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Multiple Linear Regression Analysis: Game Quiz-Based Learning Media on Experience and Satisfaction

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Abstract: The purpose of this study is to explore the effect of quiz- and game-based learning media on student learning experiences and satisfaction. This study models the relationship between media, motivation, experience, and learning satisfaction differently from previous studies with single variables. The research method uses a multiple linear regression approach with data collected through a Likert scale questionnaire. The research subjects consisted of 107 tenth-grade students majoring in Network and Computer Engineering at SMK Bhinneka Karya Simo. Data processing was carried out using Python and Microsoft Excel software for data analysis. The results showed that the variables of media, motivation, and response had a significant effect on learning experience ($p < 0.05$). The regression equations obtained were: experience (Y2) = 0.5918 + 0.2594X1 + 0.2840Y1, while satisfaction (Y3) = 0.5918 + 0.2594X1 + 0.2840Y1 + 0.3239Y2. In conclusion, learning experience is mainly influenced by media and motivation, while learning satisfaction is influenced by media, motivation, and the experience itself. These findings confirm that game-based learning strategies can create more meaningful learning experiences and encourage increased student satisfaction, which can be used as a basis for improving the quality of learning in the classroom.

Keywords: Games, Learning, Multiple Linier Regression ,Quiz

INTRODUCTION

Vocational High School (SMK) is an educational unit that provides vocational education at the secondary level. SMK BHINNEKA KARYA SIMO is one of the educational units located in Boyolali Regency, Central Java Province. SMK BHINNEKA KARYA SIMO has 5 vocational departments: Automotive Engineering, Welding Engineering, Motorcycle Engineering, Industrial Machine Engineering, and Computer Network Engineering. Learning is an interactive activity between students, educators, and learning resources within the educational unit environment. Curriculum is a set of plans and arrangements regarding learning objectives, content, and materials, as well as guidelines used in the implementation of learning to achieve specific educational goals. The concepts in the Merdeka Curriculum guide learning activities to be interactive, inspiring, enjoyable, challenging, and motivating for students to participate actively (Kementerian Pendidikan, 2024).

The development of information and communication technology (ICT) has brought significant impacts across various fields, including education. Technology-based learning media is rapidly evolving to meet the educational needs that demand flexibility, interactivity, and innovation in content delivery(Belinda et al., 2024). With the advent of technology-based learning media, these various limitations can be overcome thru the presentation of material that is more visual, interactive, and accessible anytime, anywhere. Technology-based learning media plays a strategic role in improving the quality of learning. Thru platforms like Learning Management Systems (LMS), game-based learning, interactive simulations, and mobile applications, students can actively engage in learning. This active involvement aligns with the constructivist approach, which emphasizes that knowledge is constructed thru direct learning experiences and interaction with the environment. One important aspect affected by the use of technology-based media is learning motivation. Motivation can be fostered thru learning experiences that provide autonomy, competence, and social connection. Technology-based media can support this aspect thru features like instant feedback, challenging activities, and collaborative interaction.

Multiple Linear Regression (MLR) is a statistical method used to estimate how several independent factors collectively influence a single outcome (dependent). This method shows how each factor affects the outcome when

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other factors remain constant. The purpose of MLR is to model the linear relationship between explanatory factors and the response factor. The multiple linear regression model is capable of incorporating more than one independent factor in predicting the dependent factor (Ardiningrum et al., 2025). In this study, the author focuses on the influence of using digital learning media in the quiz game model on motivation, experience, and satisfaction in participating in Informatics learning activities at Bhinneka Karya Simo Vocational High School. Data analysis using multiple linear regression methods reveals the relationship between these factors.

This study also attempts to fill the gaps in previous research by empirically analyzing how the application of game-based learning media affects the motivation, experience, and learning satisfaction of students. This approach was conducted through the application of a multiple linear regression model, enabling quantitative and objective testing of the simultaneous relationship between variables. Thus, this study not only provides statistical evidence regarding the effectiveness of game media in learning but also contributes practically to the development of innovative learning strategies oriented toward improving learning experiences and student satisfaction at the educational.

LITERATURE REVIEW

In recent years, the integration of technology in education has become a major focus in the development of digital learning strategies. As digital penetration among students increases, several studies show that learning media can improve the quality of learning in terms of motivation, experience, and satisfaction.

Learning Management System

A Learning Management System (LMS) can be defined as software used to deliver, monitor, and manage the learning or training process. This system provides various key features, such as file storage, a grading system, discussion forums, and evaluation facilities. Its utilization not only focuses on educational aspects but also contributes to developing students' digital skills thru an interactive and flexible learning environment, thereby increasing their interest and positive attitude toward online learning. Research (Nita et al., 2025). Utilizing the Learning Management System (LMS) Edlink for learning efficiency. The research aims to examine the influence of usefulness quality, information quality, and service interaction quality on Edlink user satisfaction. The research instrument was tested for validity and reliability using Pearson. Research data from 110 respondents at Tanjungpura University. Data analysis using a Generalized Linear Model (GLM) is necessary because the data is not normally distributed. The research results indicate a significant impact on user satisfaction. However, the quality of information does not matter, as users feel the available information is already sufficient. All factors were tested simultaneously, and the results showed a significant collective effect.

Game Learning

Game-based learning is a concept of digital learning media that utilizes technology and teaching materials. The application process and activities of its learning are connected to the internet (Safitri et al., 2025). Game-based learning is one of the digital learning models that utilizes game technology and mechanics to achieve learning objectives. This method is designed to increase student engagement, create interactive, engaging, and motivating learning experiences, and motivate students in their learning achievement (Ningsih & Subagyo, 2025). According (Lei et al., 2022) Game-based learning offers the opportunity to transform traditional, often passive learning into more active, collaborative, and creative activities. By integrating game elements and mechanics such as challenges, rewards, and narrative, learners can more easily grasp the concepts being taught.

Mobile Learning

Mobile learning is a digital learning medium that utilizes smartphone technology connected to the internet and can be accessed from various locations. Mobile Learning is a learning model characterized by its independence from time and space (Hamka et al., 2024). By implementing learning using Android-based applications, it is possible to increase motivation and learning outcomes. The use of mobile learning encourages students to participate in learning activities with high motivation.

Based on previous researchers' findings, utilizing technology and learning media influences motivation, experience, and learning (Novianti & Syarkowi, 2021). This study uses the Multiple Linear Regression (MLR) method, which is a statistical method used to analyze the influence of one or more independent variables (predictors) on the dependent variable. The purpose of this research is to build upon previous findings by incorporating several factors that influence students' motivation, experience, and learning satisfaction in participating in learning. It is hoped that the results of this research can broaden insights and have a positive impact on efforts to improve the quality of learning in the classroom.

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METHOD

The method in this study uses a quantitative approach, and data analysis is performed using Multiple Linear Regression. This method is used to analyze the influence of game media as a learning tool. According to this approach, it is done to objectively analyze the relationships between (Sari et al., 2022). The questionnaire is used to understand students' perceptions after participating in game-based learning and its influence on the teaching and learning process. This stage explains the steps taken to analyze the influence of using digital quiz game media on learning activities in the Informatics subject at Bhinneka Karya Simo Vocational High School. The questionnaire consists of 12 questions representing the six factors to be analyzed. This study focuses on the influence of game-learning media on learning experiences and satisfaction. Media was chosen as a factor because it encompasses digital-based learning, games, and the use of smartphone technology, emphasizing that media can improve student understanding, given that the brain is more effective at processing information through a combination of text, images, and sound, as well as games. Furthermore, the motivation factor is based on the theory that intrinsic and extrinsic motivation greatly determines student learning success. Meanwhile, the experience factor is based on the theory of experiential learning, which emphasizes the importance of the learning cycle, starting from concrete experiences, abstract conceptualization, to active experimentation in forming a deep understanding. Finally, the satisfaction variable is positioned as a dependent variable because it reflects students' attitudes, perceptions, and evaluations of the entire learning process.

Data Collection

Data collection was done by distributing questionnaires using a Likert scale with point values from 1 to 5. This research was conducted at Bhinneka Karya Simo Vocational High School, from January to February of the 2024/2025 academic year. In this study, the data was collected from the entire 10th-grade class in the Network and Computer Engineering Department, with a total of 107 students. Out of the 107 research subjects, 68 were female students and 39 were male students.

Factor Identification

After the data is collected, the next step is to identify and group it based on the questionnaire statements that support analysis (Putu et al., 2020). To see the effect of digital game media as a learning media tool, grouped factors include: (X1) Media: tools used as learning media, (X2) Material: teaching materials used in learning, (X3) Interaction: The level of student activeness, (Y1) Motivation: the influence caused by the use of media (Y2) Experience: events influenced by the use of media, (Y3): Satisfaction: Action or response to the media. The questionnaire consisted of 12 questions representing the six factors to be analysed. The list of statements used see Table 1:

Table 1. Instrumen Research

Factor	Statement Quesioner
Media (X1)	Interested in this game-based learning?
	Learning time is too fast when using this game learning?
Material (X2)	Game-based learning makes it easier to learn the material?
	Easy to remember the material after playing this game compared to other learning methods?
Interaction (X3)	Cooperate with friends while playing games in this lesson?
	Games help to interact and discuss with classmates more easily?
Motivation (Y1)	Did this game help you understand the lesson?
	In-game reward system (e.g. points, levels or badges) keeps you motivated to learn?
Experience (Y2)	Games provide challenges that encourage better learning?
	Satisfied with the results provided by the game when completing tasks or challenges?
Satisfaction (Y3)	How do you feel about participating in this game-based learning?
	Does this game match your learning ability?

Data Analysis

In order to test the research instrument according to(Marvianto & Widhiarso, 2018), the questionnaire was distributed to 107 respondents from all students in class X of the Computer and Network Engineering Department at Bhinneka Karya Simo Vocational High School. This test can be done with the method:

a) Validity test is used to determine whether the instrument (questionnaire statement) is valid to measure the desired indicator. This validity test uses the Pearson correlation technique with the help of the Python programming language and Microsoft Excel software. The instrument is considered valid if the calculated r value is greater than the r table (Putu et al., 2020).

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b) Reliability test is used to evaluate the level of consistency of the statements in the questionnaire. Reliability testing is carried out to ensure the validity of the questionnaire. Using the help of the Python programming language and Microsoft Excel software, the instrument results are considered reliable if the Cronbach Alpha value is greater than 0.60-0.70.

c) After conducting validity and reliability tests, the next test uses multiple linear regression to see the effect of the relationship between the independent factor and the dependent factor. This model is used to test the effect of two or more independent factors on one dependent factor. MLR assumes a straight line (linear) relationship between the dependent factor and each of its predictors (Heriyati, 2017). Based on the data that has been identified and grouped, then build an MLR model with the regression equation is as follows:

d)

Media has an effect on motivation

$$Y1 = \beta0 + \beta1X1 + \varepsilon \quad (1)$$

Media has an effect on experiences

$$Y2 = \beta0 + \beta1X1 + \beta2Y1 + \varepsilon \quad (2)$$

Media has an effect on Satisfaction

$$Y3 = \beta0 + \beta1X1 + \beta2Y1 + \beta3Y2 + \varepsilon \quad (3)$$

Description :
β1, β2, β3… βn = regression coefficient that shows the influence between factors
X1,X2,X3,….Xn = factor independen
Y1,Y2,Y3 = factor dependen
β0 = intercept (konstata regresi)
Ɛ = residual error term

e) The classical assumption test is used for the multiple linear regression model in describing the influence and relationship between factors to fulfil the requirements of the analysis, namely normality to ensure that the data is normally distributed, homoscedasticity to determine whether the residual variance remains constant, multicollinearity to determine whether there is no linear relationship, auto correlation to ensure that there is no auto correlation in the residuals.

f) Parameter tests include: F-test (stimulant test) tests the independent factors together to determine all the effects of independent factors on the dependent factor. F-test testing the significant level is 0.05, independent factors affect if the significant value (p-value) <0.05. T test (partial test) tests the estimated parameters of the regression model partially, namely the effect of factor X significantly on factor Y. Partial tests are carried out to see which factors have a significant effect on the model. If the value (p-value <0.05) then it shows a significant effect. The coefficient of determination (R-Square) test assesses the extent to which the model explains the variation in the dependent factor. The coefficient of determination test is carried out to measure the model's ability to explain how the influence of the independent factors simultaneously affects the dependent factor. The test results are seen from how much Adj.square and the coefficient of determination on R-square. The coefficient of determination is between 0 and 1, if the coefficient of determination is small, it shows that the ability of the independent factors to explain the dependent factor is very limited.

RESULT

Testing Validity dan Reability

After modelling the data with the multiple linear regression method, validity and reliability tests were used to ensure measurement quality. The validity test is carried out by looking at the correlation between the question item score and the total score using Pearson Product Moment. The statement is declared valid if the r-count> r-table value at the p-value <0.05 significance level, which means that the statement item is able to measure the intended construct. Furthermore, the reliability of the instrument was tested using the Cronbach's Alpha coefficient to see internal consistency. An α value ≥ 0.70 indicates good reliability, 0.60-0.70 is still acceptable although it is classified as sufficient, while values below 0.60 are considered unreliable (Sugiono et al., n.d.). With a valid and reliable instrument, it will produce consistent and precise data in describing the research factors. Validity testing output as in table 2

Table 2. Output Testing Validity

Factor	t.count	p-value
Media	0,350052	2.189435e-04
Material	0,343655	2.900059e-04
Motivation	0,545546	1.228504e-09

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Interaction	0,233375	1.555480e-02
Experience	0,578054	7.046525e-11
Satisfaction	0,530473	4.181696e09

The validity test results show that all indicators in the research instrument are declared valid, because each has a p-value <0.05. Media indicators (r = 0.350; p < 0.001), Material (r = 0.344; p < 0.001), Motivation (r = 0.546; p < 0.001), Interaction (r = 0.233; p = 0.016), Experience (r = 0.578; p < 0.001), and Satisfaction (r = 0.530; p < 0.001) all meet the validity criteria. From these results, it can be seen that the indicators with the highest correlation are Experience and Motivation, while the indicator with the lowest correlation is Interaction.The reliability test results resulted in a Cronbach's Alpha value = 0.698, which can be categorised as quite reliable, although it is still slightly below the ideal standard of high reliability.

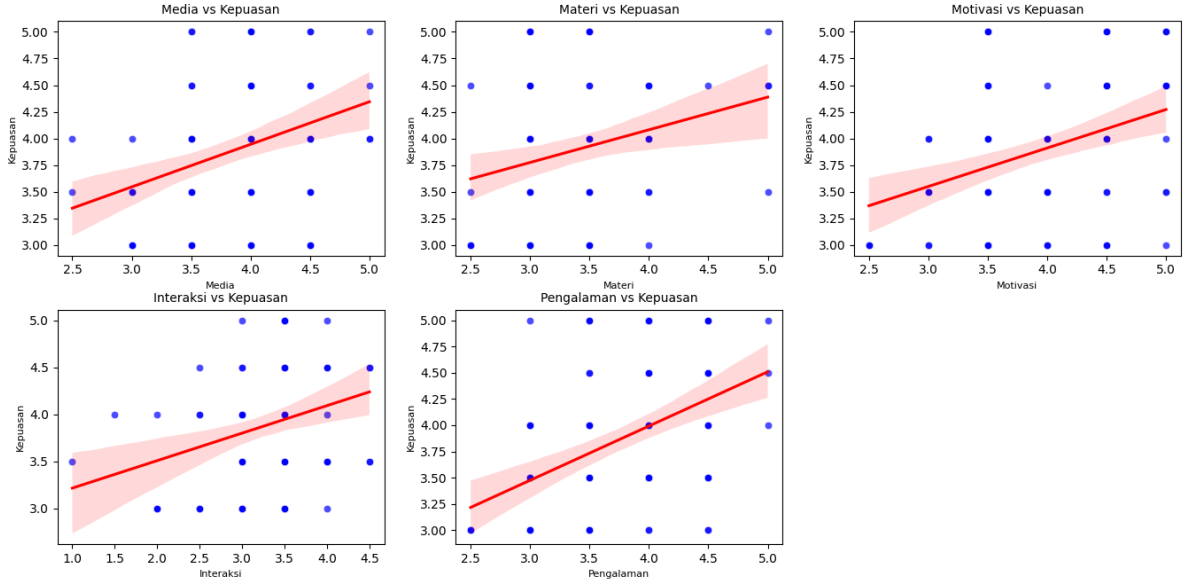

Fig 1. Graph of relationships factors

The scatterplot results show a consistent relationship between the independent variables and learning satisfaction. In the graph of media versus satisfaction, there is a fairly strong positive trend, so that the higher the quality of game-based learning media, the higher the students' learning satisfaction. A similar pattern can be seen in the graph of motivation versus satisfaction, where a clear positive relationship with a narrow confidence interval shows that motivation plays a significant role in increasing learning satisfaction. Meanwhile, the experience versus satisfaction graph also shows a stable positive trend, emphasizing the importance of enjoyable and meaningful learning experiences as predictors of satisfaction. Meanwhile, the material-satisfaction graph shows a positive relationship but with a wider data distribution and a wide confidence interval, so that although the direction of the relationship supports the hypothesis, the effect is not statistically significant. The same occurs in the interaction-satisfaction graph, where the relationship appears weak and the data points tend to be scattered, so that interaction does not contribute significantly to student satisfaction.

Multiple Linier Regression Analysis

The results of the data analysis were processed using the Python programming language and Microsoft Excel software with multiple linear regression methods to measure the significance of the relationship between independent factors and dependent factors. The results of the analysis are shown in Table 2

Table 3. Output model regression

	Coef	**Std err**	**t**	**P>|t|**
const	0,5918	0,484	1,223	0,224
Media	0,2594	0,091	2,838	0,005
Material	0,0072	0,098	0,073	0,942
Motivation	0,2840	0,084	3,401	0,001

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Interaction	0,0476	0,084	0,570	0,570
Experience	0,3239	0,113	2,872	0,005

Based on the results of the multiple linear regression equation model above, the coefficient value of all factors shows a positive value in influencing the experience in learning. From the results of the multiple linear regression model, the media, motivation, interaction and experience factors show a p-value smaller than 0.05, which means that they affect the experience in learning activities. While the material and interaction factors show a p-value greater than 0.05 which means they do not affect but have a positive coefficient value. Material and interaction factors are not significant, can be influenced by teaching materials so that they cause different perceptions from each student. As for these findings, it is concluded that the equation in the regression:

Motivation (Y1) = 0,5918 + 0,2594X1 (4)

Experience (Y2) = 0,5918 + 0,2594X1 + 0,2840Y1 (5)

Satisfaction (Y3) = 0,5918+ 0,2594X1 + 0,2840Y1 + 0,3239Y2 (6)

From the regression equation, it was found that the variables of motivation and experience had a significant effect on student satisfaction. The regression coefficient value for motivation was 0.2840 with a significance value of 0.001, indicating that every one-point increase in motivation would increase satisfaction by 0.284 points or approximately 5.7% on a Likert scale of 1–5. Meanwhile, the experience variable, with a coefficient of 0.3239 and a significance value of 0.005, contributes more significantly, where each one-point increase in experience will increase satisfaction by 0.324 points or about 6.5%.

Testing Asumtion Classic

Testing the normality of residuals is done through the Kologorov Smirnov statistical test with graphical visualisations such as the residual histogram and Q-Q plot. The histogram of residuals is used to look at the distribution of data, where the shape of the distribution that resembles a bell curve indicates that the residuals are close to a normal distribution. In addition, the Q-Q plot (Quantile-Quantile Plot) compares the residual distribution with the theoretical normal distribution. If the residual points are around the diagonal line without extreme deviations, it is concluded that the residuals are normally distributed. The test results show with a statistical value of 0.9855 and a p-value of 0.2983 (> 0.05) that the residual data is normally distributed with the assumption of normality fulfilled. Results as in Fig 2

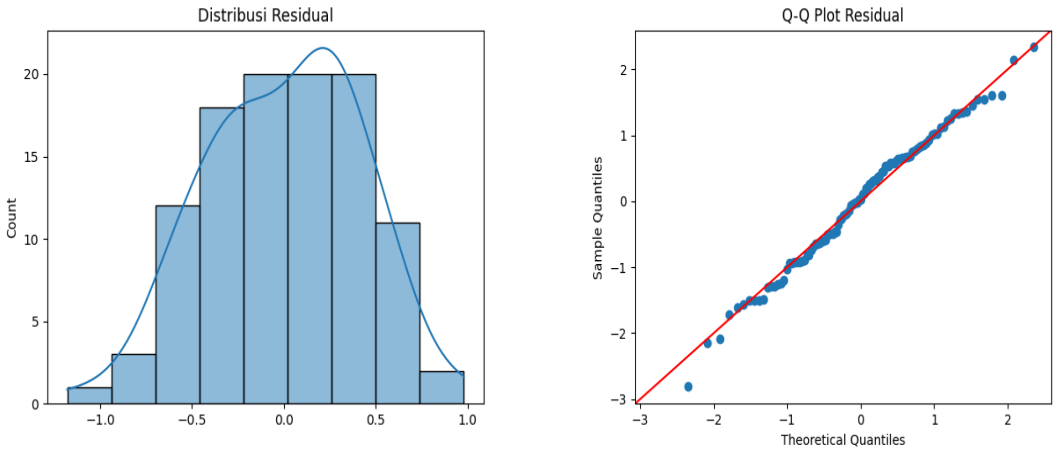

Fig 2. Output Testing Normality

Furthermore, the multicollinearity test shows that the media factor has a VIF value of 1,167, material 1,219, motivation 1,368, interaction 1,132, and satisfaction 1,319. All VIF values are far below the standard limit of 10, so there are no symptoms of multicollinearity between independent factors. This confirms that each independent factor stands independently in the regression model. The high VIF value on the constant (115.94) is not a problem because the constant is not used in the interpretation of multicollinearity.The F-test results show an F-statistic value of 14,317 with a p-value = 1.02e-11. Based on the test criteria, the model is declared significant if the p-value <0.05. Since the p-value is much smaller than 0.05, it can be concluded that simultaneously all independent

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factors (media, materials, motivation, interaction, and response) have a significant effect on the dependent factor. This, the regression model used is declared fit and feasible to explain the relationship between factors.
Then, the Breusch-Pagan heteroscedasticity test produces an LM Stat = 9.582 with a p-value = 0.088, and F-Stat = 1.987 with a p-value = 0.087. Based on the test standard, heteroscedasticity does not occur if the p-value > 0.05. Since the p-value obtained is greater than 0.05, it can be concluded that this regression model is free from heteroscedasticity problems. The autocorrelation test shows a Durbin-Watson value of 1,840. Based on testing standards, a DW value close to 2 indicates the absence of autocorrelation, while a value below 1 or above 3 indicates autocorrelation. Then, this model is free from autocorrelation problems. The F-statistic = 14.317 with p-value = 1.02e-11 also reinforces the overall significance of the model.

Testing Parameter

The F-test results show an F-statistic value of 14.317 with a p-value = 1.02e-11. Based on the test criteria, the model is declared significant if the p-value <0.05. Since the p-value is much smaller than 0.05, it can be concluded that simultaneously all independent factors (Media, Materials, Motivation, Interaction, and Response) have a significant effect on experience. Then, the regression model used is declared fit and feasible to explain the relationship between factors.
Partially, the t-test results show that there are three factors that have a significant effect on the dependent factor, namely Media (Coef = 0.259, p = 0.005 < 0.05), Motivation (Coef = 0.284, p = 0.001 < 0.05), and Satisfaction (Coef = 0.233, p = 0.005 < 0.05). Meanwhile, the other two factors, namely Material (Coef = 0.007, p = 0.942 > 0.05) and Interaction (Coef = 0.048, p = 0.570 > 0.05) have no significant effect on experience. Then, it can be concluded that the dominant factors influencing the learning experience in this study are learning media, student motivation, and student response.

Testing Coefisien Determination

The coefficient of determination test is carried out to measure the model's ability to explain how the influence of the predictor factors simultaneously affects the experience factor. The test results are seen from how much Adj.square and the coefficient of determination on R-square. The coefficient of determination is between 0 and 1, if the coefficient of determination is small, it shows that the ability of the independent factors to explain the dependent factor is very limited. See table .

Table 4. Coefisisen Regresion

R-square	Adj.square	f-statistic	Prob(f-stat)
0,462	0,430	14,317	1.02e-11

Based on the results in the coefficient of determination table, the Adjusted square value is 0.430 and the R-square value of 0.462 indicates that the variation in the dependent factor can be explained by the independent factor by 46%. The results show that there are other factors that are outside the model in predicting the experience factor.

DISCUSSION

The validity test results show that all research indicators, namely media, material, motivation, interaction, experience, and satisfaction, are valid because they have a p-value < 0.05. This indicates that each indicator is able to represent the measured construct well. However, the reliability test results with a Cronbach's Alpha value of 0.698 are still slightly below the ideal standard of ≥0.70. This condition is due to the consistency of responses between items in the instrument not being fully stable. This causes unwanted measurement variability, so that the interpretation of the relationship between variables has the potential to be inaccurate. Sufficient but not optimal reliability means that conclusions regarding the influence of media, motivation, and experience on learning satisfaction still require caution. In addition, weaknesses were also found in the instruments used to measure internal factors. Several indicators related to variables such as the learning environment, teacher support, and facility limitations were not adequately covered, so that the contribution of internal factors to the motivation, experience, and learning satisfaction of students was not fully described.

The regression results show that there are factors that are proven to be significant, namely Media (p = 0.005), Motivation (p = 0.001) and Experience (p = 0.005). These results show that the use of learning media plays an important role in creating learning experiences. Media that is varied and tailored to students' needs can increase attractiveness, engagement, and understanding of the material. Furthermore, the variables of material (p = 0.942) and interaction (p = 0.570) did not have a significant effect on learning satisfaction. There are several possible explanations for this condition. In terms of learning material, students are already familiar with the relatively standard material in accordance with the curriculum, so that variations in the presentation of material do not greatly affect their satisfaction. This means that satisfaction is determined more by how the material is delivered through interactive media than by the content of the material itself. Thus, although the material is important, it is not a

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dominant differentiating factor in influencing learning experiences and satisfaction. Second, for the interaction variable, although the direction of the relationship is positive, the effect is not significant. This is because quiz- and game-based learning emphasizes individual engagement through digital devices rather than direct interaction between students or with teachers. As a result, the level of interaction is not the main determinant of satisfaction, but rather the students' personal experience in using the media. This is in line with the view that students tend to feel more satisfied when learning media and methods are able to motivate them and provide an enjoyable learning experience, rather than just focusing on relatively uniform content (Saputra et al., 2024). Furthermore, motivation was the most dominant factor, in line with learning theory that emphasises the importance of psychological aspects in building interest and learning experience. Meanwhile, students' positive response to learning also proved significant, indicating that students' attitudes and perceptions towards the learning process have a real contribution to the learning experience.

In this context, game-based learning emphasizes interactive aspects based on digital media, so even though interaction between students and between students and teachers still occurs, its influence on learning satisfaction is not dominant. Thus, material and interaction can be considered supporting factors, while media, motivation, and experience are the main determinants of learning satisfaction. Additionally, the relatively low correlation value of interaction in the validity test ($r = 0.233$) also reinforces that this indicator is indeed less effective in representing the construct being measured. This finding indicates that the cognitive aspects of the material and the social aspects of the interaction need to be strengthened through more innovative learning methods, such as project-based or collaborative learning (Ranti & Irawan, 2024).

This research focuses on aspects of digital quiz game media as a tool in learning as a predictor factor that affects learning experience and satisfaction. The model data is tested using 3 methods, namely validity and reliability tests to test the statements in the questionnaire are valid, classical assumption tests (normality, multicollinearity, autocorrelation, heteroscedasticity) to determine the effect of the relationship of all factors. Furthermore, the significance test and the coefficient of determination to determine the influence between factors and describe the ability of the model to explain the factors studied. The Adjusted R-square value (0.430) shows that the model only explains about 43% of the variation, so there are still other factors that are more dominant outside the model. The material and interaction factors showed insignificance, which may be influenced by the limitations of the instrument design or the lack of variation in the learning methods observed. Suggestions for further development in further research can add external factors such as learning environment, family involvement so that the model has higher variation.Overall, the results of this study support the view that appropriate learning media, internal motivation and positive student responses are important factors in creating learning experiences, while materials and interactions require additional strategies to have a significant impact. This has practical implications for educators to focus more on developing media and motivational strategies, as well as creating a learning atmosphere that fosters positive student responses. This study shows that learning using quiz game media has a significant effect on the learning process activities of students. This is in line with research conducted by (Dainamang et al., 2024) In addition, the development of learning systems with quiz games provides meaningful experiences creating high enTheniasm, challenging and fun compared to other conventional methods (Lestari et al., 2023).

CONCLUSSION

Based on the analysis, the use of technology in learning activities through quiz games has been proven to affect student motivation, learning experience, and learning satisfaction. Quiz games can create more effective learning conditions, accommodate students who are slow to understand the material, stimulate enthusiasm for doing exercises, and allow students to adjust their learning speed according to their individual abilities. The results of parameter testing also show that the use of quiz game media can increase motivation while enriching learning experiences and creating learning satisfaction. Thus, learning strategies need to be designed not only to increase motivation but also to provide meaningful learning experiences so that the quality of learning in the classroom can be optimally achieved. This study provides a model of the relationship between game-based learning media and learning motivation and learning satisfaction in the environment of Bhinneka Karya Simo Vocational High School. This model shows that learning media can act as a primary stimulus that encourages increased motivation and is an important factor in fostering learning satisfaction. This research can also be used as a guide for teachers in designing game-based learning media.

Teachers need to pay attention to interactivity, question difficulty levels, and attractive visual designs so that the media can continuously stimulate student motivation. In addition, teachers can use quiz games not only as an evaluation tool, but also as a means of active learning that encourages students' full involvement, thereby creating a fun and meaningful learning atmosphere. For further research, improvements to the instrument are needed through the development of more representative questions, scale testing with a larger sample, and evaluation of weak items through item-total correlation analysis. Furthermore, the research model can be developed using the Structural Equation Modeling (SEM) approach with path analysis to gain a deeper understanding of the direction

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and strength of the relationships between factors, while also taking into account the role of external variables more comprehensively.

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