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The Effect of Using Zeep Quiz as a Learning Medium on Learning Outcomes and Islamic Character Values of Students At SMA Negeri 13

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ABSTRACT
This study is motivated by low student learning outcomes and the weakening internalization of Islamic character values caused by teacher-centered instruction and conventional assessment practices. The study aims to analyse the effect of using ZEEP Quiz, a gamification-based learning medium, on the learning outcomes and Islamic character values of students at SMA Negeri 13. A quantitative approach was employed using a quasi-experimental method with a nonequivalent control group design. The sample consisted of 64 grade-X students selected purposively, comprising 32 students in the experimental class and 32 students in the control class. The research instruments were a multiple-choice achievement test and a Likert-scale questionnaire on Islamic character values. Data were analysed using normality tests, homogeneity tests, independent sample t-tests, N-Gain, and multivariate analysis of variance. The results show that the learning outcomes of the experimental class (84.06) were significantly higher than those of the control class (75.31) with a significance value of 0.000 < 0.05, and the Islamic character score of the experimental class (4.21) exceeded that of the control class (3.68). These findings confirm that interactive digital quiz media function not merely as assessment tools but also as instruments for cultivating honesty, trustworthiness, and discipline among students.

Keywords: ZEEP Quiz, Learning Media, Learning Outcomes, Islamic Character

INTRODUCTION
Digital transformation has fundamentally reshaped the landscape of education delivery, from how teachers present material and how students access learning resources, to how schools conduct assessment. Technology is no longer positioned merely as a complement (Kemmis, McTaggart, & Nixon, 2014), but rather as a strategic component that determines the quality of the learning process and its outcomes. Technological innovation has been shown to serve as an important mediator in strengthening students' engagement and loyalty toward educational institutions (Susilawati et al., 2021). This accelerated use of digital technology requires teachers to have the competence to design learning that fully integrates content, pedagogy, and technology (Susilawati & Khaira, 2021a), while also being able to adapt learning designs to the demands of the Society 5.0 era (Khaira et al., 2021).

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Conditions on the ground, however, do not yet fully align with these demands. Preliminary observations conducted by the researcher at SMA Negeri 13 revealed that instruction is still dominated by lecturing, written assignments, and paper-based daily tests. This pattern places students in a passive position, reduces learning concentration, and contributes to low achievement scores (Kosasih, 2014). Teacher documentation data show that more than half of the tenth-grade students had not reached the minimum mastery criteria on the mid-semester summative assessment. Yet selecting appropriate media is a key determinant of learning success, since media function as a bridge between the instructional message and students' cognitive structure (Susilawati et al., 2023a). This condition is also linked to the weak critical-thinking skills of secondary school students, which remain in the low-to-moderate category (Susilawati et al., 2020).

An equally pressing issue is the weakening internalization of Islamic character values among students. Cheating during exams, late assignment submissions, low individual responsibility, and impolite behavior in digital communication all indicate that character strengthening has not yet been running optimally (Hamalik, 2015). Previous studies have confirmed that the use of digital-technology-based assessment models contributes meaningfully to shaping students' noble character (akhlakul karimah) (Susilawati et al., 2023d), while also curbing academic dishonesty through transparent and measurable assessment mechanisms (Susilawati & Khaira, 2022). These findings show that assessment technology carries an affective dimension that has rarely been explored at the senior-high-school level, even though tolerance and religious character need to be cultivated early through well-planned instruction (Susilawati et al., 2023g).

ZEEP Quiz has emerged as one of the gamification-based digital quiz platforms that allows teachers to design interactive questions, display real-time leaderboards, and provide instant feedback to students. Gamification features such as point acquisition, time-limited challenges, and healthy competition have the potential to increase learning engagement (Arsyad, 2014). Previous research reports that implementing ZEEP Quiz can gradually increase students' learning interest cycle by cycle (Fauzi & Hidayah, 2025), and improve conceptual understanding through a game-based learning model (Putri et al., 2023). Nevertheless, most of these studies stop at the general cognitive and affective domains, such as interest and learning motivation.

This is precisely the research gap this study seeks to fill. Research on digital quiz media generally measures learning outcomes alone, while research on Islamic character typically uses a qualitative approach without any media intervention (Rusman, 2017). Few studies have simultaneously examined the effect of a single digital medium on both domains learning outcomes and Islamic character values within the context of a public senior high school. Yet the integration of technology with education grounded in national and religious values has been shown to effectively strengthen students' character in senior high schools in Medan City (Kesuma et al., 2025). The novelty of this study lies in this simultaneous examination using the relatively new ZEEP Quiz platform, which has not been widely studied within the framework of Islamic character education.

Based on this description, the research problems addressed in this study are: (1) is there a significant effect of using ZEEP Quiz as a learning medium on the learning outcomes of students at SMA Negeri 13; (2) is there a significant effect of using ZEEP Quiz on students' Islamic character values; and (3) is there a simultaneous effect of using ZEEP Quiz on both variables. The aim of this study is to analyze and describe the magnitude of the effect of using ZEEP Quiz on students' learning outcomes and Islamic character values, so that the results can serve as an empirical reference for teachers in selecting evaluation media that are both educational and morally valuable.

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The main contribution of this study lies in positioning digital assessment media not merely as a technical measurement tool, but as an instrument of value education. This study is thus expected to make a theoretical contribution to the development of character-oriented educational technology research, as well as a practical contribution for teachers and school administrators in designing formative assessments that are educational in nature.

METHOD

This study employed a quantitative approach with a quasi-experimental method. The design used was a nonequivalent control group design, involving two subject groups an experimental class and a control class that were not purely randomly selected, with a pretest and posttest administered to both groups. The experimental class received instruction using ZEEP Quiz media, while the control class received conventional instruction with written evaluation. This design was chosen because the classes were already pre-formed, making individual randomization impossible without disrupting the school's teaching schedule.

The study was conducted at SMA Negeri 13 during the odd semester of the 2025/2026 academic year, over eight meetings. The population consisted of all 192 tenth-grade students, spread across six class groups. The sample was determined using a purposive sampling technique, based on the equivalence of average initial scores, number of students, and having the same subject teacher. Based on these considerations, two classes were selected as the sample class X-2 as the experimental class and class X-3 as the control class with a total of 64 students, as presented in Table 1.

Table 1. Research Sample

No	Class	Male	Female	Total
1	X-2 (Experimental)	14	18	32
2	X-3 (Control)	15	17	32
	Total	29	35	64

The data collection instruments consisted of two types. First, a 30-item multiple-choice achievement test developed based on learning outcome indicators and covering the cognitive domains C1 through C4. Item construction followed assessment development principles requiring measurability, content representativeness, and alignment with learning objectives (Susilawati, 2021). Second, a 30-item Islamic character values questionnaire using a five-point Likert scale, developed from five indicators: shiddiq (honesty), amanah (responsibility), istiqamah (discipline), ukhuwah (cooperation), and adab in digital communication.

Instrument trials were conducted on 30 students outside the sample. Item validity was tested using product-moment correlation, showing that 28 test items and 27 questionnaire items were valid. Test reliability, calculated using KR-20, yielded a coefficient of 0.842, while questionnaire reliability, calculated using Cronbach's Alpha, yielded a coefficient of 0.891, indicating that both instruments were reliable. Data collection was supplemented with observation of lesson implementation and documentation of student activity reports automatically generated by the ZEEP Quiz system.

Data analysis was carried out in two stages. The prerequisite stage included a normality test using Kolmogorov-Smirnov and a homogeneity of variance test using Levene's test. The hypothesis-testing stage used an independent-sample t-test for each dependent variable, N-Gain calculations to measure the magnitude of improvement, Cohen's d effect size to gauge the strength of the effect, and multivariate analysis of variance (MANOVA) to test the simultaneous effect of the treatment on learning outcomes and Islamic character values.

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RESULTS AND DISCUSSIONS

Description of Students' Learning Outcomes

The measurement results show that both classes started from relatively equal points. The average pretest score was 62.19 for the experimental class and 61.56 for the control class, a difference that was not significant. After eight meetings of treatment, the average posttest score of the experimental class rose to 84.06, while the control class only reached 75.31. A summary of the data is presented in Table 2.

Table 2. Description of Learning Outcomes for the Experimental and Control Classes

Class	N	Pretest	SD	Posttest	SD
Experimental	32	62.19	8.41	84.06	6.72
Control	32	61.56	8.77	75.31	7.45

This improvement is reinforced by the N-Gain calculation. The experimental class obtained an N-Gain score of 0.58, classified as moderate approaching high, while the control class obtained 0.36, at the lower boundary of the moderate category. The 0.22-point difference indicates that the improvement in understanding among students learning with ZEEP Quiz occurred more quickly and more evenly than among students who learned conventionally.

Prerequisite Tests and Hypothesis Testing

The Kolmogorov-Smirnov normality test produced significance values above 0.05 for all data groups, so the data were declared normally distributed. Levene's homogeneity test also produced a significance value above 0.05, so the variances of the two groups were declared homogeneous. With both prerequisites met, hypothesis testing proceeded using parametric statistics. A summary of the test results is presented in Table 3.

Table 3. Independent Sample t-Test and Effect Size Results

Variable	t value	df	Sig. (2-tailed)	Cohen's d	Note
Learning outcomes	4.943	62	0.000	1.24	Significant
Islamic character	5.187	62	0.000	1.30	Significant

The significance value of 0.000 was smaller than 0.05 for both variables, so the null hypothesis was rejected and the alternative hypothesis accepted. Cohen's d values of 1.24 and 1.30 fall into the large category, meaning the treatment differed not only statistically but was also practically meaningful in the classroom. The MANOVA analysis produced a Pillai's Trace value of 0.412 with $F(2,61) = 21.37$ and a significance of 0.000, confirming a simultaneous effect of using ZEEP Quiz on learning outcomes and Islamic character values together.

Description of Islamic Character Values

Islamic character was measured before and after the treatment using a score range of 1 to 5. The average initial score was 3.29 for the experimental class and 3.26 for the control class. After the treatment, the average for the experimental class rose to 4.21, while the control class rose only to 3.68. Details of each indicator's achievement are presented in Table 4.

Table 4. Comparison of Islamic Character Value Indicator Scores (Posttest)

No	Indicator	Experimental	Control	Difference
1	Shiddiq (honesty)	4.28	3.71	0.57
2	Amanah (responsibility)	4.24	3.70	0.54
3	Istiqamah (discipline)	4.19	3.66	0.53
4	Ukhuwah (cooperation)	4.26	3.69	0.57

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No	Indicator	Experimental	Control	Difference
5	Digital communication etiquette (adab)	4.08	3.64	0.44
	Average	4.21	3.68	0.53

The honesty and cooperation indicators recorded the highest differences, at 0.57 points. This finding is logical because the ZEEP Quiz mechanism displays answers and scores in real time, leaving students no room to manipulate results, while also encouraging cooperation in group quiz mode. The digital communication etiquette indicator recorded the lowest difference, indicating that cultivating polite communication habits in digital spaces requires a longer intervention than eight meetings.

The Effect of ZEEP Quiz on Learning Outcomes

The superior learning outcomes of the experimental class are consistent with prior findings that the use of technology-based learning media consistently produces higher learning achievement than conventional instruction (Susilawati, 2018). A similar pattern is seen in the application of blended learning in civics courses, where technology supports learning interaction (Susilawati, 2017). The theoretical explanation lies in the reduction of extraneous cognitive load: the instant feedback provided by ZEEP Quiz allows students to correct misconceptions at the moment errors occur, rather than days later once the learning context has faded. A similar mechanism has been reported for digital-based assessment models that improve learning outcomes by accelerating the feedback cycle (Susilawati et al., 2023c).

Increased learning activity also serves as an intervening variable explaining this finding. Digital-technology-based assessment models have been shown to increase student learning activeness because they require every individual to participate on every item (Susilawati et al., 2022a). In this study's context, the real-time leaderboard and time limits created positive pressure that engaged all students, unlike paper tests, which allow some students to delay engagement until the last minute. This strengthens the argument that learning strategies positioning students as active subjects have a direct impact on academic achievement (Susilawati, 2020). Relatedly, differentiated learning that adapts to students' learning needs has also been shown to meaningfully improve learning outcomes (Miqwati et al., 2023).

The Effect of ZEEP Quiz on Islamic Character Values

The findings on the Islamic character variable represent this study's most notable contribution. The 0.57-point increase in the honesty indicator reinforces the proposition that digital assessment instruments function as character-shaping tools, not merely measurement instruments. Prior research shows that digital assessment models can both measure and shape students' honest behavior by closing off opportunities to manipulate answers (Susilawati et al., 2023b). This is also consistent with findings that the adoption of automated assessment affects academic integrity through the mediating role of students' moral self-regulation (Susilawati et al., 2023f), as well as shaping character values among university students more broadly (Susilawati et al., 2022b). In other words, honesty does not grow solely from teachers' advice, but from an assessment system structurally designed to reward honesty.

Character formation through technology can also be explained through a character education framework that places habituation at the core of the value-internalization process (Khoiri et al., 2023). Consistently scheduled daily quizzes accustom students to completing their obligations on time, which in Islamic values corresponds to amanah (trustworthiness) and istiqamah (steadfastness). Studies of digital assessment models in Islamic education study programs likewise confirm that digital assessment can be designed in alignment with Islamic values without reducing the objectivity of measurement (Susilawati et al., 2025c).

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In addition, using ZEEP Quiz indirectly trains students' digital literacy. Digital literacy is a prerequisite for responsible citizen engagement, including polite behavior in digital public spaces (Susilawati, 2024b). The relatively low difference in the digital communication etiquette indicator in this study actually reinforces this view, since building digital etiquette requires sustained mentoring and teacher role-modeling, not merely exposure to technology. The dynamics of teacher–student interaction remain a key factor in building character (Susilawati, 2024a).

Implications and Limitations of the Study

From the standpoint of technology acceptance, the successful implementation of ZEEP Quiz cannot be separated from students' perceived usefulness and perceived ease of use. Technology Acceptance Model analysis shows that these two perceptions determine the level of acceptance and continued use of technology in learning (Susilawati et al., 2025a). The researcher's observations found that students needed only one meeting to master the ZEEP Quiz interface, so learning time was not consumed by technical issues. This is important because the operational efficiency of instruction is strongly influenced by the level of digital technology adoption in the teaching and learning process (Susilawati et al., 2023e).

This study's findings also reinforce the direction of smart-technology-based education development. Sustainable education planning requires the measured, value-oriented use of artificial intelligence and digital platforms (Marisa et al., 2024), including the use of AI-based platforms to enhance teacher professionalism (Susilawati et al., 2025b). At a practical level, learning models in the metaverse era position gamification as a bridge between digital experience and the achievement of learning objectives (Susilawati, 2023). ZEEP Quiz is one concrete form of that bridge at the senior-high-school level.

This study's implications are twofold. Theoretically, it extends the study of digital learning media by incorporating the dimension of Islamic character as a dependent variable that has rarely been tested quantitatively. Practically, the findings suggest that teachers should position digital quizzes not as a diversion but as a planned part of formative assessment design. Schools need to ensure stable internet network availability and provide training for teachers in developing quality instructional materials and test items, since the quality of the medium is ultimately determined by the quality of the content it carries (Susilawati & Khaira, 2021b).

This study has several limitations that need to be acknowledged. First, the eight-meeting treatment duration is relatively short for measuring long-term character change. Second, character was measured using a self-report questionnaire, which may carry social desirability bias. Third, the study was limited to a single school, so generalization of the findings should be made cautiously. Further research is recommended to use a longitudinal design, combine questionnaires with behavioral observation and in-depth interviews, and broaden the scope of schools and subjects covered.

CONCLUSIONS

Based on the data analysis and discussion, it can be concluded that the use of ZEEP Quiz as a learning medium has a significant effect on the learning outcomes of students at SMA Negeri 13, as shown by the experimental class's average posttest score of 84.06 compared to the control class's 75.31, with a significance value of $0.000 < 0.05$. The use of ZEEP Quiz also had a significant effect on students' Islamic character values, with an average score of 4.21 in the experimental class compared to 3.68 in the control class. The multivariate test results confirm a simultaneous effect of the treatment on both variables.

Conceptually, this study builds the argument that gamification-based digital quiz media serve a dual function: as an instrument for strengthening mastery of material and as a vehicle for cultivating the values of honesty, trustworthiness, discipline, and cooperation. The study's theoretical contribution lies in positioning Islamic character as a dependent variable in the study

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of digital learning media, a combination still rarely tested empirically. Its practical implication is that teachers and schools need to integrate digital quiz media into formative-assessment planning in a programmed way, accompanied by guidance on digital etiquette so that technology use proceeds hand in hand with the strengthening of moral character. The limitations of treatment duration, the use of a self-report questionnaire, and the single-school scope open room for further longitudinal research with a broader sample.

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