



Quizizz and Hard work Character in Geometry Online Lecture: How It Influence?

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ARTICLE INFO

Article history:

Received 18 December 2020

Received in revised

Form 06 January 2021

Accepted 1 February 2021

Available online 09

February 2021

Keywords:

Quizizz, Hardwork character, Geometry

ABSTRACT

The Quizizz online quiz application and the application of hard work characters have an impact on student achievement, especially on geometry courses. This study aims to investigate the influence the Quizizz online quiz and the character of student hard work on student achievement in online geometry lectures. This study involved all semester 2 and 4 students majoring in mathematics education as a research sample. The instrument used was in the form of a quizizz online quiz learning questionnaire and hard work characters. The proper questionnaire is used as an instrument for collecting data through online media. The questionnaire scale used the Likert scale with the criteria of strongly agree, agree, half agree, disagree, strongly disagree. This research is a quantitative research with ex post facto research design. Student achievement data is obtained from the average cognitive value of students during their online lectures with quizizz. Initial data analysis uses normality test, classic assumption test and influence test. The results showed that the influence of quizizz on student achievement by 69%, the effect of hard work character on learning

achievement by 46%, and simultaneously quizizz online quiz and hard work character can influence student learning achievement by 68%. The contribution of this study is that the application of online quiz Quizizz and the character of hard work in online learning, especially geometry, has a dominant influence on student achievement so lecturers can apply to improve the students' achievement.

1. Introduction

Entering the industrial era 4.0, it is possible for the world of education, especially universities, to be able to adapt to technological developments (Faridi, 2009). The development of ICT (*Information and Communication Technology*) accompanied by its use has been carried out in various fields, especially in the field of education exception in mathematics education. Higher education provides an important role in the progress of a nation, therefore planting awareness and forming a conducive learning climate is needed in order to improve the competitiveness and quality of students. Indeks Prestasi Kumulatif (IPK) is still a measure of student success in absorbing lectures in the form of theory and practice. Students can be said to be the highest teaching objects in the formal education environment and achievements in lectures are still a trend to look for opportunities in the world of work, including educational students, especially mathematics education. One of the essential courses in the mathematics education department is the geometry course. Geometry as a basis that plays a role in supporting the mastery of algebraic concepts, numbers, arithmetic and other mathematical concepts (Huang & Cai, 2011). In accordance with curriculum guidelines based on Kerangka Kurikulum Nasional Indonesia (KKNI) geometry courses are classified into geometry I, geometry II, analytic geometry of fields and spaces and transformation geometry. In various levels of education, learning geometry is often found in school curricula (Suryadinata & Linuhung, 2018; Pagiling, 2019). The rest of the geometry is closely related to everyday life so that the application of concepts is really needed (Imawan, 2015). As prospective teachers, students of mathematics education should have provisions for teaching in formal schools. Student achievement evaluation is obtained from cumulative values in the form of formative exams, assignments and quizzes given by lecturers. Exams and assignments can be in the form of face-to-face or online.

Applying mathematics into learning is based on the ability to identify problems, variables, relationships, or assumptions that are relevant in real problems which are then transferred into mathematics (Cahyono et al., 2020). Mathematical learning that is relevant in everyday problems needs to be applied to classroom and online learning. Online learning strategies in the current pandemic era are

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needed. Online learning must be planned and designed well and effectively (Belawati, 2019). Some of the factors that influence success in online learning, especially in developing countries include technology, characteristics of teachers and students, environment *e-learning*, quality of institutions and services, infrastructure and system quality, quality of courses and information and motivation (Chaiyo & Nokham, 2017). A series of online learning requires a platform for delivering material and evaluating. Utilization of online evaluation media can use *e-learning* computer-based even android (Purba, 2019). Online evaluation can improve the ability to formulate learning needs, choose meaningful learning activities, and complete learning tasks (Setemen, 2010).

One online quiz platform that can be used as an evaluation media is quizizz which has features that are easily accessed using Android, iOS, web browsers, and Chrome Apps (Amaliyah, 2019). In practice, learning using online quizzes found significant differences between concentration, involvement, excitement, motivation and satisfaction (Chaiyo & Nokham, 2017). One of the quiz media that can be applied when learning online is Quizizz. The use of quizizz provides effectiveness in fostering development and enthusiasm in learning. The results of learning in the classroom using Quizizz showed improvement compared to the class with conventional learning (Albeta, Nofianti, & Rahmandani, 2020). Quizizz is able to provide significant improvements to the learning process skills for students (Setiawan, Wigati, & Sulistyarningsih, 2019). Efforts to improve student achievement do not only depend on learning media but also other factors, one of which is the character of each student. Is not inherited but character must be built and developed day by day consciously and through a process that is not instant (Gunawan, 2012). The importance of character in life that its role in the world of education not only shows moral actions but also loves and is willing to take moral actions (Sudrajat, 2011). Learning in the current era does not only focus on cognitive learning outcomes but also affective and psychomotor. The integration of character education in hard work and cooperation was able to make a positive contribution to student learning achievement (Ikhwanuddin, 2012). The formation of character of hard work by (Wulandari & Sukestiyarno, 2013) and (Mayasari, Natsir, & Munfarikhatin, 2019) through several stages, namely knowledge, implementation and habituation.

Some of the studies that underlie this research include research by (Munfarikhatin, Mayasari, Natsir, & Yurfiah, 2019) entitled Analysis of hard work characters and students of PISA mathematics literature. This study analyzed the character of students' hard work in solving math problems, especially geometry on PISA-oriented questions. Based on the results of direct observation and analysis of the results of student work at the top, middle and medium level, it was found that the character of hard work on students in the upper and middle groups tended to be high and students in the lower group tended to be low. From this study it can be concluded that students' hard work has an impact on learning achievement in mathematics learning. A research by (Asfar & Asfar, 2020) entitled Case based games learning strategies to improve conceptual understanding in mathematics shows that the use of online Quizizz games is more effective than CBL games. By applying Quizizz, evaluation of student work results becomes faster, more precise and accurate. The Quizizz online quiz application can also improve students' understanding skills in learning mathematics. The use of digital devices in the form of the Quizizz application can further improve the learning process because it is able to motivate students with interesting, easy and accurate features in making assessments (Junior, 2020).

The importance of applying online assessments in the form of quizzes and character education in online learning, this study aims to (a) describe student responses to online lectures using quizizz, hard work characters and student achievement (b) determine the effect of online quizizz quizzes on student learning achievement, (c) the effect of hard work characters on student learning achievement, and (d) quizizz and hard work characters on student achievement.

2. Methods

This research was conducted in geometry online lecture even semester in the mathematics education department. To measure how much influence the quizizz has on student achievement, the influence of hard work character on student achievement, and quizizz and character of hard work on student achievement. The method I use is quantitative with research types *ex post facto*. (Natsir, 2019) states the study aims to examine the causal relationship without manipulation and treatment by researchers (Sappaile & Makassar, 2020; Simon, Marilyn K., 2013). The sampling technique in this study is using saturated sampling or all members of the population are used as samples (Sugiyono, 2010). The subjects of this study were all mathematics students in semester 4 and semester 6 who took part in geometry lectures at the Musamus University Mathematics Department. Data obtained using quizizz questionnaires and hard work characters that have been tested for validity and reliability through a questionnaire trial on the trial group. Data collection using a Likert scale (Budiaji, 2013). Questionnaire

consisting of five answer choices namely strongly agree, agree, somewhat agree, disagree and strongly disagree. After obtaining a valid and reliable questionnaire, the questionnaire was then distributed online using the media *Google form*.

Data were analyzed using SPSS for initial analysis and hypothesis testing. There are three variables in this study, namely quizizz (X_1), hard work character (X_2) and student learning achievement (Y). Data taken by the questionnaire method is quizizz data and hard work characters analyzed using quantitative analysis. while learning achievement data is taken based on the average student learning achievement during online lectures using quizizz. The data is then processed to find out the mean, median, standard deviation.

The analysis used in this research is multiple linear analysis, therefore we need test requirements including residual normality test to find out whether there are confounding variables in the regression model. Test classic assumptions is multicollinearity tests to prove whether there is a linear relationship between independent variables that will affect the dependent variable by looking at *VIF* and *Tolerance* values in SPSS output. Heterocedastisity testing aims to test whether in the regression model there is a difference in residual variance between one observer and the other. For testing carried out using the Glesjer test. The autocorrelation test is intended to determine whether in the linear regression model there is a high correlation between one error with another error. To see the existence of autocorrelation with the Durbin Watson test with the provisions if $-2 \leq DW \leq 2$ there is no autocorrelation (Sukestiyarno, 2013). Normality test aims to test whether the variables tested were normally distributed. This can be done with hitogram chart analysis and QQ plots. Hypothesis testing is done using multiple regression models with independent variables online lectures using quizizz and hard work characters, the dependent variable is student achievement. The questionnaire data was then analyzed using the multiple regression analysis model and seen how much influence between variables based on the large R square value. Further analysis is carried out after passing the normality test and the classical assumption test is fulfilled

3. Result and Discussion

Results

The results of this study are in the form of quantitative data which includes testing the validity and reliability of the questionnaire instrument used as research, classical assumption tests, and hypothesis testing to answer research questions.

Instruments Validity and Reliability

The validity used in this study is the construct validity using product moment correlation. Based on the validity test of the quizizz instrument, 14 items of valid questionnaire were obtained from the 30 items tested. The questionnaire was developed into four dimensions, namely the dimensions of appearance, ease, attractiveness and usefulness. Table 1 shows the questionnaire results of the validation tests used as instruments. The construct validity test can be seen from the validity coefficient values. From the results of the validity test using SPSS valid items can be determined and not by comparing with the coefficient of validity.

Table 1 Result of Hard Work Character Validity

Questionnaire Items	Criteria
1, 2, 3, 4, 5, 7, 8, 11, 12, 14, 15, 16, 17, 19, 20, 22, 23, 24, 25, 26, 29	Valid
6, 9, 10, 13, 18, 21, 27, 28, 30	Invalid

Table 2 is the result of the questionnaire validation of the character of student hard work.

Table 2. Result of Validity Test of Quizizz

Questionnaire Items	Criteria
4, 5, 6, 7, 11, 12, 16, 19, 20, 22, 23, 24, 26, 28, 29	Valid
1, 2, 3, 8, 9, 10, 13, 14, 15, 17, 18, 21, 25, 27, 30	Invalid

From the results of the hard work character validation questionnaire, 17 valid questionnaire items from 32 questionnaires were tested. Based on the validity test of the quizizz instrument, 14 items of

valid questionnaire were obtained from the 30 items tested. The questionnaire was developed into four dimensions, namely the dimensions of appearance, ease, attractiveness and usefulness.

The reliability test is used to find out whether the questionnaire used is really able to measure students' responses to quizizz and the character of hard work. Test reliability is measured to get a test instrument that has the consistency of research results. The reliability coefficient seen from the value *Cronbach Alpha* on SPSS with the instrument criteria will be reliable if the value of the reliability coefficient > 0.6 . The reliability coefficient of the quizizz questionnaire is 0.604 and the character of hard work is 0.787.

Variable Description

Exposure to the variable lectures using quizizz, the character of hard work and student learning achievement is shown in Table 3.

Table 3. Statistical data of all research variables

Variable	Mean	Median	Std. Deviation	Variance
X ₁	66,78	67,50	10,788	116,379
X ₂	69,86	69,00	7,440	55,347
Y	69,26	69,50	13,557	183,788

Assumption Test Results

Normality Test

Student achievement scores are taken from the average value of lectures by applying an online quizizz quiz. Normality test with normality test shows the quizizz variable (X₁), the character of hard work (X₂), and student achievement (Y) are normally distributed with the quizizz coefficient by looking at the sig value $0.2 > 0.05$ means that the quizizz questionnaire data is normally distributed. Sig value hard work character $0.2 > 0.05$ and sig. student learning achievement of $0.2 > 0.5$ so that they can be said both are normally distributed.

Multicollinearity, Autocorrelation, and Heterocedasticity

The classic assumption tests used include multicollinearity, autocorrelation and heterocedasticity tests. Multicollinearity aims to test whether the regression model found a high correlation between independent variables (Sukestiyarno, 2013) (quizizz and character of hard work). Multicollinearity does not occur if the coefficient value in the tolerance column > 0.1 and VIP value < 10 . In the calculation results obtained *Colinearity statistics* in the tolerance column on the quizizz variable is $0.378 > 0.1$ and on the hard work character variable $0.378 > 0.1$. To strengthen interpretation, it can be seen in the VIP column on the quizizz variable of $2,645 < 10$ and in the hard work character variable $2,645 < 10$. It can be concluded that the two independent variables do not occur multicollinearity or do not touch between the variables. An autocorrelation check can be seen in the Durbin-Watson column. In the output results obtained values of 1.9. And the ideal value to show there is no autocorrelation is $-2 < D < 2$. So that the interval does not occur in autocorrelation. This means that the assumption of each observation measurement from one observation to the next is to have homogeneous variance requirements. Furthermore, checking for heteroscedasticity using the Glesjer test on the coefficient value seen sig value. the quizizz variable is $0.137 > 0.05$ and the hard work character variable is obtained sig. $0.725 > 0.05$ so that it can be stated that there are no symptoms of heterokedasticity between the independent variables.

Hypothesis Test

Hypothesis testing includes testing the effect of quizizz variables on learning achievement variables, the effect of hard work character variables on learning achievement variables and the effect of quizizz variables together with hard work character variables on student achievement variables.

The effect of quizizz on learning achievement

$$Y' = a + bX$$

$$Y' = -0,943 + 1,051X$$

Table 4. Regression Value Test Output X1 Towards Y

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.943	6.721		-.140	.889
	X1	1.051	.099	.837	10.578	.000

Table 5. Influence Test Output X1 Towards Y

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.838 ^a	.702	.689	7.561

To find out the influence of quizizz on student learning achievement can be seen through the Adjusted R square column of 69%. This means that the influence of quizizz on learning achievement is high.

The effect Hardworking Character on Learning Achievement

$$Y' = a + bX$$

$$Y' = -18,085 + 13,441X$$

Table 6. Regression Value Test Output X2 Towards Y

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-18.085	13.441		-1.346	.185
	X2	1.250	.191	.686	6.534	.000

Table 7. Influence Test Output X2 Towards Y

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.686 ^a	.471	.460	9.945

While the effect of the character of hard work on student achievement by 46% can be said the character of hard work does not have a dominant effect on student achievement.

The effect Hardworking Character on Learning Achievement

$$Y' = a + b_1X_1 + b_2X_2$$

$$Y' = -5,209 + 0,127X_1 + 0,982X_2$$

Table 8. Regression Value Test Output X1, X2 Towards Y

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-5.209	10.420		-.500	.620
	X2	.127	.236	.070	.539	.593
	X1	.982	.163	.781	6.031	.000

Table 9. Influence Test Output X1, X2 Towards Y

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.837 ^a	.700	.694	7.505

The influence of quizizz and the character of hard work simultaneously towards student learning achievement by 69%. These results indicate that quizizz and hard work character have a dominant influence on student learning achievement in geometry lectures. Based on the research results, the use of quizizz media has a great influence on student achievement, namely 69% during online lectures. This is because the quizizz visualization is interesting and communicative, and it is easy to use and students can see the results of their answers transparently.

Discussion

The influence of online quiz Quizizz and character education, especially hard work, needs to be known considering that online learning has now become a necessity for students. Quizizz has been widely used as a companion assessment feature in the form of quizzes that aim to encourage students to learn online. Online learning platforms are dominant in delivering material and submitting assignments but not many have provided online quiz features that already have templates and are practical and fast to use. The hard work of students in online learning on learning achievement in geometry courses also has a dominant influence. This is because students have to really understand the material presented and try to study on their own and find other sources to be able to do the assigned assignments.

Based on the results of hypothesis testing, it can be stated that the online quizizz has a dominant effect, namely 69% on student geometry learning achievement through the results of a questionnaire that has gone through the validation stage. Quizizz makes it easy for users to access and provide detailed assessments, scoring answers not only from the number of questions that can be answered correctly but also the speed of working time. The rest, Quizizz is supported by an attractive and not boring appearance. Research subjects feel challenged to work on geometry problems that have been packaged in the form of online Quizizzes. Assessment that is packaged using the online game Quizizz proves that technology has a positive impact on measurement, formative assessment and challenges educators to be able to use technology that suits student needs (Orhan Göksün & Gürsoy, 2019). The use of online Quizizz quizzes can increase student motivation and have a positive impact on learning outcomes with detailed and transparent information on results (Pitoyo, Sumardi, & Asib, 2020). This statement is in accordance with the opinion of (Darmawan, Daeni, & Listiaji, 2020) which states that the use of Quizizz online quizzes in the pandemic era is very useful for teachers and lecturers because it can show accurate and detailed work results and fast analysis.

The character of student hard work in online lectures on learning achievement has an effect of 46%. The hard work of students in online lectures is seen in the results of filling out a questionnaire that has been declared valid. The character of hard work can be seen from the efforts of students in taking online lectures and doing assignments seriously, on time, and not giving up easily. According to (Purwati, Rochmad, & Wuryanto, 2018), the character of hard work, especially in online learning, is needed especially to solve math problems that involve higher-order thinking skills. The rest, (Santika, 2020) argues that character values are things that affect learning output so that educators need to innovate to be able to shape character through media and learning strategies. (Munfarikhatin et al., 2019) states that the character of hard work in learning can be formed by giving tasks that stimulate thinking skills so that they are more serious and do not give up easily when experiencing difficulties.

Online quiz Quizizz and the character of hard work together can have a dominant influence on student achievement by 69%. This shows that the use of the online game Quizizz and the character of hard work has a greater effect on the success of student learning achievement. Game strategies in mathematics learning have been widely used and can improve learning achievement. (Dini, Grisna, Abdullah, Mediany, 2019) states that the use of online quizzes has a positive effect on motivation, enjoyment, engagement and concentration. Based on the research of (Santika, 2020) character education plays an important role, namely forming and developing potential, improvement and strengthening, and as a filter. In online learning, character education must be related to the material directly and with habituation for students to be more serious in lectures.

4. Conclusion

Based on the research results, it can be concluded that the application of online quiz Quizzes and the character of hard work in online learning, especially geometry, has a dominant influence on student achievement. Online quizzes provide access, attractive, accurate, and transparent features to the ability measurement results. Hard work character building can be formed by getting used to giving challenging tasks to complete that involve higher order thinking skills, and timeliness in completing tasks

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