



Analysis of The Effect of The Quizwhizzer Game on Student Learning Motivation Through Assessment for Learning in Islamic Religious Education and Moral Education Subjects

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ABSTRACT

This study was motivated by the low learning motivation of students in Islamic Religious Education and Moral Education subjects, as well as the suboptimal use of the Quizwhizzer game through Assessment for Learning. The purpose of this study was to analyse the effect of the Quizwhizzer game on student learning motivation and to calculate the magnitude of this effect empirically through a quantitative approach. The study used a quasi-experimental method with a nonequivalent control group design. The research subjects consisted of 32 students in class VII C as the experimental group and 32 students in class VII D as the control group at SMPN 1 Prambanan Sleman, selected through purposive sampling. Data were collected using observation sheets and learning motivation scales, then analysed using dependent sample t-tests, independent sample t-tests, and effect size tests (Pearson's r and Cohen's d). The results showed that the Quizwhizzer game through Assessment For Learning had a positive effect on student learning motivation. This was proven by the dependent test with a value of $t(31) = -5.937$, $p = 0.000$ ($p < 0.05$), and the independent test with a value of $t(62) = 5.195$, $p = 0.000$ ($p < 0.05$). The effect size was classified as strong, with a value of $r = 0.55$ and $d = 0.83$ (large effect).

Keywords: *Assessment For Learning, Learning Motivation, Islamic Religious Education and Moral Education, Quizwhizzer.*

ABSTRAK

Penelitian ini dilatarbelakangi oleh rendahnya motivasi belajar siswa pada mata pelajaran PAI dan Budi Pekerti, serta belum optimalnya pemanfaatan game *Quizwhizzer* melalui *Assessment For Learning*. Tujuan penelitian ini adalah untuk menganalisis pengaruh game *Quizwhizzer* terhadap motivasi belajar siswa, serta menghitung besar pengaruhnya secara empiris melalui pendekatan kuantitatif. Penelitian ini menggunakan pendekatan *quasi experimental* dengan desain *nonequivalent control group*. Subjek penelitian terdiri dari 32 siswa kelas VII C sebagai kelompok eksperimen dan 32 siswa kelas VII D sebagai kelompok kontrol di SMPN 1 Prambanan Sleman, yang dipilih melalui teknik *purposive sampling*. Data dikumpulkan menggunakan lembar observasi dan skala motivasi belajar, kemudian dianalisis dengan uji *dependent sample t-test*, *independent sample t-test*, serta uji *effect size* (*pearson's r* dan *cohen's d*). Hasil penelitian menunjukkan bahwa game *Quizwhizzer* melalui *Assessment For Learning* berpengaruh positif dan signifikan terhadap motivasi belajar siswa. Hal ini dibuktikan oleh uji

dependent dengan nilai $t(31) = -5,937$, $p = 0,000$ ($p < 0,05$), serta uji *independent* dengan nilai $t(62) = 5,195$, $p = 0,000$ ($p < 0,05$). Besar pengaruhnya tergolong kuat, dengan nilai $r = 0,55$ dan $d = 0,83$ (*large effect*).

Kata Kunci: *Assessment For Learning, Motivasi Belajar, PAI dan Budi Pekerti, Quizwhizzer*

INTRODUCTION

Learning motivation is an important factor that determines student success in the learning process. Motivation serves as a driver, guide, and reinforcement in achieving learning goals (Khairah et al., 2023). The higher the learning motivation, the more likely students are to actively participate in lessons and develop a deep understanding (Mulia, 2024). Students with high motivation tend to be more active, persistent, and not easily discouraged when facing challenges (Azmi et al., 2024). However, low learning motivation remains one of the fundamental problems in education.

Previous studies have shown that internal and external factors influence low learning motivation. Internal factors include psychological conditions, self-confidence, interest in learning (Sari et al., 2025), goals or aspirations, individual abilities, and students' personal conditions (Ihsani & Nurfarhanah, 2024). External factors include a lack of interaction between teachers and students (Iswardhany & Rahayu, 2020), monotonous and uninteresting teaching methods (Susanti et al., 2024), limited learning facilities (Khairah et al., 2023), an uncondusive learning environment, and minimal parental support for student education (Maptuhah & Juhji, 2021).

The problem of low motivation was also found in Islamic Religious Education and Moral Education (in Indonesian, PAI and Budi Pekerti subjects). In fact, these subjects have a strategic role in shaping students' morals, spirituality, and character. However, in practice, PAI and Budi Pekerti are often considered uninteresting and boring (Nisrina, 2024) because the teaching methods tend to be doctrinal and lecture-dominant (Rahmania et al., 2023). In addition, students often consider them less relevant than other subjects (Sholeh et al., 2024). Observations at SMPN 1 Prambanan, Sleman, also show low student motivation in these subjects. Students appear unenthusiastic, passive in class activities, and often do not complete assignments on time (Observation of PAI and Budi Pekerti in SMPN 1 Prambanan Sleman, 2024). This condition emphasises the need for learning innovations that can increase student motivation.

Various efforts can be made to overcome low student motivation in learning PAI and Budi Pekerti, such as using interesting learning strategies, methods, models, and media. In addition, providing adequate supporting facilities, support, and cooperation between parents and teachers is also very important in increasing student motivation to learn (Nisa' & Fatmawati, 2020). However, one alternative has been less

explored but has great potential in increasing student motivation, namely, through assessment.

Assessment not only serves to measure student achievement but can also be a means of improving the learning process. Assessment for Learning is a form of formative assessment carried out during the learning process (Sam, 2020). This assessment has great potential to increase student motivation because it emphasises constructive feedback, allowing students to recognise their strengths and weaknesses and direct their learning efforts more effectively (Mahshanian et al., 2019).

Previous research shows that Assessment for Learning positively affects student learning motivation (Kesuma, 2014). This motivation is intrinsic and extrinsic through constructive feedback and supportive learning strategies (Panikarova et al., 2021), and it can increase students' sense of autonomy and competence (Leenknecht et al., 2021). Assessment for Learning strategies can be implemented by delivering clear learning objectives, providing evidence of achievement, appropriate feedback, motivation as a source of learning, and motivation for self-assessment (Wafubwa, 2020). Thus, Assessment for Learning can be an alternative to increase student motivation in learning PAI and Budi Pekerti.

In practice, Assessment For Learning can be combined with educational game-based media. One example is Quizwhizzer, an interactive quiz-based game that allows teachers to compile questions in the form of competitions with interesting game paths (Iskandar et al., 2023). This game can increase student engagement and provide useful immediate feedback to improve the learning process (Wahyuningsih et al., 2021). Quizwhizzer also features scores, rankings, and rewards that align with the concept of Assessment for Learning, thereby strengthening students' interest and building their motivation to learn (Hidayatika & Nurhamidah, 2024 Nainggolan et al., 2024). This aligns with learning motivation theory, emphasising the importance of rewards, competition, feedback, learning objectives, and new experiences in enhancing student motivation (Latipah, 2017).

However, research that specifically analyses the effect of the Quizwhizzer game on learning motivation through Assessment for Learning is still limited, especially in the context of PAI and Budi Pekerti. Thus, this study aims to analyse the effect of the Quizwhizzer game on student learning motivation through Assessment for Learning in PAI and Budi Pekerti subjects and to calculate the magnitude of its effect empirically through a quantitative approach.

METHODS

The type of research is quasi-experimental, with a nonequivalent control group design. This design involves two groups that are not randomly selected, but rather formed naturally in the classroom (Hastjarjo, 2019). The experimental group was given

treatment using the Quizwhizzer game through Assessment For Learning, while the control group was given treatment using conventional techniques.

The research subjects were seventh-grade students at SMPN 1 Prambanan Sleman in the 2024/2025 academic year. The research subjects comprised 32 seventh-grade C students as the experimental group and 32 seventh-grade D students as the control group. The subjects were selected using purposive sampling with certain considerations (Rahim et al., 2021).

Learning motivation data were collected using a 4-point Likert scale consisting of 20 statements (favourable and unfavourable). This scale was administered during the pretest and posttest for both groups. In addition, observations were made using the Quizwhizzer game through Assessment for Learning using a checklist observation sheet. The results of the observation showed that the implementation of the Quizwhizzer game reached 95%.

The learning motivation scale instrument was tested for validity and reliability. Content validity was tested through expert judgment, while item validity was tested using corrected item-total correlation. All statement items were declared valid because the calculated r value was > 0.3 (Azwar, 2020). The reliability test using Cronbach's Alpha produced a coefficient of 0.898 (> 0.7), so the instrument was declared reliable (Yusup, 2018).

The data were analysed in two stages, namely descriptive analysis and inferential analysis. Descriptive analysis was used to describe the pretest and posttest scores of student learning motivation in both groups. Inferential analysis was used to test the hypothesis and analyse the effect of the treatment. The tests used were the dependent sample t-test (difference between pretest and posttest within the group), independent sample t-test (difference in results between groups), and effect size tests (Pearson's r and Cohen's d) to determine the magnitude of the effect of the Quizwhizzer game. Before testing the hypothesis, normality and homogeneity tests were conducted first.

The normality test was used to test the assumption of normally distributed data (Ahadi & Zain, 2023). This study used the Shapiro-Wilk normality test because it had a random data distribution of less than 50 samples (Haryono et al., 2023). The data is declared normal if the W value with significance (sig.) > 0.05 (Santoso, 2018). Meanwhile, the homogeneity test serves to determine whether the data groups originate from the same variance (Usmadi, 2020). This study used Levene's test for homogeneity, with data declared homogeneous if it had an F value with a significance > 0.05 (Santoso, 2018).

The effect size test used the Pearson r correlation and Cohen's d formulas. The following are the formulas and categorisation tables:

$$\text{Pearson's } r \text{ formula (Field, 2018)} r = \sqrt{\frac{t^2}{t^2 + df}}$$

Explanation:

t = t skor df = degree of freedom

Cohen's d formula

$$d = \frac{\bar{X}_1 - \bar{X}_2}{S_p} \quad S_p = \sqrt{\frac{(N_1 - 1)S_1^2 + (N_2 - 1)S_2^2}{N_1 + N_2 - 2}}$$

Explanation:

\bar{X}_1 = Mean of the experimental group

\bar{X}_2 = Mean of the control group

S_1 = Std. Deviation of the experimental group

S_2 = Std. Deviation of the control group

N_1 = Number of samples in the experimental group

N_2 = Number of samples in the control group

Table 1. Effect Size Value Categorisation (Field, 2018)

Effect Size Value Pearson's r	Effect Size Value Cohen's d	Category
$0,1 \leq r < 0,3$	$0,2 \leq d < 0,5$	Small effect
$0,3 \leq r < 0,5$	$0,5 \leq d < 0,8$	Medium effect
$r \geq 0,5$	$d \geq 0,8$	Large Effect

RESULT

1. Description of Pretest and Posttest Results for the Experimental and Control Groups

Table 2. Experimental Pretest and Posttest Result

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Experimental Pretest	32	21	48	69	59,25	5,725
Experimental Posttest	32	22	58	80	68,25	6,486

Based on the analysis above, the average pretest score for student learning motivation in the experimental group was 59.25 with a standard deviation of 5.725. After being given treatment using the Quizwhizzer game, the average posttest score increased to 68.25 with a standard deviation of 6.486. The minimum and maximum scores increased from 48–69 to 58–80, respectively. This average increase of 9 points indicates a significant change in student learning motivation after the Quizwhizzer game treatment through Assessment For Learning.

Table 3. Control Pretest and Posttest Results

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Control Pretest	32	26	49	75	62,78	5,906
Control Posttest	32	33	43	76	62,44	7,448

Based on the analysis above, the average pretest score for learning motivation in the control group was 62.78 with a standard deviation of 5.906. After assessment using conventional techniques, the average posttest score decreased

to 62.44 with a standard deviation of 7.448. The minimum score decreased from 49 to 43, while the maximum score increased slightly from 75 to 76. The average decrease of 0.34 points indicates that there was no significant change in student learning motivation in the control group. These results can be used as a basis for further analysis with inferential analysis through hypothesis testing and effect size testing.

2. Hypothesis Testing

Hypothesis testing is used to make decisions based on research data regarding a statistical assumption (hypothesis). This hypothesis testing was conducted using a dependent sample t-test and an independent sample t-test.

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a. Dependent Sample T-Test

Prerequisite Test (Normality Test)

The data used is the gainscore data of the experimental and control groups. The calculation is performed using the Shapiro-Wilk formula with the help of the IBM SPSS 26 for Windows program. The results are as follows:

Table 4. Shapiro Wilk Normality Test Results (Dependent Sample T-Test)

Group	statistic	df	Sig.	Decision
Experimental Gainscore	0,971	32	0,539	Normal
Control Gainscore	0,938	32	0,068	Normal

The results of the Shapiro-Wilk normality test above show that the data in the experimental group has a value of $W = 0.971$, $p = 0.539$, and the control group has a value of $W = 0.938$, $p = 0.068$. Both significance values are greater than 0.05, so the data in both groups are declared to be normally distributed. Thus, the analysis can be continued with a dependent sample t-test.

Dependent Sample T-Test

Table 5. Results of the Dependent Sample T-Test for the Experimental Group

Pair 1	Mean	N	Std. Deviation	Std. Error Mean
Experimental Pretest	59,25	32	5.725	1.012
Experimental Posttest	68,25	32	6.486	1.147

Pair 1	Mean	Std. Deviation	Std. Error Mean	lower	Upper	t	df	Sig. (2-Tailed)
Experimental Pretest-Posttest	-9,000	8,576	1,516	-12,092	-5,908	5,906	31	0,000

The results of the dependent sample t-test on the experimental group above show a $t(31)$ value of -5.937 with $p = 0.000$ ($p < 0.05$). This indicates a significant difference between the pretest and posttest scores in the experimental group. The average score increased from 59.25 to 68.25, which shows that the Quizwhizzer game treatment through Assessment For Learning had a positive effect on student learning motivation in PAI and Budi Pekerti subjects.

b. Independent Sample T-test

Prerequisite Test (Normality Test)

Table 6. Results of the Shapiro Wilk Normality Test (Independent Sample T-Test)

Group	Statistic	df	Sig.	Decision
Experimental Pretest	0,966	32	0,402	Normal
Control Pretest	0,983	32	0,878	Normal
Experimental Posttest	0,945	32	0,105	Normal
Control Posttest	0,964	32	0,349	Normal

The results of the Shapiro-Wilk normality test above show that all pretest and posttest data in the experimental and control groups have a significance value greater than 0.05 ($p > 0.05$), namely the experimental pretest ($W(32) = 0.966$, $p = 0.400$), control pretest ($W(32) = 0.983$, $p = 0.878$), experimental posttest ($W(32) = 0.945$, $p = 0.105$), and control posttest ($W(32) = 0.964$, $p = 0.349$). Thus, the data are normally distributed and meet the requirements for performing a homogeneity test.

Prerequisite Test (Homogeneity Test)

The homogeneity test was used to ensure that the variance of the data in the experimental and control groups was homogeneous. The calculation was performed using Levene's formula with the help of IBM SPSS 26 for Windows. The following are the results of the homogeneity test:

Table 7. Results of Levene's Homogeneity Test

Variabel	Levene's Statistic	df1	df2	Sig.
<i>Pretest</i>	0,065	1	62	0,800
<i>Posttest</i>	0,011	1	62	0,919

The results of Levene's homogeneity test above show that the variance of the pretest and posttest between the experimental and control groups is homogeneous. In the pretest data, $F(1,62) = 0.065$ with $p = 0.800$, and in the posttest data, $F(1,62) = 0.011$ with $p = 0.919$. Both data sets show a significance value of more than 0.05, so it can be concluded that there is no significant difference in variance between the experimental and control groups at the pretest and posttest stages. Thus, the data meet the assumption of homogeneity and are suitable for analysis using the independent sample t-test.

Independent Sample T-Test

After the normality and homogeneity tests were fulfilled, an independent sample t-test was conducted. This test was performed on the pretest scores first to ensure that the learning motivation of students in both groups was at the same level before receiving treatment. The following are the results of the independent sample t-test on the pretest scores:

Table 8. Results of the Independent Sample T-Test (Pretest)

	Mean	N	Std. Deviation	Std. Error Mean
<i>Experimental Pretest</i>	59,25	32	5,725	1,012
<i>Control Pretest</i>	62,78	32	5,906	1,044

	F	Sig.	t	df	Sig (2-Tailed)	Mean Diff.	Std. Error Diff.	Lower	Upper
<i>Equal variances assumed</i>	0,065	0,800	-2,428	62	0,018	-3,531	1,454	-6,438	-0,625
<i>Equal variances not assumed</i>			-2,428	61,94	0,018	-3,531	1,454	-6,438	-0,625

Based on the results of the independent sample t-test on the pretest scores above, a t-value (62) = -2.428, df = 62, with a significance value of 0.018 ($p < 0.05$) was obtained. This shows that there was a significant difference in learning motivation between the experimental and control groups before the treatment. Therefore, further analysis was not conducted using the posttest scores, but rather using the gainscore values of each group to determine their effect. The following are the results of the independent sample t-test using the gainscore values:

Table 9. Independent Sample T-Test Results (Gainscore)

	Mean	N	Std. Deviation	Std. Error Mean
Experimental Gainscore	9,00	32	8,576	1,516
Control Gainscore	-0,34	32	5,475	0,986

	F	Sig.	t	df	Sig (2-Tailed)	Mean Diff.	Std. Error Diff.	Lower	Upper
<i>Equal variances assumed</i>	10,08	0,002	5,195	62	0,000	9,344	1,799	5,748	12,939
<i>Equal variances not assumed</i>			5,195	52,66	0,000	9,344	1,799	5,736	12,952

The results of the independent sample t-test on the gainscore values above show a significant difference between the experimental and control groups, with a t-value (62) = 5.195 and p = 0.000 (p < 0.05). The average gainscore value of the experimental group was 9.00, while the control group showed a decrease of -0.34. Thus, it can be concluded that the use of the Quizwhizzer game affects student learning motivation.

Thus, based on the results of the dependent sample t-test and independent sample t-test, it can be concluded that the Quizwhizzer game has a positive and significant effect on student learning motivation through Assessment For Learning in PAI and Budi Pekerti subjects.

3. Effect Size Test

The analysis of the magnitude of influence in this study was conducted using an effect size test. The following are the results of the Pearson's r correlation effect size test and Cohen's d effect size test:

$$r = \frac{5,195^2}{\sqrt{5,195^2 + 62}}$$

$$r = \frac{26,988}{\sqrt{26,988 + 62}}$$

$$r = \frac{26,988}{\sqrt{88,988}}$$

$$r = 0,55$$

$$d = \frac{68,25 - 62,44}{Sp}$$

$$Sp = \sqrt{\frac{(32 - 1)6,486^2 + (32 - 1)7,448^2}{32 + 32 - 2}}$$

$$d = \frac{5,81}{\sqrt{\frac{(31)6,486^2 + (31)7,448^2}{62}}}$$

$$d = \frac{5,81}{\sqrt{\frac{(31)42 + (31)56}{62}}}$$

$$d = \frac{5,81}{\sqrt{\frac{1302 + 1736}{62}}}$$

$$d = \frac{5,81}{\sqrt{\frac{1302 + 1736}{62}}} = 0,83$$

Based on the effect size calculation above, the values r = 0.55 and d = 0.83 were obtained. Referring to the effect size category (Field, 2018), these values are classified as large effects, because r > 0.50 and d ≥ 0.80. Thus, the use of the Quizwhizzer game has a large effect on student learning motivation through Assessment For Learning in PAI and Budi Pekerti subjects.

DISCUSSION

The results of the study indicate that the Quizwhizzer game analysis has a positive and significant effect on student learning motivation through Assessment For Learning in PAI and Budi Pekerti subjects. This is evidenced by the results of the dependent sample t-test on the experimental group, which produced a value of t(31) =

-5.937 with $p = 0.000$ ($p < 0.05$). Descriptively, student learning motivation increased from an average score of 59.25 on the pretest to 68.25 on the posttest. This means that student learning motivation increased after being given treatment using the Quizwhizzer game.

Furthermore, the results of the independent sample t-test between the experimental and control groups showed a value of $t(62) = 5.195$ with $p = 0.000$ ($p < 0.05$). The difference in the average gainscore was also quite clear, namely 9 in the experimental group compared to -0.34 in the control group. These findings indicate that the increase in learning motivation was greater among students who took the assessment using the Quizwhizzer game than those who used conventional techniques.

The analysis of the effect size of the Quizwhizzer game was calculated using the effect size test. The results showed a Pearson's r value of 0.55 and a Cohen's d value of 0.83. Both results fall into the large effect category. Thus, it can be concluded that the effect of the Quizwhizzer game through Assessment For Learning is not only statistically significant but also practically strong.

This success is inseparable from the principles of Assessment For Learning and learning motivation theory integrated into the Quizwhizzer game. First, the active involvement of students through interactive quizzes with attractive visual displays encourages higher participation. Second, the provision of immediate feedback allows students to correct their mistakes immediately. Third, the score, ranking, and reward features boost confidence and motivate students to compete. Fourth, the results provide an opportunity for self-reflection so that students focus more on improving their weaknesses.

The results of this study align with the findings of Hermawan & Suharto (2025), which reveal that using Quizwhizzer in learning models can increase students' interest and motivation to learn. Az-Zahro & Setyowibowo (2024) also reported that the Quizwhizzer game can increase motivation to learn in Economics and General Administration subjects. Linda & Suryadi (2025) added that Quizwhizzer, as a learning medium, can increase student motivation in geometry. Research by Assyura (2023) supports this finding, showing that using Quizwhizzer positively impacts student motivation and learning outcomes in digestive system material. At the same time, Lubis & Meiriza (2025) found a positive impact on employment material. Furthermore, these findings align with the Assessment For Learning theory, which emphasises the importance of continuous feedback and active student involvement in the learning process to encourage learning motivation (Wafubwa, 2020; Leenknecht et al., 2021).

Thus, this study strengthens the empirical evidence that educational games such as Quizwhizzer, combined with Assessment For Learning, can be an innovation in

increasing student learning motivation, especially in PAI and Budi Pekerti learning, which have been considered less interesting.

CONCLUSION

Based on the results of the analysis, this study shows that the Quizwhizzer game applied through Assessment For Learning can positively and significantly increase student motivation in PAI and Budi Pekerti subjects. The results of the dependent sample t-test on the experimental group showed a t-value (31) = -5.937, $p = 0.000$ ($p < 0.05$). The results of the independent sample t-test showed a t-value (62) = 5.195, $p = 0.000$ ($p < 0.05$). The magnitude of the effect is classified as a large effect. This is demonstrated by the effect size test analysis using Pearson's r and Cohen's d formulas, which produced values of $r = 0.55$ ($r > 0.5$) and $d = 0.83$ ($d > 0.8$). This proves that the integration of the Quizwhizzer game has a positive effect and is empirically strong.

DECLARATIONS

Author contribution statement

The author designed the research, developed the methodological design, and collected data at SMPN 1 Prambanan Sleman. The author analysed the data using relevant statistical tests and interpreted the research results. Furthermore, the author drafted, revised, and refined the manuscript until it was ready for publication. The author carried out all stages of research and article writing independently. Hopefully, the results of this study can be used by PAI and Budi Pekerti teachers in increasing student motivation in the learning process.

Additional information

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