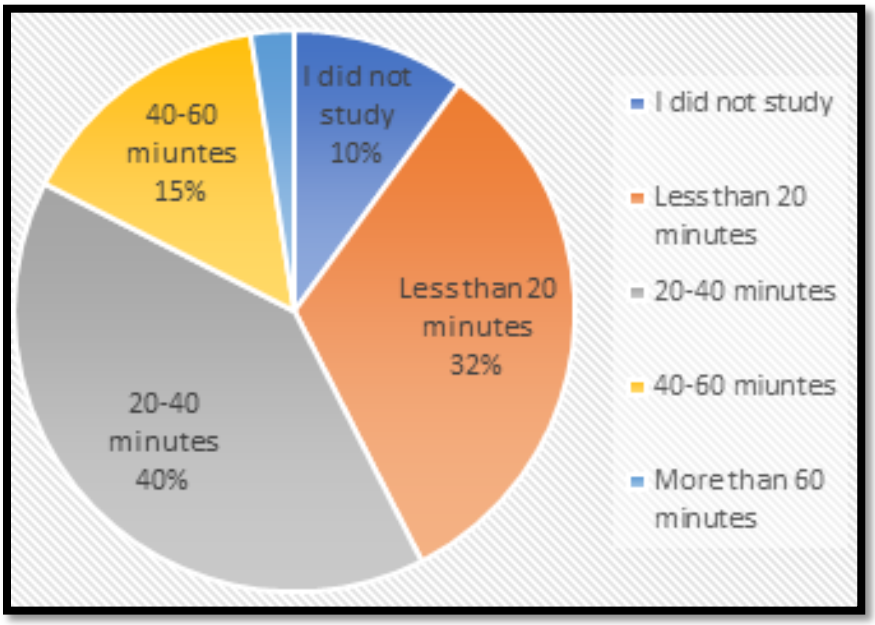

Figure 2: Length of the vocabulary learning session with Quizlet outside the classroom

Table 10: Students' opinions about the usability and usefulness of quizlet

Statements	Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
Quizlet helps me learn English vocabulary quickly.	0%	3%	10%	20%	43%	25%
Quizlet helps me memorize English vocabulary in the longer term.	8%	10%	20%	10%	30%	23%
Using Quizlet helps me improve my English vocabulary.	0%	8%	3%	23%	38%	30%
Learning English vocabulary via Quizlet is enjoyable.	0%	0%	0%	10%	33%	58%
It is easy to use Quizlet to learn English vocabulary.	0%	0%	0%	18%	40%	43%

It can be seen from Table 2 that Quizlet seems to have encouraged participants to learn vocabulary at great frequency and stimulated emotional engagement. Additionally, there were more students who perceived using Quizlet was easy and helped to increase the learning speed. Some students also believed Quizlet supported long-term memorization and development of vocabulary. Lastly, more participants preferred Quizlet to their normal methods. The most frequently mentioned reason for their preference was the tool promoted vocabulary memorization. Furthermore, some students favored Quizlet because of some of its features, which are unavailable in paper flashcards (games and spoken forms of target words). Thus, Quizlet seems to have a great potential in promoting better learning outcomes in educational contexts while maintaining the student's pedagogical motivations.

Comparison of pre-test and post-test results

The results of the pre and post tests were compared. After 1 month, there are differences in the change of average point between the two tests (pre-test and post-test).

Table 11: Comparison of pre-test and post-test results

Class	Average point of Pre-test	Average point of Post-test	Change	Change in percent
11/1	10.8	23	+ 12.2	+ 32.1%
11/3	10.6	26.8	+ 16.2	+ 42.6%

Table 3 shows that while students in class 11/1 who learned vocabulary by normal methods improved by 12.2 point (32.1%), those in class 11/3 improved by 16.2 points (42.6%) as they used Quizlet as a vocabulary learning tool. The results proved the fact that learning vocabulary through Quizlet helps students in class 11/3 improve the average point (from 10.6 to 26.8) which is 10.5% more than class 11/1 whose students used the normal method to learn vocabulary.

Looking at the comparison of the two tests, students in class 11/1 who learned vocabulary by their own normal ways improved their score by 32.1%, students in class 11/3 improved their score by 42.6% as they used Quizlet as a vocabulary learning tool. That the class using Quizlet impoved with 10.5% more than the class using traditional methods implies that using Quizlet is beneficial.

Students who used Quizlet have acquired nearly a half of the words. This task is not an easy one because it contains several complicated words such as *accompany, accomplished,*

*artificial, aspiration, cosmonaut, psychological,…*As 1 point equals 1 word, the students have learned between 1 and 25 of the 38 words that are used in the vocabulary tests.

The students also answered questions about their opinion on learning English and the importance of learning English vocabulary. The students in both classes express that they like learning English more in the post-test than in the pre-test, and they also find it more important to learn new vocabulary in the post-test. This also means that concentrating on vocabulary made the students more highly appreciate the significance of learning English and learning English vocabulary.

As for the test results from the two classes, there is a clear relationship between students' interest in learning English and the importance of learning English vocabulary. In the pre-test, 72.5% of the students say "Yes" to both questions, and the number has risen to 79% in the post-test. Surprisingly, there are some students who are not interested in learning English but still believe learning new vocabulary is important.

To conclude, using Quizlet gives better results to students. In general, two classes have medium scores. The results from the tests are relatively consistent with the results from interview regarding learning English and the importance of vocabulary. There is an indisputable relationship between students' interest in learning English and the importance of learning English vocabulary.

Results of the interviews

The questions for the students revolved around learning English and learning English vocabulary, and what methods students preferred to use when learning vocabulary.

1. Do you think learning English vocabulary is important? Why? Why not?

All students agreed that they must learn new vocabulary and it was very essential. One student believed that it was essential to see connections in the language and that new vocabulary helps him to utilize various terms. Five students mentioned that vocabulary helped them to enhance their commnunicative skills. One student said that it was useful but exhausting to learn vocabulary. One student said "It depends. At times the stuff we read was truly boring and afterward I don't think it's so imperative to get familiar with the new words".

2. Which vocabulary learning methods do you prefer?

Most students thought that repeating the vocabulary and memorizing was the most appropriate strategies. The other two students said that they liked using traditional methods such as rewriting words on paper or repeating words over and over to memorize vocabulary. Five students believed that gaming in general was a good method as it was more interesting for them to learn new vocabulary.

3. Do you prefer using Quizlet or normal methods when learning English vocabulary?

Seven out of ten students said that they liked using Quizlet as a tool to memorize vocabulary quickly. One student said "In my opinion, it's useful to use traditional methods because I can totally focus on my work and then I remember better." Another student said that traditional

methods, like talking, writing the words, reading and looking up words in a dictionary were good ways to learn. The last student said: "I liked to write down new words on my notebook".

4. Is Quizlet an interesting and useful tool for learning vocabulary, and if yes, how?

All students said that Quizlet was very effective for vocabulary learning because it helped them practice vocabulary many different times. Moreover, students thought it was motivating to see how their results improve. They also agreed that when the vocabulary was taught in advance, the learning and memorization process were quicker and easier. Five students said that learning vocabulary with Quizlet was fun and helpful. Two other students said that learning vocabulary using their normal methods was still the most useful method for learning.

5. Do you think learning vocabulary with Quizlet gives you better results?

All students believed that Quizlet would give them better results. However, to gain the best results, they agreed that new vocabulary once memorized should be put into use in contexts.

Difficulties students encountered in the process of using Quizlet

Through the interviews, some typical difficulties in learning vocabulary through the Quizlet have been revealed as follows:

- Quizlet can only help students remember words in isolation. This can make students confused when they see the word again in context. Also, this might negatively influence students' skill of predicting the word meaning while reading a text.
- Using Quizlet in this study means that students have to work with a smartphone. Thus, sitting with Quizlet for a long time might cause health problems such as eye strain and back pain. These health hazards bring students the feeling of discomfort and tiredness which prevent them from being interested in learning with mobile devices.

How to overcome these difficulties

As mentioned above, there are some difficulties resulted from learning vocabulary with Quizlet. However, these difficulties are not too severe to be improved. To make the vocabulary learning process more interesting and useful, students should combine the use of Quizlet tool with contextual vocabulary learning. This helps students not only understand new vocabulary clearly but also memorize the vocabulary longer.

Besides, students should make a plan for themselves when learning vocabulary through Quizlet to ensure their health and effectiveness:

- After learning vocabulary through context, students should use Quizlet to learn and remember words longer.
- Because Quizlet has different learning modes, within 1 week, students can learn vocabulary by changing different modes in turn to create such an innovative learning environment and avoid boredom.
- Students should use Quizlet for 20-30 minutes per day to gain the best results.
- When using smartphones to learn vocabulary, students should pay attention to keep the device at the right distance, sit in the correct posture, adjust the appropriate brightness and avoid working in the dark room.

Based on the results, Quizlet seems to be a more useful tool for learning new vocabulary than traditional methods, but the results may be affected by the long testing period. Students also agree that Quizlet is useful for repeating words that they have already learned, implying that the tool is beneficial when working with vocabulary.

Quizlet is useful with known vocabulary, and that Quizlet is a good aid to normal learning methods. Students should combine the former with the latter to gain the best results.

CONCLUSION

This study was a part of the digital transformation process in teaching and learning ESFL in Vietnam. The aim of this case study was to investigate if using the Quizlet, one of the realizations of MALL, for vocabulary learning in a Hoang Hoa Tham Upper Secondary School makes the learning more effective and motivating than using the normal methods. The following key findings were beneficial for language teachers and learners in their learning and teaching. First, the data collected from tests and interviews suggest that using Quizlet would marginally improve vocabulary learning capacity. Therefore, compared to the normal method, it is an effective tool for learning new vocabulary. It is also acknowledged as a valuable tool for making lessons varied and fun and is motivating to the students. Second, in the process of using Quizlet to learn vocabulary, it is inevitable that students will be confused when they encounter vocabulary in context or related health issues. However, these problems are not so insignificant and can be completely solved. Third, according to the participants' responses to the questionnaire, Quizlet encouraged them to learn vocabulary at great frequency. They also indicated that they had high emotional engagement in using Quizlet. Quizlet was user-friendly and helped them to acquire vocabulary fast. Thus, Quizlet is effective in vocabulary memorization and development (Glotzbach, 2019). Finally, this research made a lot of contributions to the use of Quizlet in learning English vocabulary for ESFL upper secondary students in Viet Nam.

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APPENDICES
PRE-TEST

THE USE OF QUIZLET OUTSIDE CLASS IN ENHANCING ESFL LEARNERS' VOCABULARY LEARNING - A CASE STUDY IN HOANG HOA THAM UPPER SECONDARY SCHOOL IN DANANG

PRE-TEST ON LEARNING VOCABULARY

1. Which class are you in? _____

Question	Yes	No
2. Do you like learning English?		
3. Do you think learning new vocabulary is important?		

Translate the words into Vietnamese:

1	accompany (v)	
2	accomplished (adj)	
3	avid (adj)	
4	continually (adv)	
5	discarded (adj)	
6	fascinating (adj)	
7	fish tank (n)	
8	gigantic (adj)	
9	ignorantly (adv)	
10	indeed (adv)	
11	indulge in	
12	tune (n)	
13	wonder (n)	
14	appoint (v)	
15	artificial (adj)	
16	aspiration (n)	
17	astronaut (n)	
18	bid goodbye	
19	biography (n)	
20	breakthrough (n)	
21	caption (n)	
22	challenge (v) (n)	
23	Congress (N)	
24	conquest (n)	
25	cosmonaut (n)	
26	extreme (adj)	
27	feat (n)	
28	gravity (n)	
29	leap (n)	
30	mission (n)	
31	orbit (n)	
32	pioneer (n)	
33	pressure (n)	
34	psychological (adj)	
35	reminder (n)	
36	shuttle (n)	
37	tragic (adj)	
38	venture (n)	

POST-TEST

THE USE OF QUIZLET OUTSIDE CLASS IN ENHANCING ESFL LEARNERS' VOCABULARY LEARNING - A CASE STUDY IN HOANG HOA THAM UPPER SECONDARY SCHOOL IN DANANG

POST-TEST ON LEARNING VOCABULARY

1. Which class are you in? _____

Question	Yes	No
2. Do you like learning English?		
3. Do you think learning new vocabulary is important?		

4. If you have learned vocabulary by using Quizlet, do you prefer using Quizlet to learn English vocabulary to using traditional methods? Why?

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.....
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Translate the words into Vietnamese:

1	accompany (v)	
2	accomplished (adj)	
3	avid (adj)	
4	continually (adv)	
5	discarded (adj)	
6	fascinating (adj)	
7	fish tank (n)	
8	gigantic (adj)	
9	ignorantly (adv)	
10	indeed (adv)	
11	indulge in	
12	tune (n)	
13	wonder (n)	
14	appoint (v)	
15	artificial (adj)	
16	aspiration (n)	
17	astronaut (n)	
18	bid goodbye	
19	biography (n)	
20	breakthrough (n)	
21	caption (n)	
22	challenge (v) (n)	
23	Congress (N)	
24	conquest (n)	
25	cosmonaut (n)	
26	extreme (adj)	
27	feat (n)	
28	gravity (n)	
29	leap (n)	
30	mission (n)	
31	orbit (n)	
32	pioneer (n)	
33	pressure (n)	
34	psychological (adj)	
35	reminder (n)	
36	shuttle (n)	
37	tragic (adj)	
38	venture (n)	

INTERVIEW QUESTIONS

1. Do you think learning English vocabulary is important? Why? Why not?
2. Which vocabulary learning methods do you prefer?
3. Do you prefer using Quizlet or traditional methods when learning English vocabulary?
4. Is Quizlet an interesting and useful tool for learning vocabulary, and if yes, how?
5. Do you think learning vocabulary with Quizlet gives you better results?
6. Do you have any difficulties in using Quizlet to learn vocabulary? What are they?

QUESTIONNAIRE

STUDENTS' PERCEPTION OF USING QUIZLET AS A VOCABULARY LEARNING TOOL

Question 1: How often do you use quizlet to learn English vocabulary?

A. I did not study.
B. 1-3 times a week.
C. 4-6 times a week.
D. Everyday.

Question 2: On average, how much time do you spend learning English vocabulary with quizlet?

A. I did not study.
B. Less than 20 minutes.
C. 20 – 40 minutes.
D. More than 60 minutes.

Question 3: Read and give your opinion on the following statements.

Statement	Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
Quizlet helps me learn English vocabulary quickly.						
Quizlet helps me memorize English vocabulary in longer term.						
Using Quizlet helps me improve my English vocabulary.						
Learning English vocabulary via Quizlet is enjoyable.						
It is easy to use Quizlet to learn English vocabulary.						

VIETNAMESE SECONDARY TEACHERS' RESPONSES TO EMERGENCY ONLINE TEACHING

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ABSTRACT

Early 2020 witnessed one of the greatest pandemics in the history of human beings. All aspects of life have changed since then. In Vietnam, due to the unexpected pandemic, most schools nationwide have been occasionally closed for up to four months, leading teachers to a new way of teaching: online teaching. This study aimed at investigating how Vietnamese secondary teachers reacted to such a sudden change. The study employed sequential explanatory mixed method with the survey and the in-depth interview as the main instruments. The findings of the study revealed that Vietnamese secondary teachers used a mass variety of ways to maintain their teaching from sending exercises through Zalo and email to online meetings. In light of teachers' view, their remote teaching was not very effective due to a lack of skills and knowledge. It was also found that secondary teachers of English in Vietnam need pedagogical, financial support, and resources to better implement their online teaching. The study recommends that the peer mentoring method and an immediate change in pre-service teacher education should be conducted as an effective way to help teachers overcome their challenges in the new teaching context. In addition, instant financial help from the government should be provided.

Keywords: teacher education, online teaching, peer mentoring

INTRODUCTION

COVID-19 pandemic which began in early 2020 has been seriously changing the world in all aspects. The educational systems worldwide have faced many challenges when there has been an abrupt shift from normal teaching to remote teaching. In Vietnam, schools have been occasionally closed as a solution to prevent the widespread of the Coronavirus. The sudden change in the teaching context requires teachers in general and secondary teachers of English, in particular, to quickly adapt themselves to the new teaching context. This has been the first time in history when online teaching is widely conducted in Vietnam.

The study was conducted in the centre of Vietnam in order to better understanding what secondary teachers of English have done to maintain their teaching in a new context. In addition, the research also provides information on what should be implemented to support teachers in their remote teaching.

LITERATURE REVIEW

New teaching context in Vietnam

Coronavirus pandemic has forced the educational system in Vietnam to experience lots of changes. Remote teaching has been occasionally used when the pandemic has become serious. The sudden change in the mode of teaching results in numerous challenges for both the government and practitioners. Teachers need to maintain their teaching by so-called online teaching. Teachers various ways for their teaching from tools to conduct online meetings like Zoom, MS team or Google Meet to emails, Zalo (Nguyen & Nguyen, 2021).

Previous studies

Recently, lots of studies have captured teachers' response to the COVID-19 pandemic. A recent study in 13 European countries revealed that teachers and students quickly adapted to new changes and a mix of synchronous and asynchronous interaction and assessment methods are currently employed (Tartavulea et al., 2020). Yet, it was also found that such a combination of synchronous and asynchronous interaction and assessment methods is quite limited with tools for online meetings which do not allow much interaction.

Similarly, in Asian countries, online teaching mode has been quickly applied in education. In Sri Lanka, the educational setting has very limited resources with a lack of access to the internet and teaching equipment. Therefore, teachers have to make use of any resources they had to maintain their teaching from tools like Zoom to open access social networks such as Facebook and Zalo (Chandrasinghe et al., 2020). In China, teachers utilised both synchronous and asynchronous online teaching modes to keep their students moving ahead (Gao & Zhang, 2020). In Vietnam, university language lecturers employed both online courses on LMS or MOODLE and online meetings conducted by Zoom, MS Team, and Google Meet for their remote teaching (Nguyen & Nguyen, 2021).

Indeed, there should be further studies on how teachers at different levels react to the sudden change in the teaching mode. In Vietnam, teachers from primary schools to universities have to experience many challenges when conducting sudden remote teaching. Research in this field will provide better insights into what the government can do to support teachers and what teachers themselves do to cope with the situation.

METHODOLOGY

Research questions

The study aimed at answering the following research questions:

1. What did secondary school teachers of English in Vietnam do to maintain their teaching?
2. How effective was online teaching in the view of secondary teachers of English in Vietnam?
3. What kinds of support should be provided?

Research approach

Mixed method with sequential explanatory strategy was selected for the study. In the study, the quantitative phase was conducted and based on information gathered from the quantitative phase, the second phase, the qualitative one was implemented to support and explained data obtained from the first phase.

Instrument

The survey was utilised as the main instrument to gather quantitative data, followed by the in-depth interview. The survey consisted of four main parts. The first part seeks demographic features like genders, and qualifications. The second part is about how ready the teachers were to cope with the abrupt change. The third part of the survey focuses on tools and teaching strategies used; the fourth part answers the question "What support do teachers of English need to have?" and the final part is teachers' own evaluation of their online teaching. In this paper, the information of the third part was employed. The in-depth interview was designed to further explain data from the survey.

Sample population

Invitation to take part in the survey was sent to 180 secondary teachers of English, and 147 of them responded to the invitation. 135 of them were females while 12 of them were males. 27 of them had Master's degrees while the rest had Bachelor's degrees.

Validity and reliability

In order to ensure the validity and reliability of the research is met, a pilot study with 10 teachers was carried out. After the pilot, the items of the survey and the interview were edited for better comprehensibility and better serving the research.

FINDINGS

1. What did secondary school teachers of English in Vietnam do to maintain their teaching?

As shown from the survey, secondary teachers of English in Vietnam used various ways to maintain their teaching. 39.5% made use of virtual classes (Google Classroom, Blackboard, Moodle, etc.); 38% used online meeting (Zoom, Google Meet, Messenger, MS Team); and 23% used social media (Facebook or Zalo) for online teaching.

Ten teachers interviewed responded that in the first time of closure, their schools just required them to maintain their teaching in any way they could. They utilized what tools they knew to help their pupils review lessons. Seven out of ten teachers replied that they sent documents or exercises to pupils through email or Zalo. The rest used online meetings with Zoom.

> "*Q: What did you do to maintain your teaching during lockdown?*
> *A: I sent exercises to my pupils using Zalo group.*
> *Q: Did your school require you to use specific tools/ platform for virtual classes or online teaching?*
> *A; During the first time of COVID-19 outbreak, we just used what we had. But later on, we were trained to use Zoom for online meetings. Yet, just a few teachers can organise online meetings because they lack IT skills and we teach in the countryside, our pupils do not have conditions for that (online meetings).Luckily, we can organise some activities on VinEDU.*
> (Interview with Teacher 2)

In the second, third, and fourth times of school closure, secondary schools had better preparation and experience. In Vietnam, VinEdu was widely used in 57 provinces for nearly 3 million pupils in 2018. Yet, before the COVID 19, VinEdu had been used as a tool for schools to communicate with parents though it has other functions such as assigning exercises to pupils, sharing information, and so on. Currently, VinEdu can be used as a platform where schools can organise virtual classes for their pupils In some cities like Danang city, the second semester final exams were conducted online on VinEdu.

2. How effective was online teaching in the view of secondary teachers of English in Vietnam?

Only 27.2% of the secondary teachers of English thought that their remote teaching was effective while 46.3% had no idea. 17.7% disagreed that their online teaching was effective. As opposed to 6.8% of teachers who strongly believed that their remote teaching was efficient, 2% of those surveyed responded that they strongly disagreed with the statement that their remote teaching was effective.

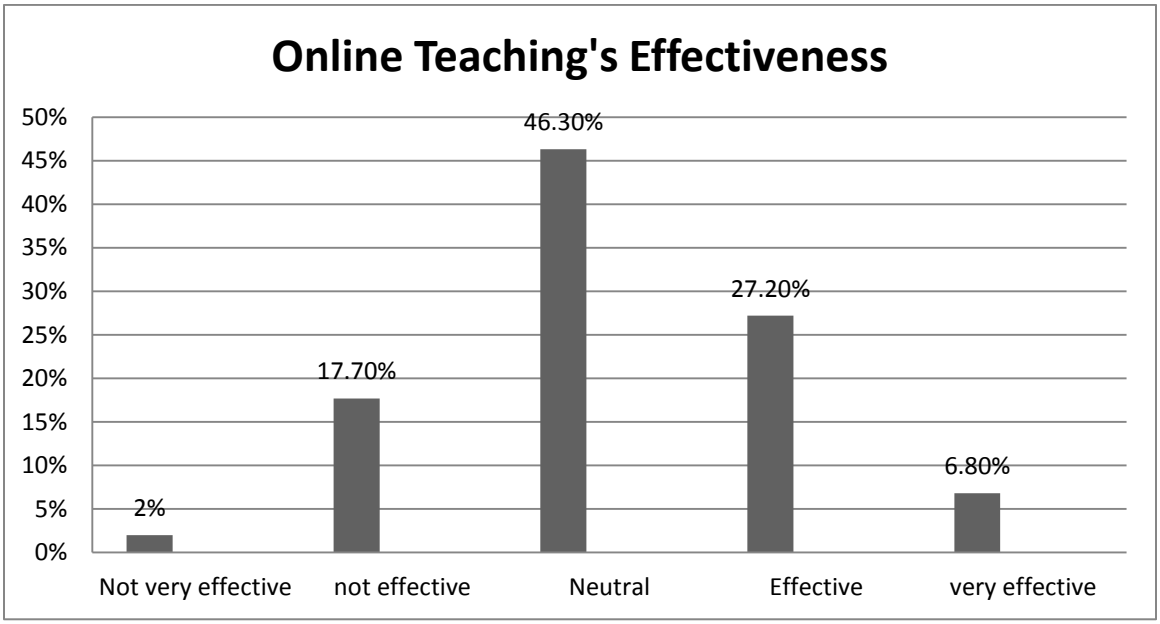

Figure 1: Online Teaching's Effectiveness in View of Secondary teachers of English

Further explanations were obtained from the interview. When asked about why nearly half of the secondary teachers of English had neutral ideas about the effectiveness of their online teaching, all ten teachers shared very similar ideas that the time for online teaching was from 1 to 2 months, so they could not estimate the effectiveness of their teaching. In addition, the purpose of their online teaching was to keep their pupils not forgetting their knowledge and getting on well with their study when everything returned normal. After the time of closure, teachers were required to arrange time to backup their pupils' knowledge; therefore, it is quite hard for them to evaluate how effective their remote teaching is.

The effectiveness of online teaching was also revealed through teachers' responses to the item "How useful was your online teaching?". 27.9% of teachers thought their online teaching was not very useful for their pupils while 32% supposed their remote teaching was very useful for their pupils. 20.1% had no idea, and 20% believed that it was useful.

Interestingly, as shown from the survey, reasons for the unusefulness and ineffectiveness comes from pupils' learning condition and teaching conditions rather than online lessons. In teachers' views, their pupils do not have computers and even smartphones for learning. Learning online is quite difficult if pupils use smartphones that do not have enough functions for online learning. In addition, according to 20% of teachers surveyed, their pupils live in rural and mountainous areas where internet connection is of low quality. Besides, fees for internet connection are a burden for poor families.

Another reason for the ineffectiveness of online teaching and learning is that designing an online lesson takes much time. The sudden switch from normal teaching to online one forced teachers to react quickly, so it was a challenge for secondary teachers of English to arrange a time for an efficient online lesson. Less motivation for online learning was also listed as a reason. Pupils at secondary schools are used to interesting offline English lessons, so they found it less motivated when taking online lessons in which real interactions are limited.

Lack of skills and knowledge also prevents secondary teachers of English from delivering effective online lessons. 30% of participants listed knowledge and skills as reasons for their ineffective online teaching. The sudden change to online teaching mode made secondary teachers of English unable to equip themselves with enough skills and knowledge for online teaching even though 100% of them took part in "Technology in Education" training organised for teachers of English in the National Language Project 2020.

When being asked why online teaching is inefficient, interviewed teachers suggested similar reasons.

> *"Q: As revealed from the survey, the online teaching was ineffective. What's your opinion?*
> *A: In my opinion, there are many reasons for that, but in my school, not all pupils have equipment for online learning and internet connection is not stable. Ah, we do not have enough IT skills and pedagogical knowledge for that.*
> *Q: Have you participated in "Technology in Education" training course?*
> *A: Yes, most of my colleagues had chances to attend this course. But, the course taught us how to integrate technology in education in normal situation, and we did not learn about tools to deliver online meetings like Zoom or Google Meet. I have to learn myself and just know how to use Zoom a little."*
> (Interview with Teacher 4)

It can be concluded that the online teaching implemented by secondary teachers of English is not effective due to various factors from both teachers and pupils. The fact that pupils do not have sufficient equipment for online learning and they lack motivation for online learning causes challenges for teachers to have effective remote teaching. Secondary teachers of English also have their own issues such as lack of knowledge and skills, bad facility for teaching that keep them from delivering efficient online lessons.

3. What kinds of support should be provided?

In order to answer the question "What kinds of support should be provided?", 6 questions were used. 5 questions are designed with the 5 scales from not very helpful to very helpful; 1 question provides options for choosing.

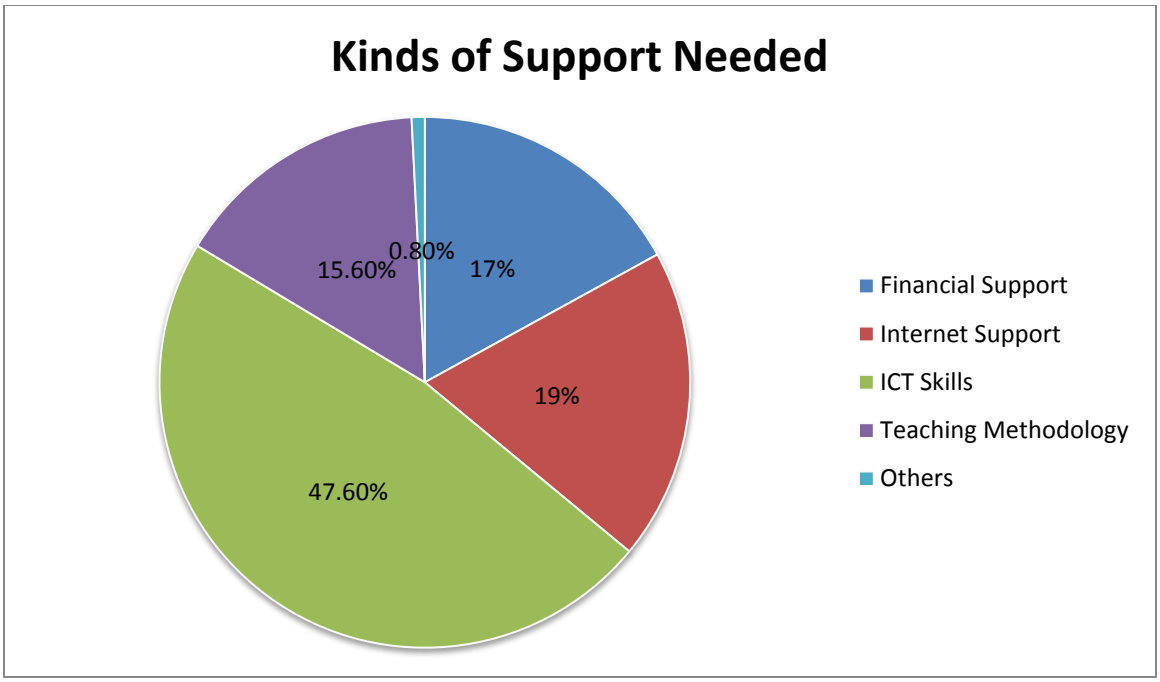

Figure 2: Kinds of Support Needed

As seen from the figure, nearly half of secondary teachers of English in Vietnam wished to be provided with ICT skills (47.6%). Internet support was next with 19%, followed by financial support with 17%. Teaching methodology was selected by 15.6% of teachers surveyed. In other words, the most necessary support is ICT skills.

The answer to the question of why financial support was not the major support that secondary teachers in Vietnam wanted is found in the interview. According to teachers interviewed, they actually need money for investing in their teaching facility at home, but they understood the situation in Vietnam that the budget for education was quite limited.

> *"Q: What support do you want to get for your online teaching?*
> *A: I want to have ICT training. I do not know how to use tools for my online meetings. I also need help for designing the lessons.*
> *Q: How about financial help?*
> *A: Oh, of course I need that, but in Vietnam can we get money for that? I do not think so, especially when we are facing lots of financial difficulties now. Money should be reserved for COVID-19 prevention.*
> *Q: It is surprising that only 15.6% of teachers wished to get teaching methodological support. What do you think are the reasons?*
> *A: I do not know."*
> (Interview with Teacher 7)

Table 1: Support for Effective Online Teaching

N	Items	Not very Useful	Not Useful	Neutral	Useful	Very Useful
1	Lesson plans for online teaching	0%	1.4%	23.1%	46.9%	28.6%
2	Suggestions for online games and short activities	0%	1.4%	23.1%	46.9%	28.6%
3	Webinars about online teaching and ideas	0%	3.4%	21.1%	53.1%	22.4%
4	Video observations of online lessons	0%	4.1%	27.2%	44.9%	23.8%
5	Guidance about online safety and child protection policies	0%	2%	24.5%	40.8%	32.7%

As revealed from the table, secondary teachers of English in Vietnam found it very useful if they could get such supports as lesson plans for online teaching, suggestions for online games and short activities, webinars about online teaching and ideas, video observations of online lessons, guidance about safety and child protection policies. Nearly 50% of teachers supposed that those supports were very useful for their online teaching while around 25% considered they were very useful. In other words, teachers really need methodological support for their remote teaching.

DISCUSSION

Findings of the research show that secondary teachers of English in Vietnam make use of available tools, knowledge, and skills to deal with the abrupt change in the teaching mode from normal teaching to emergency remote teaching. A similar situation is found in many countries such as Sri Lanka, China, Latvia, and Vietnam, where such a sudden change has been applied (Borup & Avmenova, 2019; Balasopoulou et al., 2020; Nguyen & Nguyen, 2021; Mohamad et al., 2020; Gao & Zhang, 2020; Richardson et al., 2020; Schleicher, 2020; Tafazoli, 2021). Teachers all over the world have made use of available tools like Zoom, Google Meet, MS Team, social networks like Facebook, and Zalo to maintain their teaching. Despite their efforts, online teaching is not very effective due to the lack of preparation (Nguyen & Nguyen, 2021).

Methodological, ICT support, and financial supports are what teachers wish to have for their better online lessons. According to Nguyen and Nguyen (2021), teachers should be equipped with instant support and financial aid. In addition, continuous training should be provided to update teachers with quick changes in the teaching mode (Tafazoli, 2021).

CONCLUSION

In order to increase the effectiveness of online teaching conducted by secondary teachers of English in Vietnam, the Ministry of Education and Training needs to consider some solutions to support teachers both in methodology and ICT skills. First of all, training on how to design and deliver online courses should be provided. The training should focus more on the methodology for conducting an online course for secondary pupils with specific strategies and models. Secondly, it is recommended that initiatives and creativity should be conducted to facilitate the process of fully online emergency teaching. For example, the peer mentoring method can be

used as a way for teachers to help each other deal with difficulties arising during their online teaching (Nguyen, 2017; Vo et al., 2020) In addition, policymakers should consider issuing more coherent policies on the delivery of online teaching to ensure the consistent quality of online teaching. Finally, it is advised that the English teacher education programme should be revised so that pre-service teachers of English will have better knowledge and skills for online teaching later.

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FACTORS OF ACCEPTANCE AND USE OF URGENT ONLINE LEARNING DURING THE COVID-19 PANDEMIC AMONG THIRD-YEAR STUDENTS TAKING AN ENGLISH COURSE AT THE UNIVERSITY OF DANANG, VIETNAM

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ABSTRACT

The outbreak of the COVID-19 pandemic has been affecting every field all over the world, especially education. One of the most obvious changes in education is the transition from on-campus learning to online learning. However, this process requires careful preparation for learners' perception. This study, therefore, aims to investigate the perception of acceptance and use of urgent online learning during the COVID-19 pandemic among Third-year students of the Faculty of English, University of Foreign Language Studies, The University of Da Nang (UFLs, UD). With the main survey method by questionnaires, the study found that attitude, motivation, self-efficacy, and use of technology play an important role in cognitive engagement and student learning outcomes. Based on the aforementioned findings, this paper produces some recommendations for educators and students to improve students' perception of online teaching and learning.

Keywords: covid-19, urgent online learning, acceptance, attitude, motivation, self-efficacy, cognitive engagement

INTRODUCTION

Currently, COVID-19 is one of the most serious problems in the world. This pandemic has brought many challenges to most countries across many sectors and in particular, education at all levels has been profoundly affected (Andreas, S., 2020). Education and training are disrupted, training programs and courses cannot be delivered, teaching and learning are interrupted, exams and assessments are also affected. As a result, completion of qualifications is likely to be delayed, affecting the immediate and future careers of millions of learners (ILO, 2020). This is a challenge for Vietnam as well as many other countries around the world to build a sustainable education system because the COVID-19 pandemic might continue to gravely wound the world.

Facing the stressful situation of the pandemic, the Vietnam Ministry of Education and Training has announced the closure of educational institutions nationwide on February 2, 2020 with the motto "schools can be closed, but learning must continue." In Official Letter 795 / BGDĐT-GDDH dated March 13, 2020 on the implementation of online training in response to the COVID-19 pandemic, the Ministry of Education and Training encourages universities to conduct online training for students. On March 23, 2020, the Ministry of Education and Training issued specific guidance on ensuring the quality of online teaching during the COVID-19 outbreak for higher education institutions in the official dispatch No. 988/ Department of

Education and Training - Higher Education. Following the direction of the Ministry of Education and Training, the University of Danang (UD) has issued two important documents: (1) 958 / DHDN – DT dated March 18, 2020 on the application of online teaching and learning for students to courses that are applying the form of face-to-face teaching and (2) 1222 / UDDH – April 6, 2020 on ensuring the quality of online teaching at UD. However, there were no specific plans and basic training for lecturers and students to use educational technology. Because of this, both lecturers and students have encountered many difficulties in the process of teaching and learning online.

One of the major challenges is the perception of students towards online learning. Learners may find it difficult to maintain participation in online courses due to lack of resources, distance learning experience, etc. (Elizabeth et al., 2020). Moreover, given the fact that students are used to the active social life at school, studying and living with friends, the monotony of social distancing and isolation can cause students to become depressed, lose motivation or sluggish in the long run. The problem now is about what factors affect the perception of using and accepting online learning. By determining these factors, higher educational institutes and lecturers can have a particular strategy to ensure effectiveness, objectivity when applying to practice and to provide a positive learning experience and environment for students.

In addition, how to connect with students especially those living in remote areas with an unstable Internet connection and ensure the continuity of teaching activities through online training also needs focusing. To ensure the effectiveness of online teaching, students also need to have basic knowledge of digital technology and related digital skills (Gina et al., 2021). If technology challenges are not addressed, this method of teaching and learning will greatly affect students' knowledge and academic achievement.

In fact, for the third-year students of the Faculty of English, University of Foreign Language Studies, The University of Danang, they have encountered many difficulties in adapting to online learning. Besides the lack of digital technology capacity, many students have also reflected the factors affecting the perception of urgent acceptance of online learning including motivation, affect, perceived behavioral control, etc. With our knowledge and study of related documents, the factors influencing the perception of pressing use and acceptance of online learning will be outlined. Moreover, it is also vital to conduct qualitative and quantitative research, prove our questions and propose solutions for education institutions and lecturers to improve the quality of online teaching and learning and facilitate students to have a positive view of this form of learning.

LITERATURE REVIEW

COVID-19 has modified the way of life of individuals all over the world. In many countries, people are recommended to keep a minimum distance from others and limit travel as much as possible. Moreover, in order to ensure social safety, social distancing regulations are also implemented in education. Most governments in all corners of the globe have temporarily closed academic institutions in an effort to prevent the spread of the pandemic. According to UNESCO 2020, as of April 8, 2020, around the world, 188 countries were forced to close schools nationwide, affecting 91.3% of the total number of students worldwide. The sudden closure of schools, colleges, and universities has disrupted the teaching and learning activities of nearly 1.6 billion students in the globe.

A number of studies have been conducted to explore the effects of the COVID19 pandemic on learning. In 2020, a group of researchers from Indonesian universities has

concluded in the study "University Students Online Learning System During COVID-19 Pandemic: Advantages, Constraints and Solutions" that the advantages that private university students have found when learning online including they can listen to lectures at home, anytime, anywhere; not limited by space and time; they can listen to the lecture again in their free time. However, the Internet connection is unstable which has affected the learning quality of students or lectures and teaching materials do not appear at the same time are the existing problems.

John Demuyakor's results in the report "Coronavirus (COVID-19) and Online Learning in Higher Institutions of Education: A Survey of the Perceptions of Ghanaian International Students in China" (John, 2020) in 2020 showed that students are satisfied with the quality of online education in the Institute of Higher Education in Beijing, China. Students' perception of the effectiveness and reliability of online learning programs received the highest score (3.77), and students' online teaching and learning problems witnessed the lowest average score (3.51). These results confirm that despite some challenges, students at different universities are satisfied with online learning and teaching.

The research paper "Pandemic, social distancing, and social work education: students' satisfaction with online education in Vietnam" conducted by Linh and Trang (2020) concluded that students face several problems when participating in online courses due to the quality of Internet access, such as intermittent connections and low-quality audio. However, most students said that the aforementioned difficulties can be overcome. Student's satisfaction with learning face-to-face was significantly higher than with online across all criteria. Therefore, a long-term strategy is required to improve activities and interactions when teaching and learning online.

Currently, there are few research papers focusing on factors impacting students' perception of use and acceptance of urgent online learning as well as a preliminary exploration of digital technology capacities for foreign language learners during the pandemic. Therefore, this is a new and potentially exploitable area for further study in Vietnam. In addition, due to the lack of study in this issue which can have an influence on third-year students, UFLs, UD, it is necessary for researchers to evaluate the factors influencing the perception of using and accepting technology of this population.

The Theory of Reasoned Action (TRA)

Although the TRA model was first developed in 1975 by Fishbein and Azjen for sociological and psychological research, it has now become the foundation for investigating information technology usage behavior of individuals. In this model, all human's behaviors are predicted and explained through 3 main cognitive components including attitudes (a person's feeling of liking or disliking the behavior), social norms (the influence of society on the subject), and finally the intention of the subject (the decision to perform or not to perform a behavior). These human behaviors must come from intention, systematization, and moderation.

The technology acceptance model (TAM)

The Technology Acceptance Model - TAM is a derivative of the Theory of Reasoned Action model - TRA. The TAM model explains users' motivation to use technology based on the following three factors: perceived benefits that technology brings, perceived ease of use, and users' attitudes towards using technology (behavioral intention).

Kemp et al. (2019) analyzed different technology acceptance models and developed a taxonomy of cognitive forming factors for the use of educational technology by students or lecturers in educational institutions. The taxonomy includes seven main factors: 1) attitudes, affect, and motivation; 2) social factors; 3) usefulness and visibility; 4) instructional attributes; 5) perceived behavioral control, 6) cognitive engagement, and 7) system attributes. Although all of the above factors have impacts on the process of applying technology, this study will only focus on the main factors relating to student's behavior or attitude. Factors that will be studied include attitudes, affect, and motivation; perceived behavioral control; and cognitive engagement. Lecturer-focused factors (instructional attributes), technology design (usefulness and visibility, and system attributes), or social factors will not be studied. The sudden shift to online learning has left lecturers and professionals insufficient time to plan appropriate online instructions.

Attitudes, affect and motivation

Attitude towards behavior (TRA, TPB) plays an important role in attitude and is a factor influencing behavior. López & López (2011) suggested that attitude was influential as a prominent mediator in the voluntary context. Chau also demonstrates "significantly positive effects" (Chau, 2001, p. 30) when attitude is a precondition for both usefulness and ease of use. Attitude is defined as an individual's positive or negative feelings when presenting a behavior with a clear purpose. Therefore, when an individual has a positive attitude towards a behavior, the likelihood of performing that behavior is higher (Tsang et al., 2004), or the attitude has a positive influence on the actual action (Lin, 2011; Mazhar et al., 2014). Teo et al., (2017) found that attitudes can also involve personal aspects rather than being directly technology-oriented, so the experience of the lecturer can directly affect students' attitudes.

Affect: User enjoyment was defined as the degree to which a user feels truly satisfied and enjoyable to use (Martinez-Torres et al., 2008, p. 498). It has been shown to have "a significant influence regarding intent" (Davis et al., 1992, p. 1111). User satisfaction ("the degree to which users feel satisfied with the information systems they have used") (Lee & Lehto, 2013, p. 195) is simply an emotional state.

Motivation: Learning motivation was defined as "the learner's motivation to learn" (Huang & Liaw, 2018, p. 95). Goal orientation was defined as "the motivation towards achievement through the learning process" (Cheng, 2011, p. 275). Both learning motivation and learning goal orientation have their own characteristics that affect does not. Recognizing the latent "satisfaction" aspect of intrinsic motivation (Vallerand, 1997), Kemp et al. (2019) suggested that motivation must be associated with emotion, although its guiding factor is another separated characteristic.

Perceived behavioral control

Abdullah & Ward (2016) demonstrated that there is a link between a user's progress in skill development and their prior experiences. It means that the user's previous experiences have partly influenced the perception of ease of use or self-efficacy in technology skills, thereby changing the attitude of users. There are studies that show that, in fact, the use of embedded systems (Wikis) has a positive effect on users' trust and incessant use of technology (Yueh et al., 2015). The degree of confidence for computer usage was also defined by Teo (2009) as follow:

'A person's degree of confidence in his or her ability to use a computer' is defined as 'the person's assessment of his or her own ability to use a computer'
(Teo, 2009, p.304)

This concept is different from the concept of self-efficacy in online learning. Self-confidence is defined as finding information and communicating with lecturers through the online educational platform and the skills needed to use it (Park, 2009, p. 152). Similar to the degree of confidence in their own abilities in online learning, learners also need to have access to digital technology ("the degree of ease of access to the online education system provided by the universities as an organizational element" Park, 2009, p. 153) and mobility ("the ability to use cloud applications via mobile phones in a manner freedom without limitations in space and time", Yadegaridehkordi et al., 2019, p. 85).

Cognitive engagement

The review by Kemp et al. has outlined the effects of cognitive perception ("a state of deep involvement" Saade & Bahli, 2005, p.320) and flow state ("a person's state when they participate fully and enjoy the process" Saade & Bahli, 2005, p. 318) on learner attitudes, and concentration levels ("the extent to which users maintain full attention and focus on their activities" Liu et al., 2009, p. 602). Accordingly, the concept of "vividness" ("the ability of technology to create a lively medium" Steuer, 1992, p. 80) considers the richness of the senses. "Vividness" is also related to the cognitive process and is separate from the concept of content diversity (under the influence of many types of media). Lee et al. (2009) argued that, in terms of focusing attention and enhancing curiosity, "playfulness" is considered as a measure of the flow state. All three factors: absorption, vividness, and playfulness are related to learners' attention, concentration and receptivity.

The research questions in this study are:

1. What are the factors affecting the perception of use and acceptance of urgent online learning among third-year students of the Faculty of English, UFLs, UD?
2. How are the factors affecting the perception of use and acceptance of urgent online learning among third-year students of the Faculty of English, UFLs, UD?
3. What are the difficulties faced by third-year students of the Faculty of English, UFLs, UD when studying online during the COVID-19 pandemic?
4. What optimistic changes have been experienced by the third-year students of the Faculty of English, UFLs, UD after transferring to the urgent online learning during the COVID-19 pandemic?

METHOD AND SAMPLING

Sampling

The research was conducted at UFLs, one in five regional centres appointed by the Vietnamese Ministry of Education and Training, and the National Foreign Language Project to address the challenges of ICT (Information Communication Technology) in foreign language teaching and learning. In this study, we selected the research population who are third-year students of the Faculty of English, University of Foreign Language Studies, The University of Danang. The study is limited to this population for the following reason: third-year students who have spent 2

semesters of online learning due to the impact of the COVID-19 pandemic, specifically the second semester of academic year 2019-2020 and the first semester of the academic year 2020-2021. With these experiences, the students have enough time to realize the positives and negatives of online learning as well as they can understand which factors have influenced their personal perception in the usage and acceptance of urgent online learning.

We have conducted a random survey on 250 third-year students, Faculty of English, UFLs, UD. During the survey using questionnaires, we excluded those with blank or invalid answers. The number of valid survey questionnaires is 228.

Data collection

The research combines three main methods: documentary research, qualitative research, and quantitative research.

Documentary research method

Domestic and international documents related to the factors influencing students' perception of using and accepting urgent online learning have been collected and selected from previous works. Based on that, related studies on this issue have been analyzed, synthesized, and evaluated in order to build a theoretical basis, design research tools, and opt documents used in the process of analyzing, interpreting, and evaluating results obtained from reality. Finally, how these factors affect students' perception of using and accepting online learning has been evaluated.

Qualitative research method

Students answered open-ended questions attached to the questionnaire to determine challenges and sanguine aspects encountered during social distancing. Two open-ended queries are: "What difficulties have you ever encountered in your learning process throughout the COVID 19 pandemic (learning surrounding factors, financial status, emotions, etc.)?" and "Describe optimistic changes and/or aspects you have experienced since practicing COVID-19 stay-at-home order."

Quantitative research method

After examining the theory of factors modifying the perception of educational technology use undertaken by Andrew et al. (2019), we have built a questionnaire system focusing on attitudes towards face-to-face and online learning, learning motivation, ease of use, self-efficacy, accessibility, and cognitive engagement.

Data analysis

A total of 250 students responded to our online questionnaire hosted on the Qualtrics platform, in which there were 22 invalid answers.

Quantitative data were analyzed with the software SPSS (Statistics Package for the Social Science). The reliability of the questionnaire is computed. Descriptive Statistics would be used to determine the mean scores of the factors affecting student's perception towards the usage and acceptance of urgent online learning methods.

Qualitative data were examined with Dedoose 8.3, qualitative software for coding. The responses were then grouped into the major themes constituting the disadvantages and advantages of online learning.

FINDINGS AND DISCUSSION

Attitude, affect and motivation

Table 1: Attitude and affect in urgent online learning

Item	n	M	SD
Attitude – Prefer in-person	228	4.68	0.79
Attitude – Prefer online learning	228	2.65	0.76
Having problems in learning online	228	3.69	0.87
Affect (Satisfaction with online courses)	228	3.01	0.72

From the data table, it can be seen that students expressed a stronger interest in face-to-face learning than online learning, $t_{(228)} = 14.78$, $p < 0.05$. Furthermore, students who preferred face-to-face learning had more difficulty adapting to online learning. The received responses demonstrated a high correlation between preferring online learning and difficulty in adapting to online learning $r_{s(228)} = 0.628$, $p < 0.05$. Further discussing this issue, students' on-campus preferences are similar to those found in previous studies (Bali & Liu, 2018; Tichavsky et al., 2015), but the experiences cannot be compared with those in the present situation. Students were taking part in urgent online learning but have not been given proper guidance and planning (Daniel, 2020; Murphy, 2020).

With regard to students' opinions about online learning, 100% of students said that they used computers for learning purposes, but students themselves felt that they had an average ability of about 59.4% to use online learning support platforms (MS Teams, LMS, etc.). The difficulty of online learning can also partly explain why students find it difficult to acquire new knowledge through reading (24.56%), and watching on computer screens (25.44%).

In this paper, students are required to self-assess their digital literacy, specifically the ability to use the following digital technology platforms to cater to online learning: word processing applications (MS Word); spreadsheet application (MS Excel...); database applications (MS Access...); presentation applications (MS PowerPoint...); communication applications (Zalo, Messenger...); learning management system (Moodle...); file sharing sites (Google Drive...); search engines (Google, Coccoc, Opera...); online dictionary (Oxford.com...). The results will be presented in the perceived behavioral control section.

Table 2: Correlation between digital capacity and attitude towards online learning

		Self-assessment of digital technology capacities	Attitude – Prefer online learning
Self-assessment of digital technology capacities	*r*	1	.641**
	p		.000
	N	228	228
Attitude – Prefer online learning	*r*	.641**	1
	p	.000	
	N	228	228

**significant $p < 0.05$

However, after putting these factors into comparison, we realized that there was no correlation between digital capacity and attitude to face-to-face learning preferences. Meanwhile, there was a strong positive correlation between digital capacities and attitude to online learning predilection. This proved one thing: the more digitally competent students are, the more likely they are to prefer online learning.

When analyzing the correlation between digital technology capacities and students' difficulties in online learning, the negative correlation $r_{(228)} = -0.332$, $p < 0.05$ could be taken for granted. The more students perceived themselves to have good digital capacities, the more they would feel that there was no difficulty in learning online and vice versa. Several previous studies (Liaw & Huang, 2011; Rhema & Miliszewska, 2014) have shown that students' skills in the field of digital technology were a significant factor affecting students' attitudes towards online education. From those results, it could be seen that digital literacy and technology issues in online learning are related.

Table 3: Motivation in urgent online learning

	N	M	SD
Motivation – Before social distancing	228	3.57	0.47
Motivation – After social distancing	228	2.75	0.58

Students continued to assess their perceptions of the factors which boosted their motivation to go to school after the social distancing order was implemented. The answers had a high level of confidence (Cronbach's alpha = 0.85). We have calculated the average score for the 7 factors "before" the social distancing order and the average score for the 7 factors "after" the social distancing order. The result indicated that students were more motivated "before" social distancing order than "after", $t_{(228)} = 6.69$, $p < 0.05$.

Regarding motivation to continue learning during social distancing, quantitative and qualitative data have shown that students were more motivated to study prior to the implementation of the stay-at-home order. Consistent with the existing literature (Albelbisi & Yusop, 2019; Sun et al., 2018), this study determined that when students were unmotivated, the level of cognitive engagement decreased and vice versa. Clearly, motivation has boosted the student's persistence in performing certain tasks.

Similarly, the conclusion of this study confirmed that student motivation has decreased when switching to online learning and that interaction was a motivating factor for students. In the qualitative data, the students said that the lack of interaction with lecturers and other students was a challenge for them. When students were unable to choose a learning method according to their personal preferences and must use online or hybrid methods, lecturers needed to consider student's motivation. As Bower (2019) mentioned, "in the context of technology-mediated learning, the actor's intent lies with the people, not the technology" (p. 1037). Although emotions were not surveyed in the quantitative data, in the open-ended questionnaire, 25 students (14.45%) wrote that anxiety and boredom were a challenge that increased negative emotions. Excessive anxiety could limit motivation and negatively impact achievement while pride tends to positively impact intrinsic motivation, academic effort, and achievement (Heckel & Ringeisen, 2019).

Perceived behavioral control

Perceived behavioral control relates to the advantages or disadvantages of using technology for student education. It includes students' perceptions of ease of use, self-efficacy, and access to technology.

Ease of use digital technology in learning

Table 4: Proficiency in using digital technology in urgent online learning of students before and after the social distancing order

	n	M	SD
Level of technology use - Before social distancing	228	2.73	0.73
Level of technology use - After social distancing	228	4.07	0.77

Students were asked how often they used technology platforms before and after the social distancing order. After calculating the average score, the data showed that students had a mounting frequency of using technology platforms for learning after the stay-at-home order when compared to before, $t_{(228)} = 20.83$, $p < 0.05$. This study indicated that students have used more online educational platforms and tools after switching to online learning. As mentioned by Murphy (2020), the use of urgent online learning programs increased students' knowledge of technology tools. The knowledge and experience gained could help students get more confidence in their ability to use online education technologies to support their future careers and life.

Self-efficacy in online learning

Table 5: Student's self-efficacy in urgent online learning

	n	M	SD	t	
Ability to complete assignments on time	228	2.61	0.71	12.88	**
Proficiency in using new learning tools (Analyze/create videos, online quizzes, etc.)	228	3.70	0.98	10.75	**
Ability to get good grades in classes	228	2.40	1.07	5.65	**
Possibility to discuss topics with classmates and/or lecturer	228	2.47	1.01	6.96	**
Time management skills	228	2.65	0.83	12.15	**

**significant $p < 0.05$

One-sample t-test with a mean of 3 has been applied. The analysis data showed that students had little skill development in 4 out of 5 questions asked: Ability to complete assignments on time; ability to get good grades in class; the ability to discuss topics with classmates and/or lecturers; time management skills. Only the item "Proficiency in using new learning tools (Analyze/create videos/online quizzes, etc.)" was assessed by students as having an improvement after the online learning process.

Table 6: Correlation between digital capacity and self-efficacy

		Self-assessment of digital technology capacities	Self - efficacy
Self-assessment of digital technology capacities	*r*	1	.612***
	p		.000
	N	228	228
Self – efficacy	*r*	.612***	1
	p	.000	
	N	228	228

**significant $p < 0.05$

It could be seen that digital technology capacity also contributed to confidence in students' own abilities in the process of participating in online learning, which was clearly shown in the strong correlation between the two factors $r_{(228)} = 0.612$, $p < 0.05$.

Another important factor for the successful adoption and use of online learning (either urgent or not) was self-efficacy. The conclusions of this study are consistent with previous studies that found that students who applied multiple self-regulation strategies were more likely to complete academic tasks (Abdullah & Ward, 2016; Alghamdi et al., 2020). Self-efficacy affects exercise choice, effort, persistence, and achievement; simultaneously it is directly related to the expectations and learning outcomes of students (Alghamdi et al., 2020).

Opportunities to access digital technology in learning

The data has shown that the reliability of the question was very high (Cronbach's alpha = 0.748). Students have access to technology tools at a constant level most of the time, $t_{(228)} = 36.84$, $p < 0.05$.

Table 7: Level of awareness about opportunities to access digital technology in urgent online learning of students

	N	M	SD
A reliable digital device (e.g. computer, tablet, mobile device)	228	3.45	0.565
A reliable Internet service	228	2.96	0.813
Communication software/tools (e.g. Skype, Zoom, Teams, Google Classroom)	228	2.65	0.921
Support service to solve technical problems	228	2.01	0.919

Cognitive Engagement

Cognitive engagement involves the learner's enthusiast and receptivity. The answers showed that the reliability of the question was extremely high (Cronbach's alpha = 0.816). Surprisingly, students felt no improvement in their scores. But students all reported there was a decrease in the remaining 5 factors: Knowledge; Concentration; Level of interaction; Attendance; Attention and enthusiasm. The average score of the student's assessment has a decrease, $t_{(228)} = 3.57$, $p < 0.05$.

Table 8: Changes in students' urgent online learning

	n	M	SD
Academic results	228	2.58	0.56
Knowledge	228	2.17	0.79
Concentration	228	2.01	0.76
Level of interaction	228	2.59	0.77
Attendance	228	2.44	0.85
Attention and enthusiasm	228	2.99	0.87

The role of cognitive engagement

We have tested different data to see correlations between variables. When comparing students' attitudes towards knowledge delivery methods and cognitive engagement, we found that there was a negative correlation that occurred between in-person learning preference and cognitive engagement $r_{s(228)} = -0.392$, $p < 0.05$. This meant that if more students preferred face-to-face learning, students' cognitive engagement would be reduced and vice versa. When students preferred online learning, cognitive engagement increased of $r_{s(228)} = 0.670$, $p < 0.05$. Students' attitudes and their cognitive engagement are deeply linked to online learning during the COVID-19 pandemic.

Likewise, motivation and self-efficacy were related to cognitive engagement. We compared the motivation to go to school after the COVID-19 pandemic with the cognitive engagement and obtained data showed that these factors strongly correlated with each other, $r_{(228)} = 0.340$, $p < 0.05$. The more motivated the student, the better their cognitive engagement was. Furthermore, there was a positive correlation between self-efficacy and perceived engagement $r_{(228)} = 0.696$, $p < 0.05$. Student expectations and their self-efficacy were closely related to their academic performance.

Perception of self-efficacy

Self-efficacy is an important factor in the success of online learning (Albelbisi & Yusop, 2019). We have analyzed the factors affecting self-efficacy. Also, we have compared student's previous experience and knowledge of technology with their self-efficacy. If they have used technology before, it will be easy for them to use it again (Kemp et al., 2019). Participants' responses showed that there was a strong correlation between technology use before the COVID-19 pandemic and self-efficacy $r_{s(228)} = 0.373$.

The study also showed a negative correlation between preferring face-to-face learning and self-efficacy, $r_{(228)} = -0.392$, $p < 0.05$ (students believed that they would not succeed, and it was related to negative attitudes towards the method of knowledge transmission.) In contrast, students who preferred online learning had a positive correlation with self-efficacy $r_{(228)} = 0.537$, $p < 0.05$.

Students' access to technology and learning environment

Accessibility refers to the student's possibility to connect to the Internet, device reliability, and technology support. Connection is closely related to online teaching. In light of the COVID-19 pandemic and the closure of educational institutions, students had to stay at home, therefore, connection to technology tools and supports may change. Therefore, we have compared the accessibility to digital technology with cognitive engagement and the data showed the

correlation $r_{(228)} = 0.473$, $p < 0.05$. Not surprisingly, the lack of accessibility (equipment, support, Internet connection, etc.) was related to students' cognitive engagement.

Finally, universities must be aware that accessibility is critical to a successful online learning experience. As the results from this study, accessibility is not only related to accessing the Internet or a digital device, it is also relevant to the learning environment. One of the students who participated in the survey wrote that since the pandemic broke out, she has had to leave Da Nang and return to her hometown with her family. Since the time of social distancing, she has expressed her difficulty to continue studying. Firstly, her family doesn't have Internet connection, so she had to go to a neighbour's house to connect to the Internet. Second, she has had to help her mother take care of her siblings, so access to educational technology tools has been nearly impossible. Clearly, her cognitive engagement was severely reduced. This study cannot reach students like her because it is an online survey, but we need to understand that there are students who lack accessibility, and accessibility is directly related to cognitive engagement.

Qualitative data – difficulties and optimistic changes throughout the time of COVID-19: Difficulties encountered

Table 9: Difficulties and optimistic changes in students' urgent online learning during the COVID-19 pandemic

	Theme	Category	Number of students
Difficulties	Situational and environmental difficulties	Getting distracted at home	40
		Financial difficulties	28
		Inefficient in-person communication	22
		Balancing work/study – life	16
		Natural disasters	12
	Online learning difficulties	Unfamiliar with online technology	39
		Exercise volume increased	25
		Reducing interaction	19
		Decline educational quality	13
		Lack of academic support	10
	Emotional difficulties	Lack of motivation	23
		Procrastination	21
		Pessimistic feelings	15
Optimistic changes	Advantageous revision	Reviewing lessons easily	32
	Self-development	Self-care	24
		Learning new skills	21
		Time management skills	16
		Staying in shape	11
	New gaining	New hobbies	35
		Understanding family better	29

Three themes stem from the difficulties: Situational and environmental difficulties, online learning difficulties, and emotional difficulties. The research results are arranged in descending order of the mentioned difficulties.

a. Situational and environmental difficulties

Students said that their biggest difficulty is staying focused at home. There were many distractors such as distractions from other family members, surrounding noise, and other

commitments. In addition, many students perceived home as a place to rest, not entirely to study, so staying focused was extremely difficult. The students wrote: "A lot of irritating situations have happened in my family. Sometimes I can't concentrate on lectures" or "I work better in an environment separating from my family".

The second trouble is financial difficulties during the pandemic. Some students wrote: "I barely have money to live on." In addition, some students also said that due to the impact of the pandemic and natural disasters, their families could not afford tuition fees for the next semesters.

Another challenge is that students lacked regular communication with their friends or lecturers while communication is an indispensable human need. It was also mentioned that difficulties in coordinating private life, work, and study were puzzling problems. Here is a representative quote: "It is difficult for me to focus on studying while taking care of siblings and doing housework." Other drawbacks students mentioned were inefficient in-person communication and impacts of natural disasters (loss of lives or crops, evacuation, etc.).

b. Online learning difficulties

Another major difficulty reported is the lack of familiarity with online technology. One student said, "I feel tired when looking at screen for a long time". Another student with tremendous comment: "I find that it's very tough for me to learn online because of the lack of knowledge about technology. Firstly, I don't know how to use those platforms for my study because I haven't been taught about them. Secondly, the Internet connection is another barrier of online learning. I am a student, mostly living in rental house so my Wi-Fi connection is not strong enough to join a class without losing Internet connection in the midway". Moreover, students also found it hard to understand the academic materials provided by the lecturers.

The next concern that was mentioned more often is that some students reported being stressed by the increased workload and having issues because they are not familiar with some online tools. The student wrote: "The lecturers assumed that I had much spare time due to the pandemic, so that they increased the quantity of homework. However, I had to complete homework in many different courses, so the increasing amount of homework made me feel so pressured."

Furthermore, students reported that they have also encountered several problems in interacting and communicating with lecturers. It is challenging for students to ask questions directly to the lecturer as soon as they feel curious. In addition, the quality of the learning process has declined after switching to online learning. Here is a representative quote: "The noise is one of the disruptions to my study. I can't concentrate on my lesson because of the noise from lecturers, friends, as well as my neighbourhood. It leads to the fact that my learning quality is significantly reduced". Finally, the lack of academic support resources to complete school assignments was also a challenge for some students. The student said, "I can't use and practice other learning methods like group study or library research."

c. Emotional difficulties

One of the most common difficulties lecturers faced is the reduced students' learning motivation. After a period of online study, students often forget the reason why they signed up for the course, and the spirit of studying was sluggish. The student wrote: "I have the feeling that learning now is no longer as vital and fascinating as it used to be, which makes me lose lots of motivation" and "no motivation to do anything if I don't even want to leave my room".

Because of a lack of motivation, many students reported that they have procrastinated on many personal projects, including those intended to improve their major knowledge. In addition, students also experienced anxiety and stress, especially worrying that they could be infected with COVID-19. The student wrote: "I am so nervous that I can't concentrate on anything. I am afraid that I will be isolated for a long time and that will greatly affect my academic performance".

Optimistic changes linked with the COVID-19 pandemic

Three themes related to positive aspects and/or changes that students experienced after social distancing include: advantageous revision, self-development, and new gaining. The research results are arranged in descending order of the sanguine aspects mentioned.

a. Advantageous revision

Online learning helped students grasp the lectures better because the lecturers would speak or record the lessons through the micro and when listening to the lectures, the sound would be very clear and easy to hear. Second, in online classes, lecturers often recorded lessons and uploaded them to the school's intranet, so students could easily review the lectures at any time.

b. Self-development

One category mentioned by many students was self-care. Staying at home allowed students to look back on their own shortcomings and limitations and then found ways to overcome and change. A representative quote is as follows: "Stay-at-home order allows me to spend more time taking care of myself. I take advantage of this time to look after my skin and body."

The category mentioned as a benefit of social distancing was to learn new skills. Students said they have learnt to use new technology tools such as Zoom, MS Teams or LMS and at the same time, they lived more organized and disciplined. Furthermore, some students have become self-directed, signing up for certification courses or trying to learn a new language. One student wrote, "During this "online learning" period, I can learn from alternative online platforms and easily have a research on my subject to understand lessons profoundly."

Moreover, this period also helped students know how to manage their personal time more effectively. They had to actively schedule a time to attend online lessons, complete assignments in many subjects, and do housework. In addition, students would spend their free time practicing sports to improve health during the pandemic so that students could get in good shape.

c. New gaining

Participating students expressed that they had more time to change themselves and that they were doing activities they had never done before such as reading or cooking. One student wrote, "I have time to do the things I've wanted to do for a long time but haven't been able to do it yet, such as gardening and decorating. This is a very nice opportunity for me." Another category on this topic was a better understanding of the family. Many students share the idea said that: "As I have to stay at home all day, I spend more time with my family than ever. Thanks to that, I got to know my family members better and I really appreciate this time".

CONCLUSION

This study explores university students' perceptions of the use, adoption, and acceptance of urgent online learning during COVID-19 social distancing regulations. Obviously, face-to-face education has an overall ecosystem designed to support learners (learning centre, extracurricular activities, library, etc.). Similarly, online learning requires time to define and build (Hodges et al., 2020). In urgent situations, (another wave of COVID-19, hurricanes, wars, etc.), it is important to remember that online education or hybrid education must be an urgent response that is innovative and feasible for each specific crisis and requires more reflection and interaction than any previous educational experiences.

The results showed that students' motivation, self-efficacy, and cognitive engagement decreased after the transition to online learning, while the ability to adapt to new technologies was significantly improved. The crisis brought about by COVID-19 is not over yet and we need to meet the wants and practical needs of our students if we want them to continue to have positive higher education experiences.

Knowledge is important, but without the right conditions, students may again undergo negative experiences and consequently their cognitive engagement declines. The study showed that lecturers must be aware of these negative changes; at the same time, encourage and motivate students to construct new knowledge on the groundwork of their prior understanding. When all universities understand the difficulties that students are facing, they will find reasonable solutions to overcome these problems.

More researches are required to explore how inequality affects student learning opportunities and outcomes. Some students do not have access to technology tools and/or family conditions limit their access. The future works had better reach this sample and understand the short and long-term effects the pandemic may have on them (dropping out of school, failing exams or dropping projects). This will be the most effective way to create the right strategies and resources to help all students continue their education feasibly.

Furthermore, it is important to understand how COVID-19 affects lecturers' teaching styles and/or strategies. The lecturer's teaching experience and the student's learning experience can share the correlativeness. Universities, colleges, lecturers, and students have faced different challenges posed by the pandemic, and these challenges have had unintended consequences for teaching and learning.

It is essential for further researches on this field in the future to assess whether a short training session on self-efficacy and motivational strategies for students can improve their cognitive engagement in the process of studying online or not. The training session can occur just in a short time at the beginning of each course, presenting a short video explaining the relationship between attitudes, self-efficacy, cognitive engagement, and some applied strategies. The right perception can motivate students to study harder.

The pandemic has changed the social and working lives of many people. More works are required to understand why the lack of physical contact, reduced social interaction, and the negative emotions that the pandemic created (fear, sadness, uncertainty, etc.) could impact students' daily habits (eating, sleeping, watching TV...) and whether changes in the environment and students' daily life have any relationship with their learning process.

Finally, it is important to compare students' perceptions of the use and acceptance of urgent online learning across different countries. It will help higher education institutions identify similarities and differences, thereby developing appropriate strategies in light of the pandemic that has affected most countries around the world. This is a challenge we all face, and we can help each other to cope with it effectively.

RECOMMENDATION

The transition to online training due to the impact of the COVID-19 pandemic is a great challenge for tertiary institutions in general and UFLs, UD in particular. Based on the conclusions and results collected during the research, we have found the causes affecting the perception of acceptance and the use of educational technology platforms for urgent online learning by third-year students, UFLs, UD in the period of social distancing. On that basis, we propose some solutions to help universities, colleges, lecturers, and students overcome some of the difficulties in the online learning process as follows:

For higher educational institutes, it is important to explain to students that their attitudes can affect (positively or negatively) their learning experience and cognitive engagement so that students can try to consciously improve their attitudes towards urgent educational methods. As mentioned by Bandura (1977), expectations were mainly related to people's hopes for favourable outcomes.

For the 3rd year students, UFLs, UD, most of the courses are taught in different languages. Supporting materials, reference materials, self-practice exercises (in the form of text or audio) are essential for them. Some students think that online learning does not bring as good results as face-to-face learning method and makes it difficult for both learners and lecturers because of technical problems or manipulations. Using educational technology platforms takes time and hinders teaching and learning activities. However, these students did not know that online learning did not bring the results they wanted, partly because of themselves (Hodges et al., 2020; Murphy, 2020). Most of the inconveniences and difficulties stem from students who have not had much experience with digital technology platforms. Therefore, in order to solve this problem immediately, we recommend that the institutes organize training sessions on the use of digital software or short-term training courses on technology capacity in order to improve online teaching and learning skills. Digital technology skills will help students quickly adapt to the current situation and change their way of thinking when it comes to online learning. Organizing training sessions to deal with problems arising in the process of online teaching are also essential for lecturers.

To be able to participate in urgent online classes, each student must spend a certain amount of money to purchase equipment and sustain a high-speed Internet connection. Therefore, immediate support from the universities and colleges in such critical situations is essential, such as supporting gifts from faculty leaders and sponsors. The policy of tuition exemption and reduction for students whose parents have lost their jobs or were temporarily absent from work due to the consequence of the COVID-19 pandemic could give a lot of motivation to students to continue their studies.

This study recommended some suggestions for lecturers. In addition to the lack of reference sources, during the survey, we received some feedback from the students about the difficulties they encountered when finding the mid-term or final trial tests, types of audio files related to listening and translation skills. Lecturers should provide students with sample tests or reference sources with the same structure as the real exam so that students can have a more general view of the exam as well as shape and systemize the types of knowledge they have learnt.

Lecturers should also supply academic and reference materials to avoid students using unorthodox materials, making it difficult to study and research, and moreover to help them be more active in their studies.

Most of the teaching activities for third year students, UFLs, UD are undertaken by using the MS Teams application. However, most of the video recordings of lessons after being saved

into the system by lecturers are very large in size and have an expiry download period of 20 days, causing many difficulties for students who want to review the lecture in the future. Lecturers are advised to create class groups on social networks such as Messenger, Zalo, Viber, etc. or backup lecture videos to Google Drive so that students can review them when needed.

In order to stimulate creative thinking in learning, help students understand the lesson content, and create learning motivation for students, lecturers should strengthen inferential questions related to the lesson and add bonus points for students with the best and correct answers.

Lecturers are suggested to strengthen the form of mini exercises, critical exercises, and division of work in groups during the lesson so that students have the opportunity to interact, learn from each other, and avoid monotony in the learning process at home. Moreover, it is important for lecturers to consider the amount of homework assigned to students after school. Because at the same time they have to accept many sudden changes in both study and life, students cannot adapt at first. The fact that lecturers assigned too much homework also partly affects the psychology of students during the urgent online learning process due to the qualitative data.

Accessibility is not just about having an Internet connection or computer, home conditions also affect concentration levels and access to educational tools. Flexibility, tolerance, and communication should be common elements in online classes. Due to the urgent situation, many lecturers had to use new tools without equipping the students. For similar experiences in the future, lecturers can use new tools whenever they have made sure their students feel confident enough in their ability to successfully use those tools.

Because the learning conditions of each student are different, especially those who live in noisy conditions or whose families have many brothers and sisters participating in online learning simultaneously, being distracted while studying and having problems related to network transmission are inevitable. Lecturers should support their students to switch classes to equivalent classes (being taught by the same lecturers in that semester) with the same progress.

There are suggestions especially for students:

- Every student needs to actively learn the output requirements of each module, thereby making a specific and suitable study plan for themselves to achieve the best results.
- Students are required to raise a sense of learning, read documents in advance and learn related knowledge before each class to improve learning efficiency. Students also have to actively interact and express opinions with lecturers and friends during each lesson, and contribute to the construction of the lesson.
- During the learning process, if students encounter any difficulties, they need to actively contact the lecturers, the academic advisor, and the technical support department to receive advice and support. In addition, students also need to voluntarily learn how to use and fix common problems when using technology platforms for online learning.

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IMPROVING VOCABULARY LEARNING WITH MEMRISE MOBILE APPLICATION FOR STUDENTS IN VIETNAM

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ABSTRACT

In English study, vocabulary is the backbone of English so that improving vocabulary is also one of the most essential keys to learning English well. Thanks to the Internet, students now have many opportunities to take advantage of advanced technology to improve their vocabulary, one of which is making use of online tools. This research looks at the use of Memrise, an application designed for improving vocabulary. The authors also investigate the changes in vocabulary level and attitudes of English of students in the University of Foreign Studies, the University of Danang, Vietnam toward applying this mobile application in improving their vocabulary. Furthermore, the study's results indicate how the students rate the quality of the application. More importantly, this paper gives specific suggestions for using Memrise for learners with different levels of English.

Keywords: vocabulary, students, Memrise, application, technology

INTRODUCTION

For the past forty years, English has been the dominant foreign language in Vietnam, where English language education has become a compulsory module of education (Nguyen, 2011). Furthermore, Nguyen (2010) claims that Vietnam, as a member of ASEAN, APEC, and recently WTO, is supposed to be part of the globalization of English. Additionally, the growth of English has been closely related to technological innovations, then the effectiveness of using technology in education is more and more acknowledged (Pearaer et al. 2009). Recently, with the popular use of mobile devices, the potential of Mobile- Assisted Language Learning (MALL) has been taken into consideration. Apart from computers, mobile devices are seen to have proven as potential tools in increasing the learning of the language. The rapid growth of the new generation of mobile devices such as mobile phones and tablets has increased the great potential of the use of mobile in becoming an effective tool for language learning (Gounder, 2011). Additionally, the personal nature of mobile phones and their portability allows students to gain to access their language learning materials and contact their teacher or classmates whenever and wherever they need. With such flexibility, new directions in CALL have been opened by MALL with the possibility of exceeding all non-mobile CALL (Glikman et al., 2012). Following this trend, more students in Vietnam start using mobile devices for language learning purposes and it becomes popular with the English Department students of the University of Foreign Languages Studies- Da Nang University. However, there have been few studies on what ways and what aspects mobile learning can be applied to improve the students' English learning progress in the context of this university.

To reach a certain level of fluency in a foreign language in general and English in particular, vocabulary is undoubtedly one of the most important factors to be mastered; indeed, the famous linguist D. A. Wilkins (Wilkins, 1972) stated: "Without grammar, very little can be conveyed; without vocabulary, nothing can be conveyed". In learning a foreign language, vocabulary is reputedly the small bricks forming the ability to use the language. As the most popular application of educational software, Memrise is the perfect answer for studying English the vocabularies. This research focuses on methods for effective use of mobile applications to enhance vocabularies of the English Department students of the University of Foreign Language Studies, the University of Danang, Vietnam.

LITERATURE REVIEW

Vocabulary and vocabulary learning

Vocabulary plays an important part in the development of the four language skills: speaking, listening, reading, and writing (Harris, 1969; Siribodhi, 1995). Evans (1978) and Beck et al., (2002) pointed out that vocabulary can provide clarity and can enable the speaker to diversify language. Also, wrong use of vocabulary can lead to misinterpretation, whereas correct use of vocabulary makes it easier for people to read and write better, understand the main ideas and speak correctly (Lightbown & Spada, 2006). Researchers (Harley, 1996; Kolich, 1985; O'Rourke, 1974) point out that vocabulary learning is a vital part of each student's life. According to O'Rourke (1974), it affects students' thoughts, actions, aspirations, and success, especially in academic achievement. Studies noted that without adequate knowledge of relevant vocabulary, students have difficulty performing the tasks required of them both in school and on the job (Harley, 1996; Kolich, 1985). Blake (2013) even makes the claim that a second language learner who is lacking the needed vocabulary depth or breadth will have difficulties with reading any large amount of authentic texts. According to Blake (2013), students who use a wide variety of words have little or no difficulty reading fluently, understanding the author's intent, and expressing themselves correctly and concisely in both oral and written forms. Laufer et al. (2012) also point to vocabulary breadth as being closely related to overall language proficiency.

In language learning, vocabulary affects almost all skills, such as reading, writing, speaking, listening, and other forms of oral communication as discussion, dialogue or prepared talk. Also, vocabulary plays the most important part in the development and the continuous improvement of these skills. According to Carter and McCarthy (2018), the study of vocabulary is considered the heart of language teaching and learning. In addition, Nation (2001) holds the viewpoint that a word cannot be well known after only one exposure since there is so much information about a single word. As a result, repetition and recycling of vocabulary are of crucial importance when it comes to actually learning new words (Nation 2001; Schmitt 2010). When learning vocabulary in a second language, technology can be of great help due to the pictures and video glosses connected to the words provided (Hede et al, 2002). Today there are both websites and apps that allow learners to broaden and deepen their vocabulary that way (Blake 2013).

Mobile Technology in language learning

The power of portable computing in the form of mobile devices is accessible to everyone, and it is time to consider using mobile devices for education (Godwin, 2011). Besides, Hubbard (2013) is of the opinion that people across the world wish to access learning materials on their mobile

phones rather than acquiring another technology to receive learning materials. The numbers of mobile devices across the world have already surpassed the number of computers and other electronic gadgets, and it is indeed an opportunity for English language teachers to innovate methods and materials for interactive and enjoyable sessions to motivate the students in their classroom (Hsu, 2012). In a regular classroom, students often complain that they learn vocabulary, but find it difficult to remember (Nation, 2001). Norbrook and Scott (2003) stated that there has been a greater awareness concerning vocabulary learning in recent years, and it is the responsibility of researchers, materials designers, and teachers to increase the pace, using the latest technology in the classroom, in this era of technological advancements, the majority of the undergraduate student population possess latest mobile phones and use it for a wide variety of purposes. All of the features of mobile technology in learning could be described in Figure 1.1.

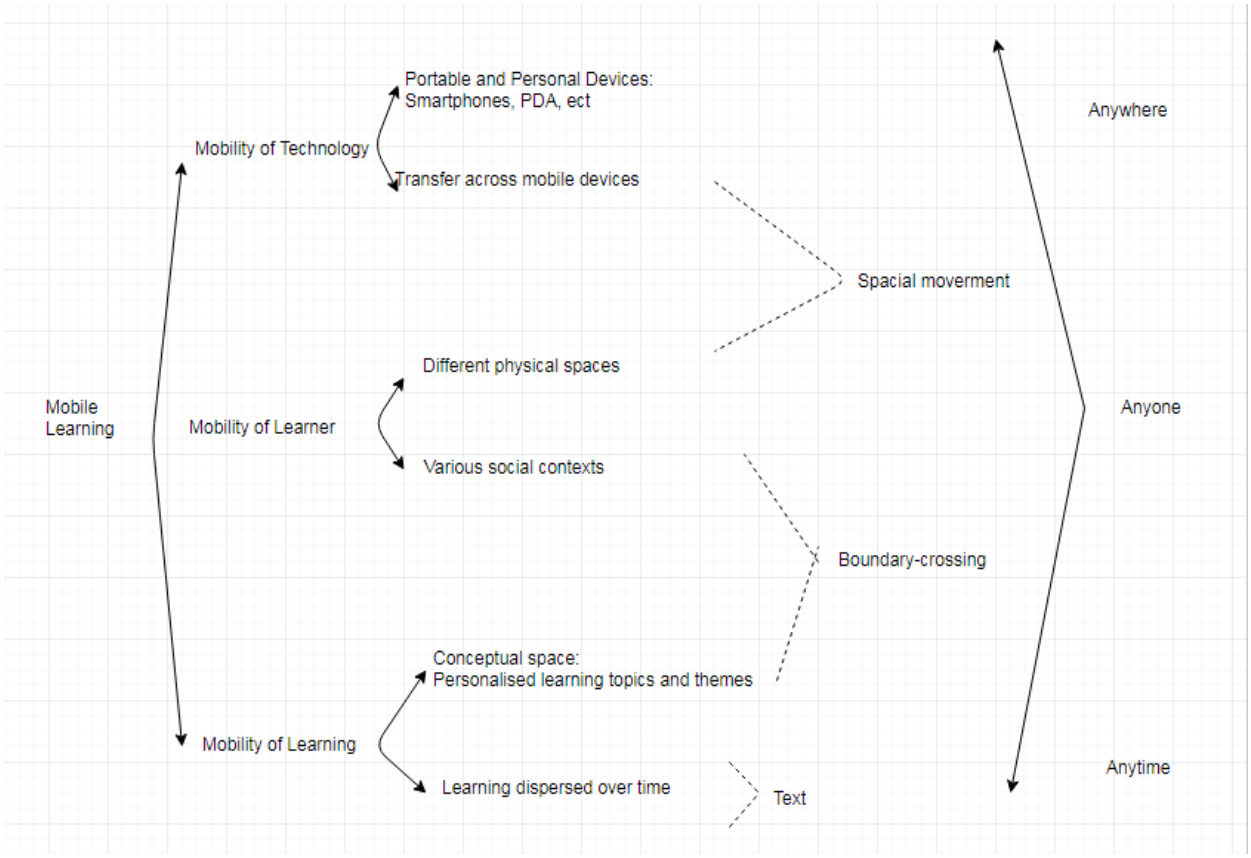

Figure 1: The convergence of the concept of mobile learning (Adapted from Defining Mobile Learning in the Higher Education Landscape Osman et al., 2010))

Memrise Software in Vocabulary Learning

This application was chosen for two main reasons. First, it provides users with a lot of different topics course to improve students' vocabulary. Second, it is the mobile version of the famous Memrise web tool. In addition, this software has been selected by Google as the overall Best App winner in the 2017 Google Play Awards. As a result, this software's reliability is ensured.

This application can be downloaded from Google Play Store and Apple App Store. It provides users with many courses which have many vocabulary topics in one. All the courses contain spelling, meaning, pronouncing from native speakers. When using this app, the users can begin learning languages such as Arabic, Ancient Greek, Chinese, English, French, German, Icelandic, Italian, Japanese, Klingon, Korean, Latin, Portuguese, Russian, Spanish, Swahili, Swedish, Turkish, and more. However, in this investigation, the researcher just focuses on English learning. Furthermore, when learning English in Memrise, the users can choose the pronouncing between UK English and US English.

METHOD AND SAMPLING

The methodology selected for this study is a case study which is suitable with an empirical inquiry developing an in-depth understanding of a real-life phenomenon (Yin, 2009). In a case study, the researcher seeks to develop an in-depth understanding of the case by collecting multiple forms of data (Cresswell, 2012). Case study is the most frequently employed qualitative research design that allows the researchers to learn more about the issue under study (Merriam, 2009). Therefore, it is deemed most appropriate. Merriam (2009) defines a qualitative case study as "an in-depth description and analysis of a bounded system" and the researcher chose this design "precisely because researchers are interested in insight, discovery and interpretation rather than hypothesis testing". The case is examined via an experiment. Following this methodology, the researcher deliberately controls and manipulates the conditions, which determine the events in which she is interested, introduces an intervention, and measures the difference that it makes (Cohen et al., 2013). The experiment is built upon a combination of quantitative survey methods, observations and interviews. The experiment in this study is organized both online and offline for the students of the English Department of University of Foreign Language Studies- The University of Danang. All these could be considered constituting units of analysis or an embedded (multiple units of analysis) design (Yin, 2009). This approach is appropriate e to gain an insight into the Memrise enhancement of students in developing English vocabulary learning. It is, therefore, assumed that the findings of this research may translate to other schools in similar contexts (Cohen et al., 2013).

The population of this study was 200 voluntary students who study at the English Department of the University of Foreign Languages Studies, The University of Danang, Vietnam. These 200 students were randomly put into 2 groups, namely the control group and the experiment group so that the treatment would be done to get the results. The target university students all had similar educational backgrounds. That meant they are capable of self-regulated learning in English. Before the experiment, these participants were asked to answer a series of questions about their learning approach, in order to confirm that all of the participants learned English by self-regulated learning approach.

The data collection was divided into two stages: before-Memrise use and after-Memrise use. Individuals in the experimental group received the experimental treatment using Memrise for 2 months, whereas those in the control group did not. This technique makes it easier for the author to find out the impact of Memrise on the students' improvement. The data collection was conducted at both stages by distributing the pre-usage and the post-usage questionnaires directly to them. The tool's name, its purpose, and its instruction of use are included in the tutorials.

In this research, instruments are used as a tool for collecting data and measurements. The typical arrangements used in the study include tests, a questionnaire, and direct measurement. Data needed in this research is primary data. The primary data are data related

to the learning activities, which are collected by the test before and after using Memrise. Data were collected by using direct measurement instrument- the vocabulary tests and the questionnaires that were done on all the students either joined in experimental group and control group.

This research aims at finding the answers to the following questions:

1. How effectively do the students learn English vocabulary?
2. In what ways does Memrise application impact students' vocabulary learning?
3. What are the issues and challenges faced by students in utilizing Memrise for their learning?

FINDINGS

Students' self-study methods of vocabulary

Table 1: How students improve vocabulary by themselves

Methods	Number of students	Percentage
Keep a list	122	61%
Watching English movies/ shows within/without subtitles	23	11.5%
Reading English books	2	1%
Practicing with online applications	23	11.5%
Use new words in conversations	5	2.5%
Practicing through communicating with foreigners	3	1.5%
Practicing with materials given by teacher	10	5%
Play games	3	1.5%
Write a blog	3	1.5%
Learn word parts	5	2.5%
Learn the culture	1	0.5%
No answers	0	0%

Table 1 presents different methods which aim at improving English vocabulary given by participants. Keeping a list is the most popular method with 61% of the students applying this method to improve their vocabulary. Following this method are watching English movies/ shows within/without subtitles and practicing with online applications listed by 11.5% of students. Practicing through communicating with foreigners is also one of the popular methods for students when it accounts for 5%. Two methods having the same proportion (2.5%) are using new words in conversations and learning word parts. A considerable number of students (1.5%) practice through communicating with foreigners as well as playing games and also writing a blog. It is noticeable that there are 2 students (1%) who studying vocabulary by playing games. Small proportions of students, 0.5% specifically, improve their vocabulary through learning the culture.

Using mobile applications for studying vocabulary

In order to investigate the awareness of students about making use of mobile technology for English study, the students were asked if they had ever used any mobile applications to improve their English or their vocabulary or not. The majority of the participants (85%) claimed that they did use mobile applications to improve their English proficiency or vocabulary while the remaining 15% gave a negative answer. Table 2 showed the applications that were listed by the students.

Table 2: List of mobile applications which have been used by students

Name of Online Application	Number of users	Percentage
Quizlet	22	12%
Dictionary (in general)	73	40%
Games (in general)	13	7.1%
Scribd	23	12.7%
Coursera	11	6%
Duolingo	26	14.3%
Jonny Grammar's word Challenge	9	4.9%
Others	4	3%

According to Table 2, the largest number of students used mobile applications as dictionaries of all kinds with the frequency of 40% of students. The other listed applications had pretty low frequency. Specifically, 14.3% of students listed Duolingo applications as the applications they often use to learn English. 12.7% of the subjects claimed that they just used Scribd and their language as a source of English improvement. Surprisingly, there were 12% of students who did use mobile applications to improve their vocabulary, and their application of choice is Quizlet. The applications with the lowest frequency were Games (3), Coursera (5) and Jonny Grammar's word Challenge (7). Noticeably, 3% of students said that they cannot remember the name of the applications they have used so they were put into the "Others" category. The results showed that most of the participants only used mobile dictionaries. However, it also shows that they did use mobile applications to improve their English in some way. As a result, it is highly expected that the Memrise will draw their attention.

Data collected from treatment with Memrise

The participants were divided into two groups: one experimental group and one control group. This data was collected from the experimental group after two months using Memrise. The data from the post-usage questionnaires were also grouped into four main parts consisting of the students' first impression about Memrise, students' self-study of vocabulary with Memrise, and students' attitudes towards Memrise as a mobile application after using it.

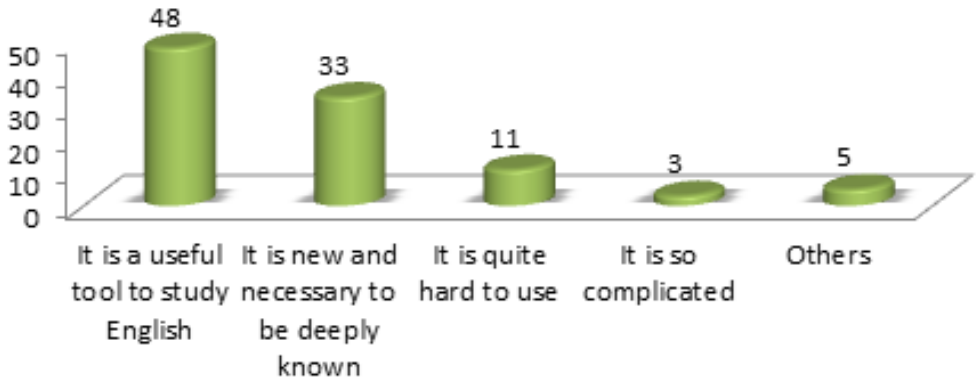

Figure 2: Students' first impression about introduced Memrise mobile application

As can be seen in Figure 2, the largest percentage (48%) belongs to the impression that Memrise is a useful tool to study English. Next, 33% of the students thought that Memrise was

new and necessary to be known thoroughly. The other impressions just accounted for a small portion. To be specific, 11% of the students said that this application was quite hard to use. Only 3 students (3%) claimed that the software was so complicated and 5% of the participants had other impressions of the software. From the result, it can be concluded that Memrise gives a positive impression on most of the students participating in the study.

Usage of Memrise mobile application: The assessment of students of Memrise mobile application

The quality of Memrise mobile application

The introduction of Memrise attracted 100 different users and also received different rates of quality. Figure 3 expresses how students rated this software according to the scale from very good to very poor.

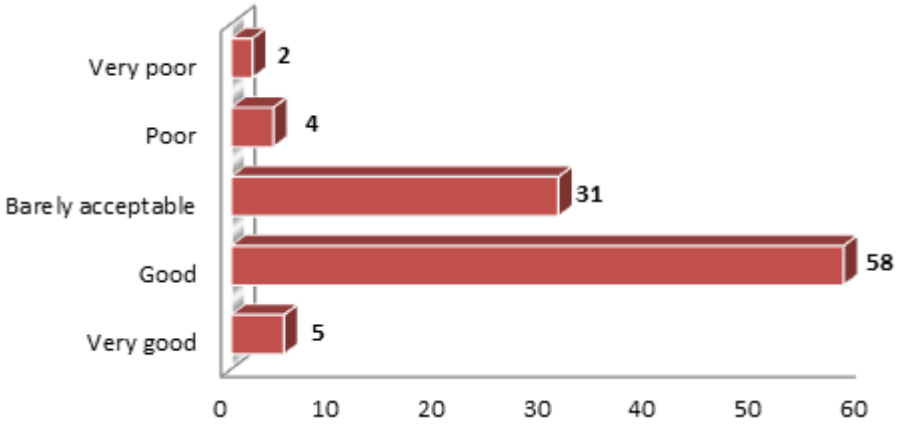

Figure 3: The quality of Memrise rated by students

We can easily recognize the majority of 100 users had positive opinions about Memrise mobile application. To be specific, 58% of students thought that this was a good software and 5% student rated this application "very good". 31% of students had a neutral look toward this application since they rated it "barely acceptable". The negative opinions only held a small portion of the users, 4% for "poor" rating and 2% for "very poor" rating respectively.

Good points and bad points of Memrise

To find out explanations for the rate of quality, the researcher asked students to list the good points and bad points of Memrise. However, it is important to take notice that some users had no comment about this issue, but some students listed a few good points and bad points for Memrise.

Table 3 presents the good points of Memrise, from the point of view of 100 students using this tool.

Table 3: Good points of Memrise

Good point	Number of supporters	Percentage
The topics are diverse	21	21%
It is easy to use	13	13%
It is flexible	15	15%
The topics are interesting	19	19%
Great variety of vocabularies	47	47%
Great variety of vocabularies' examples	57	57%
It helps to learn from the locals through video	43	43%
It helps the learner be get used to native speakers' accent	11	11%
Develop both vocabulary and listening skill	14	14%
It provides variety of exercises	17	17%
It provides the number of reviews in all sessions	56	56%
It can learn offline	2	2%
The speeds are very easy to catch up	18	18%
Its level is suitable with learner's ability	46	46%
It is interesting	79	79%
It is effective to improve vocabulary	86	86%
It helps to build your own vocabulary list	16	16%

According to Table 3, there are 17 good points of Memrise. To be specific, 86% of students agreed that Memrise is effective in improving vocabulary. 79% of students were interested in this mobile application. Next, over half of the students thought Memrise had a great variety of vocabularies' examples (57%) as well as providing reviews in all sessions (56%). Nearly half of students pointed out good features of Memrise were its great variety of vocabularies (47), its level is suitable with learner's ability (46%), and its system for learning from the locals through video (43%). What is more, nearly one fourth students were in favor of the diverse topics (21%) and interesting topic (19%), the variety of exercises (17%) and the easily-catch-up-speech (18%) offered by Memrise as well as helping to build own vocabulary list (16%). A noticeable number of users believed that Memrise was flexible (15%), easy to use (13%) and it helps to develop both vocabulary and listening skills (14%), be get used to native speakers' accent (11%). Finally, 2 students agreed that learning offline was a good point.

Regarding bad points, there are 8 ones. The first drawback is the requirement of Internet connection to use the software (38 users). However, 1 student feels it is too difficult to use this software. Another noticeable disadvantage is some features are just for pro members with 36% of students agreeing on this. 9% of participants thought that the questions in the application are too easy. One more complaint about the software is that it is time-consuming (7% of students). The other bad points only take a small portion with 4% students who thought that the speed pronunciation of some vocabularies was too fast; other 3 students believed the levels were not divided clearly and 2% students complained the speed of downloading was too slow.

Effectiveness of Memrise rated by students

On being questioned whether Memrise was helpful in improving vocabulary or not, 98% of students answered "Yes" and 2%students answered "No". Those who answered "Yes" are required to rate the effectiveness of Memrise on the skill. The result is shown in Figure 4.

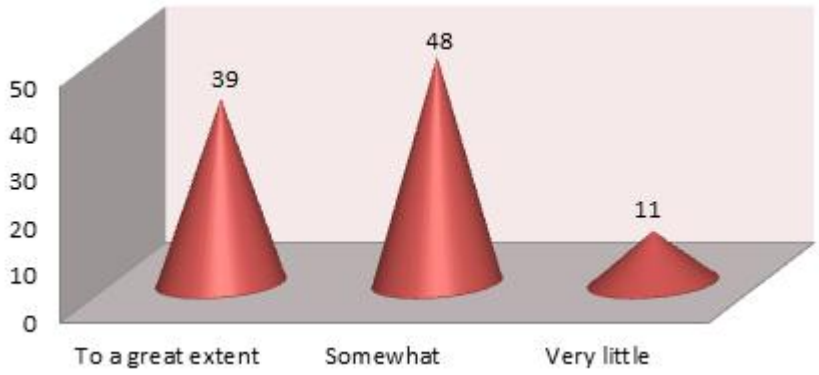

Figure 4: The effectiveness of Memrise on vocabulary rated by students

From the figure, the largest scale belongs to "Somewhat" with 48 students. A considerable number of participants (29) stated that this software is helpful to their vocabulary learning to a great extent. Besides, 11 users said that this application was only a little help. We can easily recognize that it is a positive point that 98% of this research's subjects believed that a mobile application was helpful to their study to some extent.

Students' attitudes towards applying Memrise mobile application in English vocabulary study

Table 4: Students' attitudes towards Memrise in the second stage

Statement	Scale	Frequency	Percentage	Total
Applying Memrise is an effective way to improve English vocabulary	Strongly disagree	0	0	100
	Disagree	3	3	
	Neither agree nor disagree	20	20	
	Agree	53	53	
	Strongly agree	24	24	
It does not require a high level of mobile devices understanding to use Memrise	Strongly disagree	19	19	100
	Disagree	13	13	
	Neither agree nor disagree	20	20	
	Agree	38	38	
	Strongly agree	10	10	
It takes a lot of time when applying Memrise to improve vocabulary	Strongly disagree	15	15	100
	Disagree	54	54	
	Neither agree nor disagree	19	19	
	Agree	9	9	
	Strongly agree	3	3	
Applying Memrise motivates English learners to study harder	Strongly disagree	3	3	100
	Disagree	8	8	
	Neither agree nor disagree	23	23	
	Agree	57	57	
	Strongly agree	9	9	
Applying Memrise is a method more preferable than books to improve English vocabulary	Strongly disagree	2	2	100
	Disagree	15	15	
	Neither agree nor disagree	34	34	
	Agree	29	29	
	Strongly agree	20	20	
It is not necessary to apply Memrise in learning vocabulary	Strongly disagree	20	20	100
	Disagree	37	37	
	Neither agree nor disagree	29	29	
	Agree	10	10	
	Strongly agree	4	4	

The results from Table 4 provide us a clear view about attitudes of students towards applying Memrise in learning vocabulary after using it for 2 months. Firstly, no students strongly disagreed with the first statement and only 3% of students disagreed with the idea. The majority of the students (77%) were in favor of the idea that applying Memrise was an effective way to improve vocabulary. 20% of students gave no opinion when being asked if they agreed with the statement or not. When being asked if they think there was no need for a high level of understanding of mobile devices to use Memrise, 38% of the students agreed and 10% of the participants strongly agreed with the idea. The total portion of positive opinions is 48%, which is remarkably higher than the portion of students who gave negative opinions (32%).

Time-consuming is one of the bad points listed by the participants. However, only a small portion of 11 students supported this idea while the number of students who opposed this opinion is much higher (69 students). 19% of students were neutral to this statement. Next, 66% of the participants agreed that applying Memrise mobile application motivated students to study harder while 11 students are against this idea.

Our test results also indicate that Memrise as a mobile application is more preferable to books and CDs to Vietnamese students. Most students agree with this opinion with 29% of participants agreed and 20% strongly agreed, the portion of students who were against this idea was 17% and the proportion choosing neutral to this opinion was 34%.

The statement that it was not necessary to study vocabulary with Memrise received mostly negative responses with 57% of participants were opposed to this idea. Only 14% of students supported this statement and 29% remained neutral.

Information collected from the vocabulary test

Two vocabulary tests for evaluating students' vocabulary consist of two sub-tests: pre – usage test and post-usage test. These tests called The Vocabulary Size Test were designed by Prof Paul Nation, Emeritus Professor in Applied Linguistics at the School of Linguistics and Applied Language Studies (LALS) at Victoria University of Wellington, New Zealand (Nation, P., & Crabbe, D. (1991). Both participants in the control group and experimental group were required to do the pre-usage vocabulary test. After 2 months, the experimental group was required to do the post-usage vocabulary test.

According to the vocabulary level of learners of The Vocabulary Size Test, there are 3 three levels of learners including high frequency (1000-2000 word family lists), mid-frequency (3000-9000 word family lists), low frequency (10,000 on word family lists). A learner's total score on the 140-item test needs to be multiplied by 100 to find the learner's total vocabulary size. On the 100 item versions measuring up to the 20th1000 word family level, there are five words for each 1000 word family level, so the total score needs to be multiplied by 200.

There is a significant improvement level of the vocabulary of students that is shown in Figure 9.

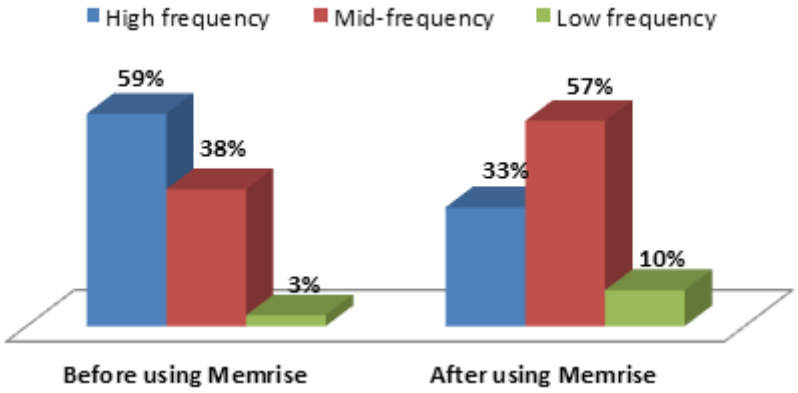

Figure 4: The comparison vocabulary level of learners before and after using Memrise

According to Figure 4, the result showed that there were noticeable changes between before and after using Memrise. The percentage of high frequency sharply decreased, from 59% to 33% while percentage in the mid-frequency rose steadily from 38% to 57%. Finally, the proportion of low frequency after using Memrise is slightly higher than before.

FINDINGS AND DISCUSSION

The Impacts of Memrise on Students

This part was divided into three parts, equivalent to three impacts that this software has, as the impact on vocabulary, the impact on learners' attitudes, and the impact on the duration of learning vocabulary.

The Impact of Memrise on Studying Vocabulary

Based on the data results, the first impact of Memrise is that it helps increase vocabulary. Although the figures from the tests mentioned in the previous part are not convincing enough that Memrise helps improve vocabulary, using this software is still recognized as an effective method by 77% of participants. This portion is much higher than the number of those with opposing opinions (3%). Furthermore, it is clear that 87% of students agree that Memrise is helpful to their vocabulary study to certain extents. Moreover, we can see a number of advantages and a considerable amount of these advantages' supporters.

This application helps students to learn vocabulary in a variety of ways. The students can learn the vocabulary with a number of topics as well as practicing again with many kinds of reviews and exercises. The students can also learn the pronunciation made by the native speakers and many kinds of examples. Moreover, with the variety of topics provided, learners can build their own vocabulary lists, the most essential part of learning English.

The impact of Memrise on Students' Attitudes towards Applying Mobile Applications

In general, students show significant changes in their attitudes after 2 months of using Memrise. In fact, learners show positive thought after experiencing the mobile application.

First of all, the number of students who advocate applying Memrise in studying as an effective method for learning vocabulary increase from 22.5% to 77%, the number of students who are unsure about this decreases to 43% students and those who disagree decreases to 11% students. Additionally, 11% of the students have a negative thought about Memrise application of that this consumes too much time. Moreover, the attitude of students about the necessity of Memrise for improving vocabulary is also changed. Before being introduced to Memrise, 35.5% of the students used to think it is not essential to practice with Memrise applications, but this number increases to 57% two months and a half later. It means more students realize the importance of Memrise application in learning English vocabulary.

Factors affecting the effectiveness of learning vocabulary with Memrise

From the results, it can be concluded that there are two main factors.

Subjective factors

The poor effectiveness of Memrise mobile application using comes from learners' negative attitudes. Although most students have a good impression with the introduced Memrise such as "Memrise are useful software for English study" or "Memrise need to be deeply know". However, it is undeniable that few students have negative prejudices about the application. They suppose Memrise is quite hard to use or too complicated. These impressions indicate that students are not willing to try to use the mobile application. When the students are asked to explain their no using, they claimed that it is not effective as other sources despite them not testing it before. Moreover, they also have a prejudice that Memrise is not interesting. 70% of these students got a lower score in the second vocabulary test. In the addition, the number of

students who do not believe in either the effectiveness or the necessity of applying mobile applications makes up 25% of learners who have bad results in the second vocabulary test.

Objective factors

The ineffectiveness of the application might also come from its own limitations. As seen in the findings, 38% of users complained that the application always needs Internet access to use, and it is not convenient.

Another considerable limitation is the features of Memrise. Some features just are for Pro member, the user must pay 349,000 VND to become Pro member and using all the features of Memrise. However, these kinds of problems always appear in most mobile applications nowadays.

Suggestions for using Memrise to improve English vocabulary learning

From the study's results, it can be generalized that Memrise is really useful to English learners, especially in terms of vocabulary learning. However, for most students in Vietnam, they have learnt English at least for nine years, but many of them do not have a good command of English, especially they do not have sufficient vocabulary to support their fluency. Memrise should be a good choice. Students can use this application directly on their mobile devices, which is quite popular in Vietnam now so that they can improve their English in general and their vocabulary in particular without any restriction related to learning materials, time, and place. Besides, with the specific features of Memrise, students could learn vocabulary in their own space. In turn, Memrise can also promote students in self-regulated cycles of learning (Kramarski & Gutman, 2006).

CONCLUSION

This study was conducted to find out some impacts of Memrise as mobile applications on vocabulary learning of students of the Department of English of the University of Foreign Language Studies, Da Nang University, Vietnam. Furthermore, it aimed to explain the possible factors influencing the effectiveness of mobile applications and to suggest an effective application for learning vocabulary. From the result analysis and interpretation, particular fundamental conclusions can be drawn as follow:

- Students nowadays have more advantages in applying technological innovation than those in the past when it is easier for most students to access the Internet at home and enjoy its benefits. With the changing method of teaching languages, learners of English themselves are more aware of making use of the advantages of online applications for vocabulary self-improvement. In addition, just a few of English students really see online mobile applications as a reliable method. The rest still tend to choose other more familiar methods. For example, for studying vocabulary, most students choose to learn from the materials provided from by teachers or from dictionaries or books.
- In addition, mobile learning is a potential method of language learning due to the flexibility of mobile devices allowing it to be used anytime and anywhere. With advanced technology nowadays, students can just access resources from the Internet through a mobile device instead of using an expensive laptop or computer. With the development of mobile technology, a lot of language learning applications have been created. However, in the context of the University of Foreign Languages Studies, Da Nang University, most students

only use digital dictionaries on their mobile devices instead of exploiting the full potential of their mobile device with many other useful applications such as Memrise.

- Memrise as a mobile application does help students improve their vocabulary and its effectiveness is confirmed through our survey and tests. After having a clearer view about this application, students find that applying Memrise in learning vocabulary does not require a high level of mobile devices using skills but the investment of time. Although the majority of students conclude applying Memrise in studying vocabulary is an effective method to learn and practice, they are still confused if this method is more preferable to traditional methods.
- With regard to the ineffectiveness of using Memrise, the researcher realizes that it is caused by some factors. Firstly, some students cannot improve their vocabulary because of their negative attitudes towards this application. Next, their frequency of using the software and their limited mobile devices using skills also are contributing factors. Additionally, there are also obstacles to the limitations of the application. As has been mentioned, the results in Memrise application are generalized for mobile applications to enhance vocabulary of students because of the scope of this study.

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THE EFFECTS OF DIGITAL GAME-BASED LEARNING USING MINECRAFT TOWARDS PUPILS' ACHIEVEMENT IN FRACTION

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ABSTRACT

The ability to understand and master concepts of fractions will provide a solid basis for understanding more complex mathematical concepts which in turn will assist in solving problems involving fractions in everyday life. However, findings of the international assessments Trends in Mathematics and Science Studies (TIMSS) and Program for International Student Assessment (PISA) indicated that the achievement of fractions among pupils in Malaysia is at a poor level, which is below the international average score. In considering the rapid development and advancement of digital games, the purpose of this study is to investigate the effect of DGBL using Minecraft on pupils' achievement in fractions. A quasi-experiment with a pre-test and post-test nonequivalent groups was conducted involving 65 Year Five pupils in two intact classes. Through cluster sampling, one class was selected as the treatment group while the other class was selected as the control group. The treatment group which consists of 31 pupils was exposed to DGBL using Minecraft while the control group which consists of 34 pupils was exposed to conventional methods. Data were analyzed using an independent sample t-test to compare the post-test achievement score mean for fraction between the treatment group and the control group. There was a statistically significant difference in the achievement scores mean between the treatment group (mean=8.80, SD=2.77) and the control group (mean=6.20, SD=2.79). The findings from this study would further encourage the use of digital games, especially Minecraft, in the teaching and learning of fractions so as to increase pupils' achievement.

Keywords: DGBL, Minecraft, concepts of fractions, achievement

INTRODUCTION

Fractions are complex but important concepts in mathematics. Understanding of the concepts of fractions is important not only to provide a solid foundation for the formation and development of mathematical ideas (Zakiah et al., 2013) but also to assist in the mastery of other more complex mathematical concepts such as algebraic concepts (Booth et. al., 2014). Furthermore, having a solid knowledge of the concept of fractions will help in solving everyday problems especially those that involve calculations and measurements such as percentages, ratios, rates as well as decimals (Abdul Halim et. al., 2015; Booth et. al., 2014; Ndalichako, 2013; Wijaya, 2017). In Malaysia, based on the mathematics curriculum in the Kurikulum Standard Sekolah Rendah (KSSR), the topic of fractions has been introduced to pupils since Year One (Kementerian Pendidikan Malaysia, 2015). "Fractions" is one of the topics in the domain of Numbers and Operations and is taught after the topic of whole numbers.

Although exposed at an early age, most Malaysian pupils are still having difficulties in learning and mastering the topic. Difficulties encountered in learning fractions have resulted in Malaysian pupils obtaining unsatisfactory level of achievement in fractions (Abdul Halim *et. al.*, 2015). Reports in TIMSS and PISA assessments showed that the average achievement score of Malaysian pupils in mathematics was below the international average score, in which fractions are among the topic tested in the Number domain. Malaysian pupils obtained an average score of 474 in TIMSS 2007, 440 in TIMSS 2011 and 465 in TIMSS 2015 as shown in Table 1. These average scores were well below the international average score of 500 based on the TIMSS International Benchmarks of Mathematics Achievement in Table 2. Based on these scores, Malaysia's performance in TIMSS had slipped to the Low International Benchmarking of Mathematics Achievement (Mullis et al., 2016), an indication that despite investing heavily in education, the return on educational investment in Malaysia was not as high as expected. In PISA 2009 and PISA 2012, Malaysian pupils achieved a score of 404 and 421 in Mathematics Literacy respectively, which was again below the international average score of 548 (Abdul Halim *et. al.*, 2015; OECD, 2013).

Table 1: Malaysia's mathematics average achievement score in TIMSS based on year taken

Year Taken	Average Score
2007	474
2011	440
2015	465

Table 2: TIMSS International Benchmarks of Mathematics Achievement

Level of International Benchmark	Average Score
Advanced International Benchmark	625
High International Benchmark	550
Intermediate International Benchmark	475
Low International Benchmark	400

One of the reasons that contribute to the decline in Malaysia's performance in both international assessments is the pupils' inability to fully grasp the conceptual understanding of fraction, as a result of misconceptions caused by the concepts of whole numbers. Based on the content of KSSR for mathematics, the topic of fractions is taught after the pupils are exposed to whole numbers and the basic operations of addition, subtraction, multiplication and division as well as the combined operations in the Numbers and Operations domain (Kementerian Pendidikan Malaysia, 2014; Noorbaizura & Leong, 2013). The pupils' prior learning of whole numbers and the manner in which fractions are introduced to them at the early stages of

learning of fractions may have affected their conceptual understanding of the proper algorithm to use when solving operations of fractions. They tend to get confused between concepts of fractions and concepts of whole numbers. For instance, in questions involving the addition and subtraction of fractions, the pupils were treating numerators and denominators as separate entities. Pupils assume that the numerator and denominator were two separate integers rather than two numbers that have a relationship with each other (DeWolf & Vosniadou, 2015), thus affecting their ability to solve operations of fractions correctly.

Pupils are simply adding or subtracting the numerators and denominators as they were provided (Dhlamini & Kibirige, 2014; Li, 2014; Loong, 2014; Ndalichako, 2013). It should be noted that when adding or subtracting fractions that have the same denominator, the denominator is maintained and when the denominators are different, the fractions should be converted to equivalent fractions before the operations are carried out. Below are examples of the misconceptions caused by the concepts of whole numbers:

$$\frac{1}{3} + \frac{2}{3} = \frac{3}{6} \quad \text{and} \quad \frac{3}{5} + \frac{2}{3} = \frac{1}{2}$$

These findings clearly showed that pupils lack the conceptual understanding of the concepts of fractions (Almeda & Dy., 2013; Azurah & Effandi, 2015; Bottge et al., 2014; Zakiah et al., 2013). As a result, pupils are bound to find fractions confusing and easily mix them up since they don't have a clear understanding of what fractions and operations of fractions mean. In order to strengthen the pupils' conceptual understanding of fractions and at the same time improve their achievement in fractions, DGBL is seen as an appropriate approach and should be applied to achieve the goals stated above, especially through the use of Minecraft.

LITERATURE REVIEW

Digital games are highly sought after every year, thus, turning the digital games industry into a billion-dollar industry (Malaysian Investment Development Industry, 2020). The Entertainment Software Association (2019) estimated that the sales value of digital games in 2018 in the United States itself exceeds 43.3 billion USD. As many as 165 million or 65% of the adult population in the United States, spanning various age groups, races and genders, play digital games. The average age of individuals playing digital games were 33 years, with the average time spent playing digital games approximately 8.3 hours per week. According to Wijman (2020), the global digital games market will generate a high revenue by 2020 with the reason being that digital games offer something that is highly sought after by every individual; entertainment and satisfaction (Ritterfield & Weber, 2006). The elements of entertainment and satisfaction offered by digital games have contributed to the increasing demand for digital games due to the ability of digital games to attract attention and encourage engagement as well as immersive in nature; reasons as to why people spend long hours playing digital games (Kirriemuir & McFarlene, 2004).

Realizing that digital games are able to trigger high demand among various groups of individuals regardless of gender, ethnic background (Bickham et al., 2003) as well as age (IDSA, 2003), there have been efforts among educators to integrate digital games into the educational environment especially in teaching and learning with the hope that digital games can support and encourage more active involvement of pupils in learning so that the intended learning objectives can be achieved. The integration of digital games into the learning environment has resulted in a teaching and learning method known as DGBL.

DGBL has gained much attention in the educational setting over the past 20 years

(Aishah & Connolly, 2013; All et al., 2014; Boyle et al., 2016; Li & Tsai, 2013; McLaren et al., 2017; Westera, 2015). There is no exact definition to specifically describe DGBL (Huizenga, 2017; Wong & Kamisah, 2018); DGBL is usually defined based on some common features. According to All et al., (2017), DGBL is the use of digital games for educational purposes that combine both entertainment and educational elements. Al-Azawi et al., (2016) define DGBL as the integration of digital games in the teaching and learning session with the aim of enhancing learning experience. As a teaching and learning method that promotes learning through play (Hwang et al., 2015; Yang, 2015), DGBL is applied to make the learning environment more enjoyable than conventional methods (Wang et al., 2011). According to Prensky (2001) and Wiggins (2016), DGBL is a teaching and learning method that involves the combination of game features with teaching content with the goal of achieving the learning objectives. DGBL has the potential to facilitate the development and enhancement of learning performance as this learning method is capable of providing interesting learning experiences that challenge the abilities, encourage engagement and trigger motivation which in turn increase pupils' interest in the subject taught by teachers (Chang et al., 2012; Meluso et al., 2012; Siew et al., 2016). All these features indicate that DGBL promotes pupils-centered learning strategy through the integration of technology into the education system. Pupils-centered learning is a teaching strategy that provides pupils the opportunity to participate actively in the learning process (Bell & Lygo-Baker, 2017) thereby enabling pupils to be more involved in the lesson as the teacher does not dominate the teaching and learning session. This is turn will encourage pupils to develop and generate ideas in order to solve a particular problem.

Most of the studies conducted on DGBL involved various variables such as engagement (Annetta et al., 2010), motivation (Iacovides et al., 2011), learning performance (Chen et al., 2012), cognitive (Kim et al., 2009), creativity (Behnamnia et al., 2020) academic achievement (Chen, 2017; Siew et al., 2016; Yeh et al., 2017) as well as involving a variety of subjects such as English (Yeh et al., 2017), Geography (Khairuddin et al., 2017), Physics (Kao et al., 2017), Mathematics (Ku et al., 2014) and social science (Hwang et al., 2015), All et al., 2014). Specific to the academic achievement, although several studies have been conducted, empirical findings regarding the effect of DGBL on improving pupils' academic achievement needs to be further explored (All et al., 2017). DGBL is seen to have the potential to improve academic achievement considering the ability of this learning method to provide interesting learning experiences, challenge abilities, encourage engagement and generate motivation which will increase pupils' interest in teaching and learning sessions, thus improving academic performance (Chang et al., 2012; Meluso et al., 2012; Siew et al., 2016).

Minecraft as a digital game

Minecraft is a popular 'sandbox' game with over 100 million units sold worldwide. The virtual world created in Minecraft is a 3D block world where players were able to explore and build independently with no clear objectives or targets to be achieved, typical of an open world game (Donellan, 2019). In a virtual Minecraft world, players use various types of blocks, which are cube-shaped, to build various types of objects as well as structures. Minecraft has been used as a teaching tool for a variety of topics and subjects around the world (Ellison, 2016; Short, 2012). Educators have identified several benefits of using Minecraft as a teaching tool and these benefits cover a wide range of fields and subjects such as mathematics (Bos et al., 2014). For example, Minecraft allows a pupil or player to collect, break, reconstruct, remove and place random 3D blocks in a virtual world in order to form any object or structure according to the imagination of the player (Bos et al., 2014; Ekaputra et al.,

2013; Kim & Park, 2009; Lane et al., 2017; Mojang, 2015; Nebel et al., 2016). The ability to manipulate the elements in this virtual world would act as a stimulus for various activities or learning projects and are entertaining and fun at the same time.

Learning of fractions using Minecraft

Most pupils have difficulties in understanding the basic concepts of fractions especially the relationship between the numerator and denominator as well as the concept of equivalent fractions (Rodrigues et al., 2017; Siegler & Pyke, 2013). According to Stafylidou and Vosniadou (2004), pupils view fractions as a pair of numbers representing a particular quantity without understanding that there is a relationship between the two quantities. This misconception has resulted in pupils not having good conceptual understanding and knowledge of fractions (Simon et al., 2018; Zakiah et al., 2013). The use of Minecraft is seen as having the potential to strengthening the conceptual knowledge of fractions as Minecraft allows hands-on manipulation activities to be performed on blocks in the virtual world of Minecraft especially in performing fractional problem solving. In Minecraft, blocks can be arranged to produce structures or objects that represent fractions known as fraction models. Fraction models allow pupils to visualize the value of fractions more easily and clearly which in turn helps them to have a better understanding of the concepts of fractions. For example, in Figure 1, two red blocks placed on top of a transparent block will form a fractional model with a value of $\frac{2}{3}$. The interpretation of the arrangement of blocks is that the three blocks show the value of the denominator while the two red blocks show the value of the numerator. Through hands-on manipulation of these blocks, activities related to basic operations such as adding, subtracting and multiplying of fractions can be performed in Minecraft. This hands-on activity will help to create a relationship between the activity and the concepts of fractions because by performing activities that involve hands-on manipulations, the pupils' mathematical skills will be improved and this in turn helps them to better understand abstract mathematical concepts since they can visualize the concepts clearly in their mind (Holmes, 2013; Kontaş, 2016). Manipulations on materials either in the form of concrete objects or virtual forms will help strengthen the understanding of mathematical concepts (Hartshorn & Boren, 1990). The pupils will also be able to develop complex knowledge through active engagement with manipulatives (Bruner, 1977; Dienes, 1973; Piaget, 1965). Figure 2 shows a fractional problem-solving activity that can be prepared by teachers in Minecraft.

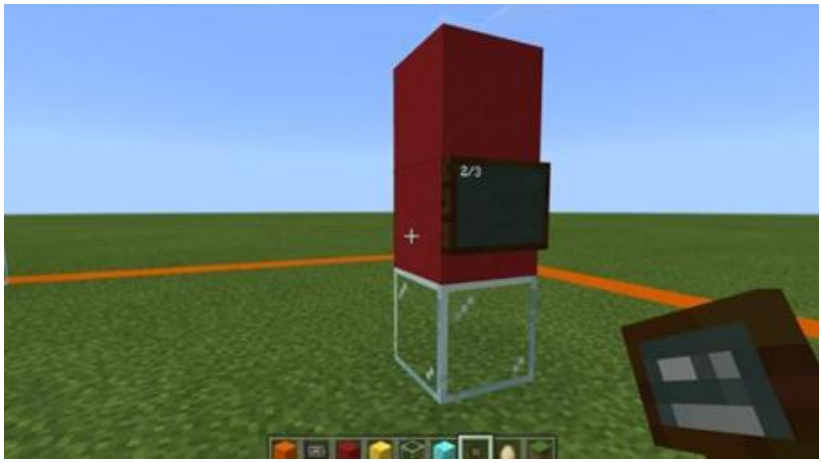

Figure 1: Arrangement of blocks that form the fraction model $\frac{2}{3}$

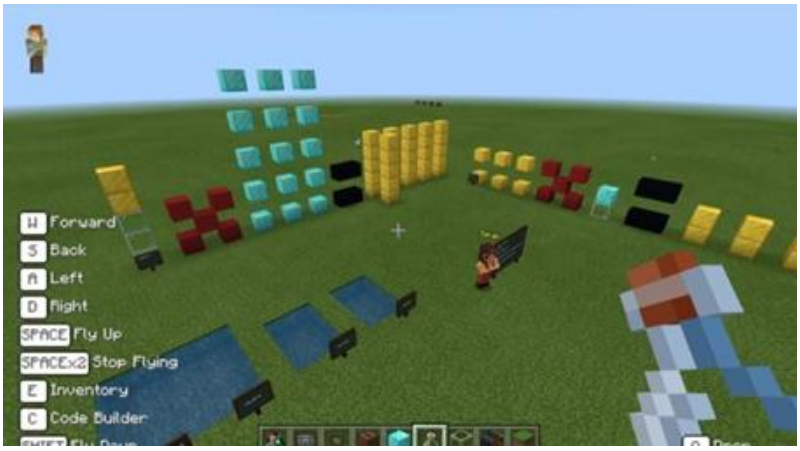

Figure 2: Problem-solving activities using fraction models

Therefore, this study aims to identify the impact of DGBL using Minecraft in improving the achievement of Year Five pupils in fractions. This study was conducted in a primary school in Sabah with the following research hypotheses:

H_o1: There is no significant difference between the pre-test and post-test achievement score mean for the topic of fractions in the control group.

H_o2: There is no significant difference between the pre-test and post-test achievement score mean for the topic of fractions in the treatment group.

H_o3: There is no significant difference in the post-test achievement score mean for the topic of fractions between the control group and the treatment group.

METHODOLOGY

Research design and sample

This study uses a pre-test and post-test quasi-experimental nonequivalent group design. The sample consisted of 65 Year Five pupils from two intact classes in a primary school in Kuala Penyu, one of the districts in Sabah. Through cluster sampling, a class containing 31 pupils was selected as the treatment group while another class containing 34 pupils was selected as the control group. The treatment group was exposed to DGBL while the control group was exposed to conventional teaching methods. The duration of the study was nine weeks, in which the teaching and learning sessions were conducted for 7 weeks that involved the addition, subtraction as well as the concept of 'from' in fractions, which is equivalent to multiplication of fractions, after the pre-test was administered to both groups. The post-test was administered in week nine after the completion of the teaching and learning session.

Instruments

The instruments for this study consisted of a pre-test and a post-test. The items developed in both instruments were based on the Year Five Mathematics Curriculum and Assessment Standard Document (DSKP) and textbook which covered the topics of addition, subtraction and the concept of 'from' in fractions. Both these instruments contained 15 subjective items that tested pupils' fractional problem-solving abilities. Similar items were used in both instruments which differed only in the numbering arrangements of items in the post-test. The pre-test was

administered to the samples prior to the treatment. The post-test was administered to measure the effect of the treatment, i.e. whether there was any improvement in the findings. Four Mathematics experts were consulted for the purpose of reviewing both instruments. Expert review is necessary to ensure the accuracy and clarity of the content of the tests to be administered (Kline, 2005).

Research procedure

The study was carried out for nine weeks, of which the teaching and learning sessions were conducted for seven weeks. Prior to the study, training regarding the administration procedures for the pre-test and post-test as well as on how to utilize Minecraft in the teaching and learning of fractions was conducted for two weeks in five sessions with the Mathematics teacher who will be involved in carrying out the lessons. Upon completion of the training, the pre-test was administered to both groups. This was followed by the teaching and learning of fractions from week two until week eight. In the treatment group, the teaching and learning of fractions involved carrying out fractional problem-solving activities in several Minecraft worlds in which the activities were created. The post-test was administered to both groups in week nine after the lessons were completed. Table 3 shows a list of Minecraft worlds that contain the activities.

Table 3: List of Minecraft worlds and the descriptions of the related fractional problem-solving activities

Minecraft World	Descriptions
Introduction to fraction model	A world where fractions are shown in the form of a model through the manipulation of blocks.
Proper fractions	A world where examples of proper fractions are shown through the manipulation of blocks.
Improper fractions	A world where examples of improper fractions are shown through the manipulation of blocks.
Equivalent fractions	A world where examples of equivalent fractions are shown through the manipulation of blocks.
Mixed fractions	A world where examples of mixed fractions are shown through the manipulation of blocks.
Addition of fractions	A world that shows how fractions are added. The addition of fractions includes proper fractions, improper fractions and mixed fractions.
Subtraction of fractions	A world that shows how fractions are subtracted. The subtraction of fractions includes proper fractions, improper fractions and mixed fractions.
Multiplication of fractions	A world that shows how fractions are multiplied. The multiplication of fractions includes proper fractions, improper fractions and mixed fractions.
Hands-on with addition of fractions	A world where pupils perform problem-solving activities involving the addition of fractions through the manipulation of blocks.
Hands-on with subtraction of fractions	A world where pupils perform problem-solving activities involving the subtraction of fractions through the manipulation of blocks.
Hands-on with multiplication of fractions	A world where pupils perform problem-solving activities involving the multiplication of fractions through the manipulation of blocks.

FINDINGS

Data were analysed using SPSS. Results of the analysis are shown as follows:

Hypothesis $H_0$1: There is no significant difference between the pre-test and post-test achievement score mean for the topic of fractions in the control group

Paired samples t-test was performed for the control group to identify the difference between the pre-test and post-test achievement score mean. Based on table 7, p = .18 is greater than the significant value of .05. Therefore, there is no significant difference between the pre-test and post-test achievement score mean in the control group (t(33) = -1.35, p = .18). The null hypothesis fails to be rejected.

Table 7: Comparison of pre-test and post-test achievement score means of the control group

Marks	N	Mean	Standard deviation	Mean difference	t	df	*P*
Pre-test Post-test	34	6.02 6.20	2.75 2.79	-.17	-1.35	33	.18

*significant $p < 0.05$

Hypothesis $H_0$2: There is no significant difference between the pre-test and post-test achievement score mean for the topic of fractions in the treatment group

Paired samples t-test was performed for the treatment group to identify the difference between the pre-test and post-test achievement score mean. Based on table 8, p = .00 is less than the significant value of .05. Therefore, there is a significant difference between the pre-test and post-test achievement score mean in the treatment group (t(30) = -4.04, p = .00). The null hypothesis is rejected.

Table 8: Comparison of pre-test and post-test achievement score means of the treatment group

Marks	N	Mean	Standard deviation	Mean difference	t	df	*p*
Pre-test Post-test	31	6.93 8.80	3.15 2.77	-1.87	-4.04	30	.00

*significant $p < 0.05$

Hypothesis $H_0$3: There is no significant difference in the post-test achievement score mean for the topic of fractions between the control group and the treatment group

Table 9 shows the statistics of the post-test achievement score mean for the control group and treatment group.

Table 9: Statistics of the post-test achievement score mean for the control group and treatment group

Marks	Group	N	Mean	Standard deviation	Standard error of the mean
Post-test	Control	34	6.20	2.79	3.11
	Treatment	31	8.80	2.77	3.09

Based on Table 10, Levene's test for the equality of variances which is not significant (p = .78 > .05) showed that both the control and treatment groups have similar variances. This means that the null hypothesis which states that the variance for the control group is equal to the variance for the treatment group fails to be rejected. Thus, the comparisons of the mean of two groups of independent samples that have the same variance are considered (equal variances assumed). Since the probability value obtained (.00) is less than the value of significance (.05), the null hypothesis is rejected. There is a significant difference between the post-test achievement score mean for the control group (M = 6.20, SD = 2.79 and the post-test achievement score mean for the treatment group (M = 8.80, SD = 2.77) for the topic of fractions. The treatment group obtained a higher mean compared to the control group.

Table 10: Statistics of the post-test achievement score mean for the control group and treatment groups

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Post-test marks	Equal variances assumed	0.07	0.78	-3.6	63	0.00	-15.86	4.4	-24.66	-7.06
	Equal variances not assumed			-3.61	62.89	0.00	-15.86	4.39	-24.64	-7.08

*significant $p < 0.05$

DISCUSSION

The findings of the study indicated that the use of Minecraft in the teaching and learning of fractions had helped improve pupils' achievement compared to the use of conventional methods. Minecraft provides a platform for pupils to perform manipulations on virtual blocks when carrying out fractional problem-solving activities which at the same time provides entertainment as well as encourages the active involvement of pupils in the learning process. The element of entertainment that was brought forth by Minecraft had made learning more fun and enjoyable. This has led to pupils being more attentive and highly motivated during lessons in line with the study by Hwang et al., (2015), Yang (2015) and Wang et al., (2011).

As a technology that features heavily on graphical display, Minecraft used in DGBL has improved the conceptual understanding and mastery of fractions among the pupils and has been applied in performing fractional problem-solving. Based on the study, the use of Minecraft has helped pupils to effectively visualize the concepts of fractions. They are able to visualize the concepts of fractions easily and effectively since Minecraft allows them to perform hands-on fractional problem-solving activities through the manipulation of blocks. This is in line with the findings of Kim and Park (2018) that discover that the implementation of mathematical activities using Minecraft has improved the effectiveness of the teaching and learning of Mathematics by helping pupils to better visualize mathematical concepts in a virtual environment. Pupils can arrange, move, destroy and modify blocks in Minecraft to form fraction models and then perform fractional problem-solving through the manipulation of the blocks. Piaget (1965) had stated that pupils would often have difficulties in understanding and learning abstract mathematical concepts when presented either in words or symbols through direct explanation. This is because the pupils have not reached the cognitive maturity required to understand such abstract mathematical concepts. Thus, he argued that the pupils would be able to learn abstract mathematical concepts better and more effectively as a result of their experience of interacting with or manipulating objects as well as concrete materials. Minecraft allows pupils to visually see and interact with the blocks when carrying out fraction problem solving activities. The ability to visualize concepts of fractions well will assist in forming a strong conceptual understanding of fractions (Abdul Halim et al., 2015; Özkan et al., 2018). Hands-on manipulation activities in Minecraft helps to establish a connection between the manipulation activities and abstract mathematical concepts because when their mathematical abilities improve as a result of performing the activities, they will have a better understanding of

mathematical concepts and be able to visualize those concepts better in their minds (Holmes, 2013; Kontaş, 2016). Manipulation activities allow pupils to integrate knowledge and relate it to their thinking in order to understand mathematical concepts more comprehensively (Boggan et al., 2010; Kelly, 2006) and this contributes to the pupils' ability to solve problems involving fractions which will result in improvement in their achievements.

DGBL using Minecraft also encourage the active participation of pupils during lessons as a result of the student-centered learning nature of this learning method. Pupils will be actively involved in carrying out problem-solving activities in Minecraft since digital games are able to create interactive learning experiences by converting inactive learning materials to learning materials where students are the active players and participants (Sugar & Takacs, 1999). The active participation of pupils as a result of the use of DGBL is also due to the nature of digital games which provide a responsive environment where pupils are immediately aware of what they are doing and what is happening in the digital game (Cruickshank & Telfer, 1980). This will sustain the involvement and interest of pupils to follow lessons and the more they are actively and comprehensively involved in the teaching and learning, the more skills and knowledge they will acquire. These skills and knowledge will assist in solving problems related to fractions, thus improving their achievement in the topic.

IMPLICATION OF STUDY

The use of Minecraft especially in the teaching and learning of fractions has the potential to contribute to the creation of a virtual learning environment that is able to provide an interactive, dynamic, fun and enjoyable learning experience which in turn will make pupils more engaged and focused during lessons. Being able to gain the pupils' attention and interest in the lesson will greatly improve their learning and enable them to attain a proper understanding regarding the concepts of fractions. In addition, DGBL is able to improve the pupils' achievement in fractions, hence highlighting the need for teachers to receive guidance and training on techniques of implementing DGBL, especially in regard to integrating digital games into the teaching and learning sessions.

CONCLUSION

This study has shown that the use of Minecraft in the teaching and learning of fractions has a positive impact on pupils' achievement in fractions. The ability of pupils to solve problems involving fractions will help to achieve the aspirations of the Mathematics curriculum in Malaysia as well as further improve Malaysia's performance in international assessments such as TIMSS and PISA. Therefore, educators need to take the initiative to use DGBL considering the potential of this method in supporting and improving learning, especially in academic performance and achievement.

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USING REFLECTIVE JOURNALS FOR LEARNING ENGLISH AMONG PRIMARY SCHOOL STUDENTS VIA GOOGLE DRIVE

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ABSTRACT

Reflection is an important practice where teachers construct the meanings and knowledge that guide students' actions in the classroom. Reflective journal is advocated as a way to enhance teaching and learning. Most studies of reflective journals focus on its potential in promoting the process of teaching and learning, and the impacts of it on students' outcomes or motivation. The study used both quantitative and qualitative research approaches to examine the benefits of using reflective journals in teaching English to primary school students as well as their attitudes. It employed instruments such as questionnaires, students' reflective journals, and semi-structured interviews to collect data from 45 students at a primary school in Danang, Vietnam. The findings indicate four main benefits that reflective journals bring to primary school students. In addition, the study results showed students' positive feelings and attitudes towards writing reflective journals.

Keywords: reflection, reflective journals, benefits, primary school students, attitudes

INTRODUCTION

Along with the social changes, teaching and learning have been evolving to suit the newly emerging requirements. Furthermore, in terms of evaluating students, the grades are not sufficient to measure students' performance. Education should serve not only as a means of gathering information but also as a way to incorporate learning into our daily actions and behaviors. Therefore, teachers need a more personal approach for specific feedback to help students progress in their learning. As teachers and students are moving towards more formative assessment, new strategies of evaluation are required, one of these being the reflective journal. A reflective journal is a written paper that explains, analyzes, and transmits students' experience and encourages a multifaceted conversation with teachers (Holly, 1989). A reflective journal is not only a tool for teachers to evaluate students' learning process but also a way for students to improve their learning by themselves.

The current research investigated an effective way in which students both experience their learning and achieve mastery through the means of student self-reflection in active learning. Although the usefulness of reflective journals was recognized as early as the '80s, this method is rarely used academically, or at least there are no reports on such activities. The reason for this is that the effect of a competitive, numbers-driven culture has influenced the participation and importance of school and learning among students. As a consequence, an atmosphere of apathy and lack of importance has led to passivity for students. Also, when teachers are required to teach a multitude of learning requirements, the priority of those standards for effective learning results in the failure to teach them all effectively and students

lose their voice to engage in their own learning. Teachers fail to promote the constructive and authentic learning of all required curricula because of the relationship between learning norms and high-stakes assessment.

In Vietnam, this type of assessment is uncommon and is not used in schools much, especially in primary schools. Therefore, the current study aimed to investigate the benefits of using reflective journals in teaching English to primary school students and examine their attitudes towards writing reflective journals in order to introduce reflective journals as a new means to improve learning performance in Vietnam. The study is guided by two following questions:

1. What are the benefits of using reflective journals for primary school student's learning process?
2. What are the students' attitudes towards writing reflective journals?

LITERATURE REVIEW

Reflective Journal

A journal is "a sequential dated chronicle of events and ideas, which includes the personal responses and reflections of the writer (writers) on those events and ideas" (Stevens & Cooper, 2009, p.5). It is a style of writing that includes a record of daily life, individual thoughts and community perceptions (Hiemstra, 2001). Journals also gave access to a wealth of rich and real artefacts regarding one's personal insights about their experiences (Halbach, 2000) because journals provide elements that cannot be observed which are hidden or inaccessible (Bailey & Ochsner, 1983). Therefore, when people rethink events through writing, they see findings that are not normally visible since it is an introspective activity. Because journals allow surveillance of invisible aspects of oneself, keeping journals is a beneficial activity for humans. As the positive characteristics of journal writing were seen in a range of fields, journaling was deemed to be a fruitful activity in any educational sector.

Journals are easy to assign but difficult to score, and many of these means of personal contemplation should not be graded. They offer a means for students to share their thoughts and feelings about the service experiences during the lessons and, with guidance, reflective journals can relate personal learning to the lesson content. Nevertheless, there is a general propensity for reflective journals to become a simple record of events rather than a reflective activity in which students view service practice in the context of learning goals. Writing journals are an effective way to develop self-understanding and strengthen intra-personal skills and can be collected and checked at least three times in the semester. According to Suzanne (1995), journal reflection is a valuable reference guide for service-learning educators.

Reflective journals can be used for many different purposes. When analyzing more than one hundred journal writing papers, Moon (1999) listed and pointed out about eighteen journal writing uses. Most journals have to meet more than one purpose and the goals set by the teacher are not the same as those to be met or interpreted by the students. In terms of pedagogy, reflective journals can be used as a means of communication between teachers and students as well as a type of self-assessment.

According to Alvyda and Regina (2009), reflective journals are used for four basic purposes. Firstly, reflective journal writing is a way that accentuates desirable conditions for student's learning. It provides intellectual space which enables them to think easily and supports individual learning. Learners need to write their own journals, and they can track the process at their own speed. Writing a reflective journal offers an opportunity to collect thoughts

and see the whole knowledge-gathering system. Learning from a journal strengthens learning habits, as it allows students to deal with a lot of information or content. Secondly, journal writing promotes reflection related to profound learning methods or deep learning. In this kind of learning, the purpose of students is to improve a personal understanding of the subject and to connect it to what is already understood. Writing a reflective journal will support students' effort to understand. Thirdly, writing reflective journals helps encourage students' metacognition. It is an effective way to develop metacognitive skills which are divided into two types, self-assessment and self-management (Rivers, 2001). It is likely that much free writing in journals will contain some metacognition and if journals are structured, then metacognition can be built in. Lastly, the act of writing is associated with learning or the enhancement of learning. There is considerable literature on the relationship of writing to learning, how it forces students to clarify their thoughts, how it is a powerful form of feedback to them, how it focuses attention and tells them if they do or do not understand.

Many researchers have indicated that journal writing is used for learning development in multiple educational settings. It has been used to help the recognition and evaluation of influences that affect writers as part of scholarly study. In these diverse settings, journals have been used and formatted in several ways in learning.

The Use of Reflective Journal Writing in Learning Process

The use of reflective journals as a tool to improve the learning process has been the subject of numerous studies. O'Connell and Dyment (2006) pointed out some benefits of the reflective journal as a tool to encourage students to reflect on their own learning as well as improving their writing skills. Also, the use of reflective journals in promoting reflection and learning in nursing students after registration was examined in the study of Chirema (2007). This research indicated that reflective journal writing "can be used as evidence for the presence or absence of reflective thinking" (p.14). Moreover, it is an effective tool to promote reflecting and learning when students become more aware of their academic achievement.

Lew and Schmidt (2007) indicated that "students' beliefs about the usefulness of journal writing in enabling students to think and write effectively are related to their beliefs about improving learning through frequent journal writing, and the use of the journal writing as an impression management tool, and as a means to feedback on teamwork" (p.579). They found that using reflection journals provides a lot of opportunities not only for students to reflect on their learning but for teachers to monitor their students' learning progress through reflections as well.

Spalding and Wilson (2002) examined the reflective journals of 34 students, finding that reflective journal writing is important for them as it acts as a daily diary of thoughts and experiences, establishes and maintains a relationship with the facilitator; provides a safe outlet for frustration and anxiety; and supports internal dialogue. Similarly, Sen (2010) investigated students' reflective writing in terms of identifiable results and explored students' thinking about reflection and reflective journal writing as a process. The research showed that the most important advantage of reflective journals appeared when students "were most analytical in their reflection and expressed that in deeply analytical reflective writing" (p.91). Also, Gil-Garcia and Cintron (2002) suggested that analyzing and observing in reflective journals critically can help teachers to "critique and modify students' practice" (p.4).

Statement by Maloney and Campbell-Evans (2002), "provides opportunities for students and teachers to make practical theory explicit" (p.39) stated the relationship between reporters

and their audience. Critical review can allow students and teachers to critically change their work (Gil-Garcia and Cintron, 2002).

According to Gleaves et al. (2008), writing a reflective journal allows students to objectively examine and potentially change their own thought, perspectives, or actions. Gibbs (1988) developed an experiment that would allow students to reflect in a more systemic and organized way. This allowed students to log their thoughts in order to distinguish subjective and logical thinking about their thinking (Quinton & Smallbone, 2010). Throughout time, the systemic approach has become an experience that will enhance and affect future critical thinking (Boud et al., 1985).

The Use of Reflective Journal Writing in Language Learning

Previous research on language learning journals includes three separate intentions: exploration of language acquisition (Bailey, 1983; Schmidt & Frota, 1984; Schumann & Schumann, 1977), improvement of language learning skills (Ogawa & Hall, 2011; Porto, 2007; Trites, 2001), and review of the learning environment of learners and the circumstances under which the learning mode of learners is described (Carson & Longhini, 2002; Halbach, 2000; Mei, 2003).

With regards to the intent of journal writing to explore the mechanism of language acquisition, some researchers have used journals to observe how language learning has unfolded. For example, Schmidt and Frota (1986) performed a descriptive and empirical case study to track what had occurred in the language learning process of a target language country. They observed the process of interacting with native speakers through witnessing and documenting interactions and noticed in a journal entry that while students were aware of language learning, they could not use it in conversation. Therefore, self-understanding through the language learning process from writing reflective journals, which identified various language learning types and explored interactions in the target language culture can be obtained through journal writing.

More recently, journal writing has been actively applied for language learning in order to develop appropriate methods of teaching. Carson and Longhini (2002) used Spanish-language writing journals to explain students' use of learning strategies. Halbach (2000) has used language journals in an English course to figure out how students use learning methods and how those methods affect their learning. These two studies showed that teachers were able to track student learning process in accordance with specific elements or activities. Many studies showed that journal writing has recently been adapted as another avenue for improving valuable language learning capabilities, such as autonomy (Ogawa & Hall, 2011; Porto, 2007). Porto (2007) claimed that Spanish learners maximize autonomy by introspection in the writing of journals.

It is noticed that reflective journal writing is crucial in maximizing interaction among students, increasing motivation, and developing their critical thinking skills. Furthermore, some researchers reported that students study better in the subject by using reflective journals. However, studies on using reflective journal writing in the Vietnamese teaching context, especially in primary schools, are not abundant. Therefore, this research aimed at investigating the benefits of reflective journal writing for primary school students as well as their attitudes to help teachers encourage students to write reflective journals effectively.

METHOD AND SAMPLING

Research Design

The current study adopted the multimethod research design to fulfil the research objectives. Both quantitative and qualitative data were gathered and analyzed to address the research questions.

Participants

The participants included 45 students (22 males and 23 females) in a grade-5 class at a primary school in Danang city, Vietnam. All of them are 11 years old and have learned English as a compulsory subject since they were in grade 3. The students have similar characteristics and come from similar backgrounds. None of them has ever written a reflective journal on language learning before.

Instrumentation and Procedure

In order to answer the research questions, the following instruments were employed to collect both quantitative and qualitative data for analysis.

Questionnaire

The questionnaire was adapted from the one by Mohamed (2012) but made simpler to suit elementary school students. It consisted of 14 questions and was used to assess each student's reflection level on their experiences. The questionnaire used the 4-point scale of Likert (Strong disagree, Disagree, Agree, Strong Agree) to force the students to choose between agreement and disagreement. The questionnaire aimed to evoke students' views on the effects of reflective journal writing, strengthening and enhancing language learning, as well as exploring its importance and convenience.

Students' Reflective Journals

The journals were used for formative assessment in which the students wrote about the knowledge they learned and the activities they did during the class. They also wrote what they liked or what they needed to improve in the lessons; shared their thoughts, feelings, and experiences and evaluated their learning process. The treatment's key goal was to improve the journals as a formative assessment instrument and a tool for developing a sense of place. These student-created objects aided the research by revealing the extent and depth of thought that was taking place. To encourage the students to submit their reflective journals for each lesson as soon as possible for immediate comments, the teacher created a Google form as the online platform. The students completed the printed reflective journals and take their photos to send to the teachers via this platform.

Semi-structured Interviews

In order to increase the reliability of the study, semi-structured interviews were held to vary the source of data. The interviews were conducted in Vietnamese so that the participants could fully express their opinions. Nine questions were used to interview the students. The researcher recorded, transcribed and translated the interview transcripts into English. Ten students having

different experiences of using reflective journals were purposefully selected to participate in the follow-up interviews.

Procedure

The procedure of data collection is chronologically organized. First, at the weekly meetings, students were asked to write reflective journals about their language learning. Reflective journals were written three to four times a week for six weeks as the first data tool. The participants were required to write them in English. Next, they completed a questionnaire on their experiences after writing reflective journals. Then, ten students selected were interviewed for their entire journaling experience.

Data Analysis

Quantitative and qualitative data analysis was applied in order to answer the research questions. The data from the questionnaires were analyzed quantitatively by using SPSS 20. Descriptive analysis was used to analyze the frequency percentage and mean scores of each item in the questionnaire. Thematic analysis which is "a method for identifying, analyzing and reporting patterns (themes) within data" (Braun and Clarke, 2006, p. 79) was done to the transcripts of the semi-structured interviews.

FINDINGS

The Benefits of Using Reflective Journals

This section reports the findings to address the first research question, "What are the benefits of using reflective journals for primary school student's learning process?". The findings were derived from the questionnaires and the semi-structured interviews. Four major benefits of reflective journals were indicated.

Providing Opportunity for Students to Gain Self-knowledge

Table 1 presents the descriptive data for each item related to the aspect of how reflective journals assist students in gaining self-knowledge.

Table 1: Gaining self-knowledge by using reflective journals

Statement	M	SD	Frequency			
			Strongly disagree	Disagree	Agree	Strongly agree
1. I can remember vocabulary and structures quickly.	3.36	0.71	1 (2.2%)	3 (6.7%)	20 (44.4%)	21 (46.7%)
2. I can know what I have learned in class easily.	3.29	0.76	2 (4.4%)	2 (4.4%)	22 (48.9%)	19 (42.2%)
3. I can review the vocabulary and grammar after the class.	3.51	0.69	1 (2.2%)	2 (4.4%)	15 (33.3%)	27 (60.0%)

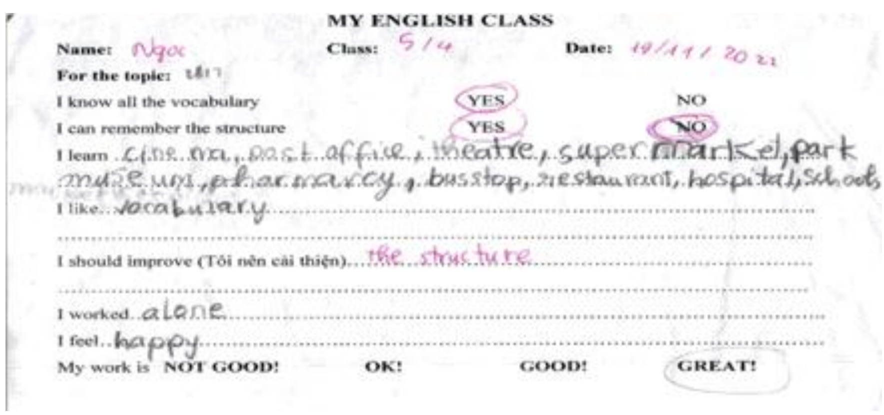
As revealed in Table 2, most of the students agreed with the notion that reflective journals' writing is a tool to help them gain self-knowledge. 21 students (46.7%) strongly

agreed and 20 students (44.4%) agreed with the statement "I can remember vocabulary and structures quickly" while only four disagreed with it. Similarly, more than 90% of the students agreed with Statements 2 and 3. This means that thanks to writing reflective journals, the students had the opportunity to recall and repeat the vocabulary and structures they had learned. The repetition of newly learned vocabulary and structures was the way to help children remember the lesson more easily. Therefore, when writing reflective journals, the students had the chance to repeat the vocabulary and structures they learned once more, helping them to learn and remember faster.

During interview, some students confirmed writing reflective journals helping them gain self-knowledge:

> **I1:** "*Writing reflective journals has helped me remember the words I learned and when I review them at home, I can memorize those words faster.*"
> **I2:** "*I can know what I learned, who I worked with and what activities I liked. I think that I film an English lesson myself by writing reflective journals*."

This can be explained that when writing reflective journals, students remembered the activities they had participated in; the vocabulary and the structure they learned; the parts that were interesting or made them feel good; the way they studied, which made it possible for them to know what they had learned in an English class, how they had studied and who they had worked with. What's more, this helped them review the new words and structures after each class by answering the questions in the reflective journal forms. An example of a student's work is shown in Figure 1.


MY ENGLISH CLASS

Name: Ngoc Class: 5/4 Date: 19/11/2021

For the topic:

I know all the vocabulary YES NO

I can remember the structure YES NO

I learn cinema, post office, theatre, supermarket, park museum, pharmacy, busstop, restaurant, hospital, school

I like vocabulary

I should improve (Tôi nên cải thiện) the structure

I worked alone

I feel happy

My work is NOT GOOD! OK! GOOD! GREAT!

Figure 1: Example of a student's reflective journal

Helping Students to Evaluate their Learning

As shown in Table 2, most of the students agreed with the two statements.

Table 2: Understanding the lesson by using reflective journals

Statement	M	SD	Frequency			
			Strongly disagree	Disagree	Agree	Strongly agree
4. I can know what I should improve in the lesson.	3.24	0.93	3 (6.7%)	6 (13.3%)	13 (28.9%)	23 (51.1%)
5. I can evaluate my learning.	3.10	0.82	2 (4.4%)	7 (15.6%)	21 (46.7%)	15 (33.3%)

In spite of being the same category which had a quite high mean value, the statement "I can know what I should improve in the lesson" had higher stronger agreement than the other with a higher rate of strongly agreement (51.1%). Furthermore, the percentage of disagreement was at a low rate (approximately 15%), which proved that the reflective journals helped the students initially evaluate their learning process, and recognize their strengths and weaknesses, as shown in an example of a student's reflective journal (Figure 1).

In the design of the reflective journal model, there were some sections where students shared what they learned; what they needed to improve (*I should improve...*) or how they worked (*My work is…*), which helped the students evaluate their learning process. For example, in the photo, the student had self-assessed whether her learning was good or not (*Great!*). Also, she saw that the point she needed to pay attention to was the structure and she should improve it. Thanks to reflective journal writing, the teacher saw what the students did not do well to have appropriate solutions to their learning problems and improve their learning outcomes.

Helping Students to Share Experiences, Thoughts and Feelings

Table 3 presents specific quantitative data related to what extent reflective journals support learners to share their experiences, thoughts and feelings.

Table 3: Sharing experiences, thoughts and feelings via reflective journals

Statement	M	SD	Frequency			
			Strongly disagree	Disagree	Agree	Strongly agree
8. I can talk about my experiences.	2.82	0.91	4 (8.9%)	11 (24.4%)	19 (42.2%)	11 (24.4%)
9. I can express my thoughts about the lesson.	3.04	0.67	1 (2.2%)	6 (13.3%)	28 (62.2%)	10 (22.2%)
10. I can express my feelings.	3.00	0.83	3 (11.4%)	6 (22.9%)	24 (48.6%)	12 (17.1%)

Regarding the category of sharing experiences, thoughts and feelings, the students had different points. As can be seen from Table 3, the statement "I can express my thoughts about the lesson" was agreed by most of the investigated students (62.2% agree and 22.2% strongly agree) while the statement "I can talk about my experiences" had a higher rate in disagreement (8.4% strongly disagree and 24.4% disagree) in comparison with two others. In the interview extract below, one participant elaborated upon the reasons why they did not like to share their experiences, thoughts or feelings:

I5: *"I find that expressing feelings is a bit difficult for me, because I'm a guy, I don't like to talk about my feelings to others, I think that girls are easier to show their feelings than boys. In addition, I prefer to talk about my own thoughts about the class, which will help the teacher know so that she can improve the lesson to suit me."*

It can be explained that because the investigated students were 10 years old, they were not aware of sharing their thoughts and experiences with others. They might feel shy, reserved, and did not want to tell their story. In contrast, there were several students who shared their thoughts, feelings and learning experiences in the reflective journals, as in one student's journal:

"… I like the song I learn today, it was very good. However, I don't like working in group because we are very slow and we don't have stickers…". (Figure 2)

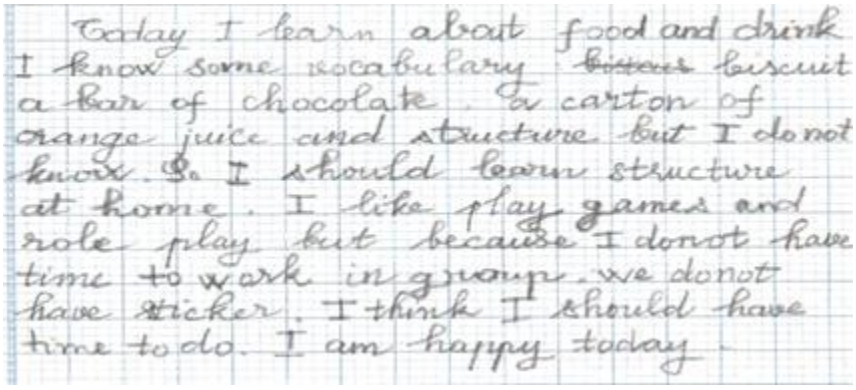

Today I learn about food and drink I know some vocabulary ~~bitcus~~ biscuit a bar of chocolate. a carton of orange juice and structure but I do not know. So I should learn structure at home. I like play games and role play but because I donot have time to work in group. we donot have sticker. I think I should have time to do. I am happy today.

Figure 2: Example of a student's reflective journal

In their reflective journals, even though they misspelled new words, wrongly used the tenses, or had words written in Vietnamese, the students stated what they liked or disliked, sharing their thoughts on how they studied or participated in the activities.

Helping Students to Communicate with Teachers

Table 4 shows that the students were generally in agreement about the benefit of reflective journals helping students to communicate with teachers.

Table 4: Communication between students and teachers through reflective journals

Statement	M	SD	Frequency			
			Strongly disagree	Disagree	Agree	Strongly agree
6. The teacher helped me out with the parts I was weak at based on what I wrote in my reflective journal.	2.89	0.85	4 (8.9%)	7 (15.6%)	24 (53.3%)	10 (22.2%)
7. The teacher adjusted the lessons to suit my wishes in reflective journals.	2.93	0.83	3 (6.7%)	8 (17.8%)	23 (51.1%)	11 (24.4%)

Both of the two statements "The teacher helped me out with the parts I was weak at based on what I wrote in my reflective journal" and "The teacher adjusted the lessons to suit my wishes in reflective journals" had a high rate of 75.5% in agreement while the opposite opinion was 24.5%. This means that reflective journal writing becomes one of the convenient ways for students to communicate with their teachers. Figure 3 shows a student's journal that demonstrated help by the teacher.


Unit 18
To day I learned about the weather. It was quite easy with me because I know all the new word I like the song I learn learn tody it was very good. However, I don't like working in group because we are slow and we don't have stickers. Teacher is pretty today.

Figure 3: Example of a student's reflective journal

In the journal example (Figure 3), the student mentioned the things which she liked *(games and role-playing activities*) or she did not like (*not having much time to work in groups with friends*), and also the points she needed to improve (*the structure*). This was apparently an effective way for the teacher to know the student's learning progress, her strengths or weaknesses; the teacher could help and encourage the students to learn and improve her learning. In addition, thanks to knowing the points that the student was not pleased with (*have not had much time for group activities*), the teacher improved and applied friendly and effective teaching methods (*more time for group activities for the student*), which helped her have a better learning environment. By writing down their thoughts and experiences, the students were able to communicate with the teacher even they did not have time to talk in class, which helped the teacher to know her students' learning. Accordingly, the teacher adjusted effective strategies and helped the students in their learning.

The Students' Attitudes towards Reflective Journal Writing

This section describes the results answering the research question about the students' attitudes towards reflective journal writing.

Table 5: Students' attitudes towards reflective journal writing

Statement	M	SD	Frequency			
			Strongly disagree	**Disagree**	**Agree**	**Strongly agree**
11. Reflective journal is easy to use.	2.78	2.78	3 (6.7%)	12 (26.7%)	22 (48.9%)	8 (17.8%)
12. I would like to share with my class what I wrote in my journal	2.31	2.31	8 (17.8%)	18 (40.0%)	16 (35.6%)	3 (6.7%)
13. I think it is helpful for my study.	2.71	2.71	5 (11.1%)	11 (24.4%)	21 (46.7%)	8 (17.8%)
14. I want to continue to write reflective journals in the future.	2.91	2.91	3 (6.7%)	11 (24.4%)	18 (40.0%)	13 (28.9%)

The items under this category got a very high rating as revealed in Table 5. This means that students had positive attitudes towards reflective journal writing. Furthermore, 48.9% of them strongly agreed and 17.8% agreed that reflective journals are easy to use. This was confirmed in the interviews, as in the following extracts:

> **I8:** *"I find that writing reflective journals is very easy. At first, when I heard about writing a reflective journal, I thought it was very difficult because I didn't think to have any idea. However, thanks to the writing sample that the teacher let us try, I have more ideas to write in my reflective journal next time."*
> **I10:** *"I think it is not difficult to write a reflective journal because I can freely write what I like or dislike; share about my English class or about my feelings and report my activities during class. Even if I make grammar mistakes or forget vocabulary, I will not afraid that my teacher will scold or give me a low mark."*

These comments indicated that the students enjoyed the experience of reflective journal writing and thus they did not consider it to be a waste of time. Also, reflective journals' writing was a good way for them to improve their learning. This is because "reflection is a meaning-making process that moves a learner from one experience into the next with a deeper understanding of its relationships with and connections to other experiences and ideas. It is the thread that makes continuity of learning possible and ensures the progress of the individual. One student shared his experiences about reflective journals:

> **I7:** *"I think it's really useful for me, I can review what I've learned before, which helps me remember the lesson more easily. Besides, if I forget some parts such as structures or vocabulary, the teacher will also know and help me review and explain them."*

Because of the important benefits that writing reflective journals brought to the students, they viewed it as a worthwhile learning experience and thus it should be continued. There are 28.9% of the students agreed and 40.0% strongly agreed with the statement "*I want to continue to write reflective journals in the future*". Nevertheless, about more than 30% of the students did not want to continue the work of writing reflective journals due to doing a large amount of homework, preparing new lessons and taking extra lessons. In addition, it was quite difficult for students to share what they wrote with their friends. Nearly 60% of the students did not want to share their journals. One participant elaborated in the following extract:

I2: *"I don't like sharing my reflective journals with others because of my private. Besides, I evaluate the work of some friends in my journal, I am afraid that they will not be satisfied if they read it."*

DISCUSSION

The findings of the study contribute to the limited literature on the advantages of reflective journal writing for primary school students. They confirmed the results of previous studies in the literature. Firstly, the first benefit of helping students improve their knowledge has been determined in several studies. In their purest form, learning journal entries reflect students' thinking processes (Hubbs & Brand, 2005) and assist them in building context, transforming their approach to learning from memorizing information to a transformed and more thoughtful and analytical approach (Pavlovich et al., 2009). Students' sense of ownership and understanding of learning, as well as the encouragements of deep rather than surface learning, have all been proposed as advantages of using learning journals. Furthermore, the research of Bisman (2011) showed that reflective journals can improve content knowledge and develop reflective skills. According to Gulwadi (2009), reflective writing "is seen as being particularly useful when students are integrating new concepts as it helps them to contextualize their learning" (p.98).

Secondly, the research results indicated that reflective journals help students understand and evaluate their own learning. This is consistent with similar findings in the literature. Anderson (2012) reported that the reflective journal acted as an instrument for the encouragement of "reflection, criticism, and self-analysis of students" (p.622). It also "becomes an opportunity to reflect on oneself and also on one's relationships with the others. Reflecting on experience becomes reflecting in the experience: in this way, the experience of the journals becomes an experience of emotional, critical and reflective relationships with the others" (Bagnato et al., 2013, p.103). Other studies showed that reflective journals can be used as an effective tool for reflection as well as an evaluation of critical reflection (Gursansky et al., 2010). For example, Gursansky et al. (2010) used an online journal to investigate students' ability to reflect on their learning process. The findings indicated that reflective journals were accepted as an "authentic learning tool with life-long applicability"(p.778). Moreover, Anderson (2012) used reflective journals to evaluate postgraduate students' reflection, critique and self-analysis through focus ethnic groups. The findings showed that reflective journals could offer a useful opportunity not only to enhance student learning but also to secure genetic advances in critical analysis and deep learning.

Thirdly, reflective journaling is a way for students to share their experiences, thoughts and feelings. This finding is in agreement with Graham's study (2003), where she found that reflective journal writing develops confidence and competence among learners. Also, reflective learning journals were meaningful learning experiences for learners. Reflective journal writing was considered as the bridge of thought, feeling, and action (Lukinsky, 1990) or the expression of sentiments concerning clinical practice, as well as the development of observational skills (Callister, 1993). Futhermore, Atkins and Murphy (1994) identified reflective journals as "awareness of uncomfortable feelings and thoughts, critical analysis of feelings and knowledge, and a new perspective (p.51)". That means students can share their feelings, whether positive or negative, about the lesson. Through reflective journal writing, students become conscious of their thoughts, positions, and feelings in connection to the learning process and the learning community (Farabaugh, 2007).

Last but not least, the research findings proved that reflective journal writing was a bridge between teachers and students. Similar findings (Dunlap, 2006) showed that reflective journals writing can provide "an opportunity for instructors to hear the voice of student teachers through the chance given to them to express the thoughts and changes they experience as a part of their learning experience "(p.24). Phelps (2005) asserted that "the journals are an important means for the collection of data in qualitative research about the students" (p.41). The data of the reflective journals, she believed, offered important observations that are not often obtained by other methods of data collection. Spalding and Wilson (2002) also maintained that reflective journal writing is important for students as it acts as a daily diary of thoughts and experiences, establishes and maintains a relationship with the facilitator and supports internal dialogue in their studies.

In addition to the findings related to the benefits of reflective journals, the research indicated that the students' attitudes towards reflective journals were positive. Most of the students found reflective journals were easy to use and they wanted to continue writing them in the future because of their benefits. This is in agreement with Park (2003) whose study showed that " most students recorded that they felt that this was a useful thing to do, valuable to them in a number of important ways" (p.195). Similarly, Williams (2008) found that most of the students in her study liked to continue using reflective journals. The findings of the research contradict those of Park (2003) who found in his study that a recurrent theme in many journal entries was the difficulty of the task and Sen (2010) who claimed reflective learning journals to be highly demanding and time-consuming. One interesting point of the findings is that not all of the students wanted to share what they wrote in their journals with the rest of the class. It corresponds with the finding by O'Connell's and Dyment (2006), indicating that their students "have repeatedly expressed their reluctance to reflect honestly and deeply if they are concerned about the trustworthiness of the reader" (p.680). Also, Epp (2008) revealed that "students might choose to keep writing superficially if they have reason to believe that the reader does not create a safe space for their deep thoughts, ideas, and reflections" (p.1386).

CONCLUSION

The current study was an attempt to investigate the benefits of using reflective journals in teaching English to primary school students and the students' attitudes towards this kind of assessment. Four main benefits were identified including helping students gain their personal knowledge, evaluate their own learning process, share their experiences and express their thoughts and feelings as well as communicate easily with their teachers. Additionally, most of the students had a positive attitude towards reflective journal writing. They found reflective journals to be easy to use and wanted to continue writing them in the future. Nevertheless, there were some students who did not like to write reflective journals because of performing time-consuming tasks, doing large amounts of homework, preparing new lessons and taking extra lessons. They also did not want to share what they wrote in the journal with their friends due to privacy.

The research findings support the use of reflective journals in English classes for primary school students. In order to encourage students to keep long-term reflective journals, teachers need to be patient and creative. They need to form their students' habit of journaling through games, put reflective journals into a formative form of assessment, wholeheartedly instruct, explain and help them in journal writing. Also, teachers should reply to what the students write in their journals and support them in overcoming their weaknesses. In addition, they need to

create a friendly and comfortable atmosphere for their students to easily express their thoughts and experiences after each lesson.

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IMPACT OF ONLINE LEARNING BASED ON CREATIVITY AND ACHIEVEMENT IN DESIGN AND INVENTION SUBJECT

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ABSTRACT

This research aimed to study students' understanding and creative thinking in Innovation Subject through online learning. This quasi-experimental quantitative study focused on students' understanding and creative thinking of the subject through online learning brainstorming technique. Samples of 36 students from School Y participated in the treatment (online learning) and every student sat for the pre-test and post-test to measure their understanding and creativity of the subject. Results from paired t-test have shown that the pre-test and post-test for aspects of student achievement in the subject of design is t = 13.858 and the level of significance is p = 0.001 and student creativity in the Invention Subject is t = 16.739 and a significant level is p = 0.001. This significance level was lower than 0.05 (P <0.05). Results showed that there are significant differences between students' achievement and creativity after applying the online learning brainstorming technique. This showed that online learning has successfully increased students understanding and creative thinking of the subject, aligned with the government's wish and education blueprint, which is to produce creative products.

Keywords: brainstorming, online, innovation subject, understanding, creativity

INTRODUCTION

Globalization has changed the education system of both developed countries and developing countries. The implication of this phenomenon has led to various ways, methods and techniques for effective student learning programmes being introduced to the world. Among the main processes in student learning development are cognitive skills, psychomotor skills and the inculcation of values (Hafiza Abas & Halimah Badioze Zaman, 2010).

In classrooms with project-based learning, each process for student development requires students to use different skillsets. For example, 80% of cognitive skills are required in developing themes, selecting appropriate project materials and resources as well as generating and refining creative ideas based on project materials (Michinov et al., 2015). Apart from that, psychomotor skills of drawing and sketching are also important in generating students' creative ideas. The existing approach of rote memorization bears many weaknesses especially in terms of thinking skills (Rainal et al., 2016). The designed learning process is more about cognitive skills and psychomotor and indirectly affects learning which has led to producing altruistic behavior and positive thinking.

Common teaching and learning strategies practiced in today's classroom are often restricted to rote memorization of textbooks. However, the traditional teaching and learning method is now out-dated. In the current pandemic situation, online teaching and increased accessibility of free existing and new resources are preferred. Rote memorization often leads to students' inability to think outside the learning box. Thus, students' learning needs to be

supported with a reasonable strategic approach that could stimulate their thinking creatively and critically (Hashim, 2015).

The existing learning and teaching of Design subjects are a method of approach that focuses on sketches and produces more products on psychomotor skills. This approach has long been used and was found to be less impactful; this is because sketches and products made by the students are stereotyped. Students lack the contribution of creative and critical ideas as well as their motivation. In addition, the knowledge of performance for this subject has also failed to improve. Students are more attuned to receiving teachers' instructions in the classroom and as for that, the achievement scores and creativity levels are also affected.

The second factor is that teachers lack motivation and confidence in their teaching as well. This is because they do not practice the teaching approach recommended by the government (Muhamad Abdillah Royo & Haleefa Mahmood, 2011). Therefore, drastic changes in the teacher-to-student teaching approach need to be implemented. Experienced teachers need to change their way of thinking and delivery during their teaching in order to implement the government's aspirations in producing balanced individuals in the era of Industrial Revolution 4.0 (IR 4.0).

To address the two challenges faced by both teachers and students in Design and Invention subject, this paper presented a proposed solution in by introducing a brainstorming approach in online learning, and investigated its effectiveness in improving secondary students' creativity levels and achievement in the subject. Two hypotheses were devised as the following:
$H_0$1: Is there a significant difference in the level of understanding among students about the online brainstorming approach in the pre- and post-test?
$H_0$2: Is there a significant difference in the level of creativity of students in the pre-test with post-test in an online brainstorming approach?

LITERATURE REVIEW

Osborn (1953) is the proponent of brainstorming techniques in groups. He explained that working and thinking individually will give fewer effective ideas and thoughts compared to discussions in the brainstorming method (Alshammari, 2015). Brainstorming is a proliferation of creative ideas that have rules and guidelines. In brainstorming, the teachers need to be proficient in using the technique in order to provide better impacts to their teaching (Emami et al., 2013).

Among the common brainstorming rules are:

- Without criticism: group members are free to give ideas, after which, the ideas will be criticized if it does not make sense and finally different and thoughtful ideas will be reviewed.
- Ideas in Thought: In this session, all members of the group will set aside all restrictions of thought. To think creatively one needs to explore and thinking of things that are logical and out of the ordinary.
- Focus on quantity: Many ideas are given so they are easy to classify.
- Combine and enhance ideas: all ideas are given either through thought that makes sense or otherwise will be evaluated and reviewed to get an idea that is relevant.

Brainstorming can be done in various situations such as classrooms, meetings and it can be done online. The online approach can involve many students learning at the same time and learning also occurs wherever students are (Qiu, 2010). Other than that, students can learn online regardless of their age and level of knowledge (Young & Cho, 2014). Even discussions

will be livelier in groups and the generation of students' creative ideas will occur indirectly (Paulus et al., 2013). In the presence of dynamic relationships between group members with the benefits of using online learning, brainstorming techniques can support the increasing number of new creative ideas created.

In addition, the advantage of flexibility information technology (ICT) is able to showcase students' ideas during discussion sessions without any delay (Michinov, 2012) and in turn, promote a competitive environment directly for creative thinking (Sophonhiranrak et al., 2015) where the throwing of ideas can be broadcast live and students can respond to peer ideas immediately, thus enhancing students' creative thinking abilities and their understanding on the concept of Design and Invention. In addition, ICT is a tool that can help students' learning by providing creative ideas which is indispensable in educating the culture of deep creative thinking in students' education (Wood & Bilsborow, 2011).

Furthermore, embedding brainstorming in online learning helps students' creative thinking in Design and Invention subject. It will also address the challenges that teachers are facing in their classroom and conform to the teaching of 21st century education. In this study, the researcher did an experiment using the online brainstorming approach for creative ideas enhancement and students' comprehension in the Design and Invention subject.

METHOD AND SAMPLING

Learning theories emphasized in this research are cognitive, effective communication and psychomotor. The cognitive learning approach takes place in the human's mind and brings to the change of knowledge, understanding, appearance, value and attitude (Bhagwatwar et al., 2013). Meanwhile, communication skills stimulate students into contributing ideas in sharing of ideas and train the students to be more polite and respectful towards each other when communicating (Faste, Rachmel, Essary, & Sheehan, 2013) and psychomotor skills is the students' ability to act when receiving the experience through previous schemata and lesson (Michinov,2012).

The research used the quantitative approach. It was a quasi-experimental research involving school Y. Thirty six students took a pre-test and a post-test. Pre-test was administered before the intervention of brainstorming in online learning was implemented. After two months, the students then underwent the post-test.

In the online teaching approach, students were required to access the necessary applications such as Telegram, Padlet, and Google Docs. Every student needed to have a Gmail account to make it easier for the facilitators to share materials in Google drive. The instruments used to test the student's creativity were the pre and post-tests. The Torrance Test of Creative Thinking (TTCT) which consists of four aspects of creativity was used. The four important measurement of creativity were originality, efficiency, flexibility and description (Runco et al., 2010). The data from this study were analyzed using Statistical Package for Social Science (SPSS) program. Achievement scores were obtained from the students' monthly tests while creativity scores were assessed via the pre and post-tests before and after the intervention of brainstorming in the practice modules. Creativity scores were obtained using the rubric derived from the Torrance Test of Creative Thinking (TTCT).

FINDINGS AND DISCUSION

In general, the findings are presented based on the two hypotheses as the following:

$H_0$1: There was no significant difference in the level of understanding among students about the online brainstorming approach in the pre- and post-test.
$H_0$2: There was no significant difference in the level of creativity of students in the pre-test with post-test in an online brainstorming approach.

Results of paired sample t-test analysis for comparison of achievement and creativity levels students in the pre-test and post-test in the online brainstorming approach are as shown in Table 1.

Table 1: Paired T-Test Comparison of the Pre-Test and Post-Test in Online Brainstorming Approach

Aspects	Test	N	Min	S.D	Dif.	Value-R	Value-T	Sig.
Achievement	Pre	36	46.44	13.799	28.667	.623	13.858	.001*
	Post	36	75.11	14.724				
Creativity	Pre	36	38.11	9.704	35.111	.281	16.739	.001*
	Post	36	73.22	11.195				

*significant $p < 0.05$

Table 1 shows the T-value for the comparison of pre-test and post-test for aspects of student achievement in the subject of Design is t = 13.858 and the level of significance is p = 0.001.

This significance level was smaller than 0.05 (p <0.05). Therefore, $H_0$1 is rejected. So, there was a significant difference in the level of understanding of students in the pre-test with the post-test in an online brainstorming approach. The mean score of the post-test (mean = 75.11) was higher than the pre-test (mean = 46.44). This proves that brainstorming teaching online can improve students' achievement in the Design and Invention Subject.

Table 1 also shows that the t-values for the comparison of pre-test and post-test for the aspect of student creativity in the Invention Subject is t = 16.739 and a significant level is p = 0.001. This significance level was smaller than 0.05 (p <0.05). Therefore, H_o2 is rejected. So, there was a significant difference in the level of creativity of students in the pre-test with the post- test.

The results showed that there are significant differences between students' achievement and creativity in applying the online technique approach. This proves that the online brainstorming technique serves to improve students' cognitive abilities, achievement and creativity in the Design and Invention subject.

Nevertheless, the findings from the study indicated that there is a gap in the post-test creativity score. However, the increase in knowledge achievements of the online brainstorming group was higher than the pre-test.

The findings of this study can be compared to previous studies; for example, Wang and Fussel (2010) stated that online learning has eased students' communication and discussion. Blended learning which consists of online learning mixed with face-to-face learning in the classroom also contributed to the process of instilling creativity (Wang & Fussell, 2010). In addition, the use of the existing free online platform to implement the online brainstorming method has also brought favourable results (Dharmawa et al., 2015).

The implementation of the Osborn's (1953) brainstorming technique also helped students to contribute ideas in group discussions. With the aid of the brainstorming technique, students have further strengthened the basic knowledge of design and invention subject as well as students' creative thinking (Eliason & Lynn, 2014). However, through the online brainstorming process, students' achievement in the Design and invention subject was better

because students had no problem communicating with facilitators or classmates as the discussions sessions took place online hence the information obtained was faster and easier (Abigail, 2016).

CONCLUSION

In a nutshell, the researcher would suggest a few models and approaches to teachers in contributing to the development of the subject of design and innovation specifically to produce more creative products and improve students' achievement. The existing traditional approach may no longer be relevant and should be improvised by following the students' learning preferences for effective teaching and learning to take place. The change should consider students' cognitive development through online learning. The researcher believes that students' cognitive skills should be stimulated specifically for the creative outcome. The online approach is suitable as proven by this research as it is indeed a limitless and on-going learning process. Students who were exposed to online learning increased their ability to produce more creative products compared to those who went through the traditional approach.

It is clear that the learning environment plays an important role in learning. It is obvious that online learning has the potential to offer not only an open system that blends access to information and purposeful communication into dynamic and intellectually challenging learning community; it also offers deep and meaningful learning. Students are able to immerse themselves productively across time and space and be enriched immensely through the content of the internet. Online learning is a useful source of idea to complement the direct injection of ideas associated with the defined content of the Innovation subject.

As for the design, students are our future generation in producing new competitive products. Therefore, they need to be equipped with skills and knowledge so that they are brave enough to voice their thoughts, throw creative ideas, understand the basics of Design and Invention. Not only that, the global online learning approach also plays a role in preparing students for an increasingly challenging world.

Overall, the researcher suggests that the existing teaching model is an irrelevant approach and needs to be modified so that it would be more effective with the changes of the present era. The brainstorming technique can be used not just for Design and Invention subject but for all subjects offered at school. Researchers believe that online students' cognitive skills are appropriately implemented at all ages of students both in primary, secondary and university levels. This is because online learning is a process of students' continuous self-learning and borderless as well. Finally, it is also able to promote high order level thinking and ensures that students can compete well with other students all around the globe.

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