Quizizz as an Alternative Assessment Tool: A Survey

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ABSTRACT

Among the problems faced by students in higher learning institutions during the Covid-19 pandemic is the constraint to carry out real-time and face-to-face assessments. This constraint causes students to have difficulty completing the assessments within the time given. This research aims to examine the use of Quizizz, a game-based quiz application, as an alternative approach to increase students' commitment in completing the long-distance quizzes within the allotted time, as well as improving students' mastery of the topics being assessed. By using this application, instructors can conduct a real-time quiz session with their students remotely, regardless the distances. Quizizz also provides the final score along with correct answers to all questions once the quiz is completed. This Quasi-Experimental study involved 110 local and international students taking social science courses. The research data were analyzed using the T-Sample test for comparison of scores between conventional and alternative quizzes and the Simple Linear Regression test for correlation analysis between variables. Comparison of score analysis between quizzes recorded a significant difference, with a value of p = 0.000 recorded. Regression analysis, in contrast, showed a significant relationship between alternative methods and the scores produced. The results show that students are more comfortable and interested in using game-based quiz as an e-quiz approach in the new norm.

Keywords: Quizizz; Game-Based Assessment; New Normal; Formative Assessment; E-Quiz

INTRODUCTION

Online learning has become significantly popular in many educational institutions worldwide, especially after the Covid-19 epidemic. It was reported that 1.575 billion students from 188 countries were affected by the closure of their educational institutions during the epidemic (UNESCO, 2020). As such, online learning is seen as the best option to ensure that students at all primary, secondary and tertiary levels are not left behind in their studies. Current technological advancement in the era of the fourth Industrial Revolution (IR4.0) has witnessed various benefits that are offered by online learning platforms which include time and space learning flexibility (Jandric, 2020).

In fact, there are increasing numbers and various choices of online learning tools that can be utilized for teaching and learning nowadays. This is especially true in Malaysia where various online learning initiatives are introduced across all educational levels – from schools up to the higher learning institutions. Students at schools were first introduced to online educational television channel known as eduwebtv, cikgootube and Kelas@Rumah. These TV programs were created as an alternative casual learning session for students with the help of media and gadgets (Wan, 2020) on top of online class sessions with their school teachers.

At tertiary levels, most universities or colleges have created their own Learning Management System (LMS) to manage online learning at their respective institutions more systematically (Houlden & Veletsianos, 2020), either through Moodle or other LMS applications such as Edmodo, Google Classroom, ClassDojo and many more. Along with these developments of online teaching and learning, student assessment has also gone through transformation using online platforms such as E-Assessment.

PROBLEM STATEMENT

It is important to note that there are several measures that need to be addressed properly during the transformation from conventional assessment to online assessment or E-Assessment in order to ensure its effectiveness. First, online assessment should overcome the constraints of conventional assessment. For example, due to space factors, face-to-face approaches as carried out in a conventional assessment are no longer practical (Chikezie & Okoye, 2023). E-Assessment is an alternative option to replace the approach. This form of e-assessment has existed since early 2000s (Wahas & Syed, 2024). Given the frequent physical encounters in the classroom at that time, the online platform was used only for certain types of assessment. Currently, all forms of assessment are conducted remotely. In this case, the risk to the students' academic integrity when sitting for assessment is something that needs to be taken into consideration seriously (Sabrina et. al., 2022).

Second, the existing assessment format requires manual marking. The conventional assessment method is done through the traditional grading process by the teachers. Such an approach is burdensome to teachers as they must spend an extensive amount of time and energy to carry out manual marking and grading. In some circumstances, the conventional assessment also brings about the risks of mistakes and negligence by the teachers. At this point, the reliability of this grading process is questionable (Meylani, 2024). Another drawback of the conventional method is that it does not provide immediate feedback to students on their mistakes as well as recommendations for improvement based on the errors made in the tests (Chikezie & Okoye, 2023). This makes the students feel that they do not benefit much from the conventional assessment.

Third, the existing forms of assessment feature a limited variety of ideas. Most existing assessment methods use common formats such as oral forms, written tests and group assignment, which are considered as outdated and dull. It depends on the creativity of individual teachers to make full use of available facilities and alternative strategies to make learning and assessment sessions more enjoyable (Jinghang, 2024).

The issues presented above indicate the need to create an e-assessment approach that can be operated in real-time which is able to perform an automatic grading as well as incorporating interesting and entertaining features that are impactful on students. For the purpose of the research presented in this paper, a game-based quiz application, known as Quizizz, was chosen as the assessment tool. The application of this latest technology through the concept of game-based quiz added value to the teaching and learning process by enhancing students' involvement in the assessment process.

Research Objective

This research aimed to examine students' scores in the Quizizz application, an alternative tool of e-assessment, by comparing two groups of students in a control group and a treatment group. The research was guided by the following research questions:

What are the differences of students' score in the Quizizz application between the control group and treatment group?

LITERATURE REVIEW

Increasingly online learning sessions make e-assessment as the main choice in assessing students. E-Assessment alternative medium through the proposed intervention is an online quiz application that implements the concept of game-based quiz. The three concepts used in this research, namely e-assessment, quiz and game-based quiz app are briefly explained in this section.

E-Assessment

E-Assessment involves a combination of assessment and the latest technology. E-Assessment is available in various forms such as paper-based digitalization systems and online assessments (Khan & Khan, 2019) as well as IT-assisted assessment systems, applications or computer programs (Okan Sarigoz, 2023). The stages

in the e-assessment involve the complete design of the assessment system and process (Abubakar & Adeshola, 2019). Among the common forms of e-assessment are e-quizzes in the form of multiple-choice questions, e-portfolios, live marking of assignments on screen as well as electronic prototype development projects by students (Ayaz & Gulen, 2022). Students are more inclined to e-assessment which gives them more control over the way, method and time of assessment is done, in addition to its student-friendly and game-oriented appearance and characteristics (Khan & Khan, 2019). It is also fast and easy to operate. E-Assessment provides immediate feedback for the smooth learning process as opposed to conventional form assessment (Rolim & Isaias, 2018), which helps in improving student performance and level of learning.

Quiz

Quiz is one of the popular forms of formative assessment. Quiz are often chosen as a classroom assessment due to their easy-to-manage, student-friendly form, as well as being able to help students familiarize themselves with online assessment methods (Okan Sarigoz, 2023). This form of formative assessment also enhances student engagement and learning potential. In conducting online quizzes, the multiple attempt for students to answer gave them space to improve their knowledge and learn from mistakes (Norizan, 2024).

Games-Based Quiz & Quizizz App

In the existing learning process, a game-based approach is applied through game elements as activities and assessments, replacing traditional classroom activities as well as conventional assessment (Sawang et. al., 2017). Compared to conventional medium, this medium is more effective in increasing student motivation through integration between technologies (application usage), fun game concepts as well as broader knowledge exploration (Dean, 2017), while increasing students' enthusiasm and interest while studying and taking tests (Gomez at. al., 2022).

Quizizz is one of the mediums of game-based quiz applications that applies the concept of gamification (MacNamara & Murphy, 2017). Quizizz integrates information technology, knowledge and fun game concepts to engage students and users. After students answer each question, Quizizz will display a picture along with memes to state whether the answer is correct or incorrect. This is a form of fun and attraction to students (Miller, 2017). The feedback on monitoring and assessment toward students also shows high students' engagement when Quizizz is used (Boulden et al, 2017).

METHODOLOGY

This research employed a quantitative approach by focusing on the two-groups posttest design under Quasi-Experimental. This design provided an opportunity for the researchers to see the final effects comparatively of the two e-assessment mediums.

Participants

The selection of participants was done through purposive sampling. A total of 110 undergraduate students from various fields of study were selected to participate in this research. The students were picked from a class of an elective course. The total number of students were then divided into 55 each in the control and treatment group respectively. The division of students into control groups and treatment groups was done randomly to ensure there was no weighting or bias in any group.

Research Procedure

The research started with an online teaching session that was conducted via Google Meet. The sessions were conducted separately to both groups for 4 weeks. The teaching materials, teaching methods and approach provided were the same for both groups. Next, the students in the treatment group were briefed on the methods and procedures for answering the quiz through the Quizizz app. Students in the control group already had an existing knowledge of the use of learning management system (LMS) to complete e-assessment.

The e-assessment session, which was a quiz, was conducted simultaneously between the two groups through the medium. Once students completed the quiz, the quiz completion time was recorded through features on the medium. Finally, questionnaires were distributed to the students to find out their feedback on the effectiveness of conventional and alternative e-assessments mediums.

E-Assessment Medium

In this research, two e-assessment mediums were adopted, namely conventional e-assessment medium and alternative e-assessment medium.

Conventional Medium

Conventional e-assessment used the medium of learning management system (LMS) as an intermediary, where students needed to download a question file in Microsoft Word format and answered the questions in the file. Students were given 1 hour and 30 minutes to complete 30 questions in the quiz. The file was sent via the submission link available in the LMS. The time taken by students to complete the quiz could be checked through the assignment submission link.

Intervention Medium

Game-based quiz app Quizizz was the medium for an alternative e-assessment. This method required the instructors to have a Quizizz account. The instructors would share their passwords to enable the students to access the quizzes via https://quizizz.com/join. Students could answer the question anywhere through their electronic devices. Compared to other game-based quiz applications such as Kahoot, the Quizizz feature allowed the students to view questions on the screen of their devices and answered questions according to a given time. On the part of the instructor, the screen displayed a scoreboard that provided information on the quiz participants, the number of questions that had been answered, the number of correct or incorrect questions and who had completed answering or was in the process of answering. Students were given 1 hour and 30 minutes to answer 30 questions, with a specialization of 3 minutes for each question. This quiz session was over when all students have finished answering.

This Quizizz app also allowed modifications to the question position. In this case, if any of the students did not participate in the quiz in the first session, the instructor could use this function to change the position of the question so that the confidentiality of the quiz could be maintained. At the end of the quiz, students would get immediate feedback such as the number of marks as well as the correct answers to the incorrectly answered questions.

Research Instruments

Two instruments were used in this research - the questionnaire and a set of quiz.

Questionnaire

The questionnaire for this research consisted of two parts, namely A) Student Demographic section and B) Online Tools as E-Assessment Medium. Part B of this questionnaire contained 10 items. A 5-point Likert scale was used in this questionnaire. For validity, content and face validity was done through expert reference to ensure that the statements in the questionnaire were fair for both mediums. A pilot study involving 15 students for each group was conducted for the purpose of instrument reliability testing.

Quiz Set

This research used the same quiz set for both groups, the control and treatment groups. This set of questions was taken from the actual course assessment questions and adapted according to the features available on the mediums. The questions set had 30 multiple choice questions (MCQ) with a total of 30 marks. This question underwent a process of validity and standard reliability at the departmental and institutional level.

Data Collection and Analysis

Data collection was carried out during and after the treatment session ended. Test score data was taken from the student' question file (for the control group) and the final score data in the Quizizz app (for the treatment group). Data for quiz completion time was obtained through the quiz submission link on the LMS application and the scoreboard on the Quizizz application. Questionnaires were distributed to participants after the quiz session ended.

All data were processed through Independent T-Test for comparison between questionnaire findings, quiz completion time and quiz scores between control and treatment groups. The process of data analysis was done by comparing the mean and standard deviation through descriptive analysis.

FINDINGS

This section presents and discusses the findings of the study which looks at the differences of students' score in the Quizizz application, an alternative tool of e-assessment.

The differences of students' score in the questionnaire between the control group and the treatment group.

An independent T-Test analysis was performed on the findings from the questionnaire to determine the difference of questionnaire score between control and treatment group based on the following research question and hypothesis:

Table 1 :- Independent T-Test: Group Statistics

Group Statistics					
	Research Group	N	Mean	Std. Deviation	Std. Error Mean
S1 - The procedure for quizzes completion through this medium is very easy to understand.	Control	55	4.18	.389	.067
	Treatment	55	4.62	.490	.066
S2 - Through this medium, quizzes can be answered anywhere	Control	55	4.20	.404	.054
	Treatment	55	4.49	.505	.068
S3 - Through this medium, quizzes can be achieved at any time.	Control	55	4.18	.389	.052
	Treatment	55	4.60	.494	.067
S4 - Through this medium, quizzes can be answered through any electronic device	Control	55	3.07	.604	.081
	Treatment	55	4.80	.404	.054
S5 - Through this medium, the quiz can be answered directly without having to install any application	Control	55	4.00	.000	.000
	Treatment	55	4.60	.494	.067
S6 - This medium does not require a lot of internet data usage	Control	55	4.24	.429	.058
	Treatment	55	4.07	.573	.077
S7 - This medium is very interesting to use	Control	55	3.07	.604	.081
	Treatment	55	4.55	.503	.068
S8 - This medium has interesting special features.	Control	55	3.25	.440	.059
	Treatment	55	4.55	.503	.068
S9 - The procedure for submitting quiz answers through this medium is quick and easy.	Control	55	3.65	.480	.065
	Treatment	55	5.00	.000	.000
S10 - Overall, this medium is very effective as an e-assessment app during the new norms education.	Control	55	3.18	.389	.052
	Treatment	55	4.60	.494	.067

Table I shows a comparison of mean scores between the control group and the treatment group for the 10 items of the questionnaire. These items accentuate on the accessibility of e-assessment through the medium, the practicality of using the medium as well as the attractive features of the medium. As shown in the table, the differences in the mean score between the two groups are observed in items S4, S7, S8, S9 and S10, where the control group recorded a score value at neutral level (value between 3.00 - 3.99) while the treatment group recorded a score value at agree and strongly agree level (4.00 - 5.00). The probable cause for the difference in item S4 is due to e-assessment via Quizizz can be accessed on any device with internet access, while e-assessment through existing medium uses the conventional method of downloading / uploading files and answers by typing. This method cannot be applied through some forms of smartphones causing difficulties in downloading the word file to the medium via smartphones.

The differences that exist between items S7 and S8 are likely due to the interesting and entertaining media features on Quizizz, while the existing medium are not equipped with such features. Similar to item S4, item S9 can also be associated with practicality when answering quizzes and submitting answers. Quizizz only needs a few clicks while the existing medium is more time consuming. The mean score of the treatment group showed a lower value for item S6, which was 4.07 compared to the mean score of the control group which was 4.24. This is likely because Quizizz relies entirely on internet access to answer the questions completely, whereas the existing medium only requires internet access during the questions downloading and answers submitting process. Students can answer the quiz offline without using any internet data. However, the use of appropriate internet data resulted in a mean score for Quizizz still at the agree level.

It is interesting to highlight that there was no significant difference in the questionnaire score between the control group and the treatment group.

Table 2 (A) :-Independent T-Test: Group Statistics

Table II (a): Independent T-Test: Group Statistics					
	Research Group	N	Mean	Standard Deviation	Standard Error Mean
Questionnaire Mean	Control	10	3.64	.484	.153
	treatment	10	4.59	.235	.074

As seen in Table II (a), the mean value for control group's questionnaire score is 3.64 while the mean value of treatment group's is 4.59. This shows that the mean value of treatment group exceeds the control group. The standard deviation of control questionnaire score is .484 while the treatment group is .235, with the distribution of data for the treatment group scores smaller than the control group scores. The number of questionnaire items (N) is 10.

Table 2 (B) :- Independent T-Test: Independent Samples Test

			Quiz Time	
Levene's Test for Equality of Variances			Equal variances not assumed	Equal variances assumed
	F			9.358
	Sig			.007
t-test for Equality of Means	T		-5.556	-5.556
	df		13.013	18
	Sig (2-tailed)		.000	.000
	Mean difference		-.946	-.946
	Std. Error difference		2.870	2.870
	95% confidence interval	Lower	23.162	23.197
		Upper	34.610	34.575

Significant (2-Tailed) values recorded in the table are 0.000, which is less than the significance level of .05. Therefore, it can be concluded that there is a statistically significant difference between the means of questionnaire score for control and treatment group. Since the table shows that the mean value for treatment group score exceeds the control group, it can be concluded that the intervention medium using Quizizz gives more positive impact to students in terms of quiz access, quiz handling and more interesting application features.

The differences of students' scores in the quiz between the control group and the treatment group.

Independent T-Test analysis was also performed on the quiz score to establish the difference of the score between both groups based on the following hypothesis:

Table III (a) illustrates that there was no significant difference in the quiz score between the control group and the treatment group

Table 3 (A) :- Independent T-Test: Group Statistics

	Research Group	N	Mean	Standard Deviation	Standard Error Mean
Quiz Score	Control	55	26.04	2.441	.330
	treatment	55	26.15	2.321	.313

It is evidenced that the mean value for control group's quiz score is 26.04 while the mean value of treatment group's is 26.15. This shows that the mean value of both groups is equal. The standard deviation of control group score is 2.441 while the treatment group is 2.321, with the distribution of data for both group scores are similar. The number of participants (N) is 55 per group.

Table 3 (B) :- Independent T-Test: Independent Samples Test

			Quiz Time	
Levene's Test for Equality of Variances			Equal variances not assumed	Equal variances assumed
	F			.141
	Sig			.708
t-test for Equality of Means	t		-.320	-.320
	df		107.721	108
	Sig (2-tailed)		.749	.749
	Mean difference		-.145	-.145
	Std. Error difference		.454	.454
	95% confidence interval	Lower	-1.046	-1.046
		Upper	.755	.755

Significant (2-Tailed) values recorded in the table are .749, which is more than the significance level of .05. Therefore, it can be concluded that there is no significant difference between the mean of quiz score for control and treatment group. Since the table shows that the mean value for both groups are the same, it can be concluded that the intervention medium using Quizizz does not have a significant effect on the marks obtained by students in the assessment.

Analysis of the Impact of Quizziz Application on Students' Quiz Scores

Based on the questionnaire, results from a simple linear regression analysis that was conducted to observe the relationship between the methods of intervention and recorded quiz scores were based on the following hypothesis:

It is discovered that there is no significant relationship between the usage of Quizizz as a medium for remote assessment and the quiz scores recorded by students.

Results from SSPS on the linear regression test correlates the significant relationship between the usage of Quizizz and the recorded quiz scores among students by F (1, 55) = 21.760, $p<0.05$, with values of R_2 = .535. Expected percentage in recorded quiz scores by students are Y =2.831 + 0.915 X when X is measured in percentages. The quiz scores of students increased by 0.915 for every percentage in usage of the Quizziz app. Significant values at Table IV is 0.000, which is lower than levels of 0.05. Therefore, these findings reject the hypothesis of significant relationship between the usage of Quizziz and the recorded quiz scores of students.

Table 4(A) :- Summary Model Quizizz Effect Towards Student's Quiz Score

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.763[a]	.535	.505	.483
a. Predictor: Quizizz				

Table 4 (B) :- Simple Linear Regression Analysis –Quizizz Effect Towards Student's Quiz Score

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3.966	1	3.966	21.760	.000[b]
	Residual	4.982	53	.249		
	Total	7.838	54			

Table 4 (c) :- coefficients model quizizz effect towards student's quiz score

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig
(constant)	2.831	.735		4.085	.048
Quizizz	.915	.327	.752	6.393	.000
Dependent Variable: Quiz score					

DISCUSSION

Clearly, the findings of the research reveal that there is a difference between control and treatment group's questionnaire score and quiz completion time. The probable cause of difference is due to the the special features of Quizizz which is real-time based, no file download/upload requirement, a compelling media feature such as animation, sound and memes as well as ease of use. The special features of this application provide students with a more enjoyable experience while sitting at the quiz remotely. Compared to assessments handling through other mediums such as email or learning management system (LMS) which requires a computer and certain file formats, the Quizizz application only needs a smartphone and a few clicks.

The real-time features by Quizizz are also a contributing factor to the difference of quiz completion time between the control and treatment groups. Conducting assessments through LMS or any remote electronic system involves several problems such as i) time consuming uploading or downloading files, ii) probability for students to take a long time to answer the quiz due to integrity factor and, iii) no control against whatever students do while answering the quiz. This real-time concept on Quizizz helps instructors to monitor student pace while answering quizzes. Students are allocated a certain amount of time for each question in the quiz. All students answer the quiz at the same time and complete the whole quiz in the same time space. This can help in reducing integrity-related issues while answering quizzes remotely. The features also allow students

to answer the quiz through a click, with no file download or upload. This allows students to maximize the use of time just to answer the question.

The noteworthy and compelling features of Quizizz can make it easier for students to answer the quiz comfortably. However, this does not have any impact on the quiz score produced at the end. There is no difference of quiz scores either for the control or treatment group. The quiz procedure in this research allocates the same time for students in both groups which is 1 hour and a half. In this context, students from both research groups had the same space and opportunity to think before answering each question. The course topics, teaching materials and teaching approaches during the 4-week online class sessions received by students of both groups are also the same. These are the elements to the quiz score obtained.

The use of the proposed intervention e-assessment medium makes the assessment process more fun and meaningful for the students. This illustrates that Quizizz app permeates total and active involvement among the students. Quizizz app not only offers a form of alternative method for the existing dull and unexciting e-assessment medium, it also has the potential to equip instructors with:

1. automatic marking,
2. the correct answers at the end of the quiz,
3. the percentage for correctly answered questions and incorrectly answered questions,
4. the time taken by students to answer each question, and
5. the features of question modifying if the quiz needs to be run repeatedly.

This well-thought-out and innovative method can be applied in all area of course, whether social science, pure science, language, engineering, economics or others. The use of Quizizz app as an assessment tool makes the process fun and attractive to students (Miller, 2017) which can stimulate and increase students' learning motivation through a combination of technology and knowledge (Deterding et. Al, 2011).

CONCLUSIONS

The proposed intervention that exploits and manipulates the usage of Quizizz app in new normal education has benefited the students in terms of accessing distance assessment comfortably, undergo assessment pleasantly and enjoyably, and equipping themselves with digital learning literacy. The Quizizz app can facilitate the transition and transcend both teachers and students to the sophisticated and demanding 21st century learning environment. An assessment process that is innovatively integrated with the 21st-century digital style enables students to engage with more enjoyable and exciting assessment sessions. The use of Quizizz app as a medium of e-assessment is not only teachers and students-friendly, but also, it is better than the less-entertaining and exciting conventional e-assessment method.

Based on the above-mentioned findings, it is imperative that every institution of education and school be equipped with internet facilities and knowledge on the use of the latest applications. This is to ensure that instructors and educational institutions are provided with more sophisticated, up-to-date and fun e-learning and e-assessment tools. As a recommendation for future studies, further studies can be done to see the possible relationship or correlation between variables like quiz completion time and quiz score.

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