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

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ABSTRACT

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

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

INTRODUCTION

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

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

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

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

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

LITERATURE REVIEW

Vygotsky - Zone Proximal Development (ZPD) and Scaffolding

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

Stephen Krashen's Input Hypothesis

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

Technological Pedagogical Content Knowledge (TPACK) Model

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

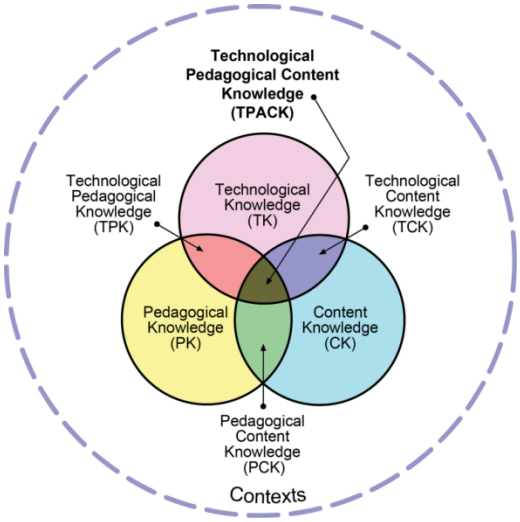

Figure 1 The Components of the TPACK framework (adapted from Mishra & Koehler, 2006).

Table 1 The Components of the TPACK framework

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

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

Game-based learning

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

Previous Research on the Impact of Quizizz Implementation

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

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

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

METHODOLOGY

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

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

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

Table 2 Reliability Test (Cronbach's Alpha)

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

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

FINDINGS & DISCUSSION

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

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

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

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

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

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

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

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

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

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

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

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

Table 6 Descriptive Statistics of the Questionnaire Result

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

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

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

Implications of the study

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

Limitations of the study

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

CONCLUSION

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

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

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

REFERENCES

Afzal, N. (2019). A Study on vocabulary-learning problems encountered by BA English majors at the university level of education. *Arab World English Journal*, 10(3), 81-98. https://doi.org/10.24093/awej/vol10no3.6

Alfehaid, A. (2019). Online English language learning activities and academic achievement: Experiences of first-year students and their teachers. *Pertanika Journal of Social Sciences and Humanities*, 27(3), 1557–1572.

Amalia, D. F. (2020). Quizizz website as an online assessment for English teaching and learning: Students' perspectives. *Journal of English Language Teaching Fakultas*, 7(1), 1-8.Available at: https://doi.org/10.33394/jo-elt.v7i1.2638.

Bakhsh, S. A. (2016). Using Games as a Tool in Teaching Vocabulary to Young Learners. *English language teaching*, 9(7), 120-128.

Basuki, Y., & Hidayati, Y. (2019). Kahoot! or Quizizz: the Students' Perspectives. In *Proceedings of the 3rd English Language and Literature International Conference* (ELLiC). https://www.researchgate.net/publication/334358438

Chirandon, A., Laohawiriyanon, C., & Rakthong, A. (2010) *The Effects of Teaching English through Games.*

Damayanti, F. I. (2021). EFL Students' Perception and Motivation toward Quizizz as E-Learning Media in English e-Classroom. *Education of English as Foreign Language Journal* (EDUCAFL). 4(2), 70-77. https://doi.org/10.21776/ub.educafl.2021.004.02.03

Darmawan, A., & Undang, G. (2020). Penggunaan aplikasi Quizizz dalam mata kuliah vocabulary building: masalah dan solusi. *Jurnal TheGIST*, 3(2), 19-33.

Fisch, M. S. (2005) *"Making educational computer games educational", In Proceedings of the 2005 conference on Interaction, design and children*, Boulder, Colorado (pp. 56–61).

Gulek, J. C., & Demirtas, H. (2005). Learning with technology: The impact of laptop use on student achievement. *The journal of technology, learning and assessment*, 3(2).

Jung, J., & Graf, S. (2008). *An Approach for Personalized Web-Based Vocabulary Learning through Word Association Games*. 2008 International Symposium on Applications and the Internet, 325-328.

Konting, M. M., Kamaruddin, N., & Man, N. A. (2009). Quality Assurance in Higher Education Institutions: Exist Survey among Universiti Putra Malaysia Graduating Students. *International Education Studies*, 2(1). https://doi.org/10.5539/ies.v2n1p25

Law, S. H., Yunus, M. M., & Hashim, H. (2021). Strategy to improve English vocabulary achievement during Covid-19 epidemic. Does Quizizz Help? *Journal of Education and e-Learning Research*, 8(2), 135-142.

Liong, Y., Kwan, P., Abdullah, A. N., Govindasamy, P., & Yunus, M. M. (2019). Learn idioms the fun and mobile way with Quizizz. *International Journal of Scientific and Technology Research*, 8(12), 1749-1752.

Masoud, H., & Ibrahim, O. L. (2017). The effectiveness of using an e-mind mapping software based program in developing faculty of education 2nd year English majors' vocabulary acquisition and use. *Journal of Research in Curriculum Instruction and Educational Technology*, 3(4), 177–224. https://doi.org/10.21608/jrciet.2017.24441

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers college record*, 108(6), 1017-1054.

Mohamad, M., Arif, F. K. M., Alias, B. S., & Yunus, M. M. (2020). Online game based formative assessment: Distant learners post graduate students' challenges towards Quizizz. *International Journal of Scientific and Technology Research*, 9(4), 994-1000.

Mohamad, S. N., Sazali, N. S., & Salleh, M. A. (2018). Gamification approach in education to increase learning engagement. *International Journal of Humanities, Arts and Social Sciences*, 4(1), 22- 31. https://doi.org/10.20469/ijhss.4.10003-1

Mustika, I., Affini, L. N., & Sophia, B., Th. C. (2022). The Use of Quizizz to facilitate students' vocabulary learning. *Dinamika Bahasa Dan Budaya*, 17(2), 42–52. https://doi.org/10.35315/bb.v17i2.9110

Permana, P., & Permatawati, I. (2020). *Using Quizizz as a formative assessment tool in German classrooms. In 3rd International Conference on Language, Literature, Culture, and Education (ICOLLITE 2019)* (pp. 155-159). Atlantis Press. https://doi.org/10.2991/assehr.k.200325.073

Plass, J. L. et. al. (2015). Foundations of Game-Based Learning. *Educational Psychologist*, 50(4), 258 - 283. https://doi.org/10.1080/00461520.2015.1122533

Shaffer, D. W., Squire, K. R., Halverson, R., & Gee, J. P. (2005). Video games and the future of learning. *Phi delta kappan*, 87(2), 105-111.

Vygotsky, L. S. (1972). The psychology of art. *Journal of Aesthetics and Art Criticism,* 30(4).