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The Effect Of Quizizz as an Interactive Media on Students' Learning Outcomes in Thermochemistry Material

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Abstract

Research has been conducted on the effect of quizizz as an interactive media on the learning outcomes of students of SMAN 6 Kendari on thermochemical materials. This study aims to determine how much influence quizizz has on student learning outcomes in class XI SMAN 6 Kendari. The research method used was Quasy Experiment with non-equivalent control group design technique. Data collection techniques through tests and observations. The test used is only posttest which is presented as data on student learning outcomes. The samples used were Applied XI class 1 as a control class using conventional learning media and Applied XI class 4 as an experimental class using quizizz learning media. Data processing techniques were carried out with descriptive statistical tests and inferential statistical tests with the T test hypothesis test (Independent sample T-test) assisted by IBM SPSS Statistics 25 software. Based on the results of the study, it shows that there is a significant effect on quizizz learning media on student learning outcomes. This is proven by using the T test with a sig value. (2-tailed) 0.026 <0.05. From the results of this study it can be concluded that quizizz learning media has an effect on student learning outcomes.
Keywords: Quizizz Learning Media, Student Learning Outcome, Thermochemistry.

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Introduction

The Industrial Revolution 4.0 has significantly influenced the development of information and communication technology (ICT). This has had an impact on various fields, one of which is education (Takdir, 2017). The benefits of ICT media have been increasingly felt since the Covid-19 pandemic. To suppress the spread of the virus, all activities are carried out at home, which has had a significant impact on various political, social, economic, and educational sectors. However, this ICT media presents a challenge for all parties, including teachers, parents, and students. They must be prepared to navigate a new life through a learning approach using ICT and electronic media so that the teaching process can continue smoothly into the future.(Wardah & Arifin, 2023).

In an effort to restore and improve the quality of education, the Ministry of Education and Culture (Kemendikbud) has made changes to the curriculum, including simplifying and refining it to adapt to current conditions, systems, and learning styles, thus reducing the burden on students. In this regard, the Ministry of Education and Culture has proposed a new policy, the Independent Curriculum (Puskur Dikbud Ristek, 2021). The Independent Curriculum offers a variety of intracurricular learning experiences, optimizing the available content so that students have sufficient time to deepen and understand competencies (Kemendikbud, 2022). Teachers are free to independently choose teaching materials according to their students' interests and learning needs.(Barlian & Solekah, 2022). The teaching tools in question are in the form of teaching materials (Prianti, 2022).

Based on observations at SMA Negeri 6 Kendari, the school has implemented the independent curriculum since 2022. One of the chemistry topics taught at the school is thermochemistry.

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Thermochemistry is the study of the law of conservation of energy, exothermic and endothermic reactions, enthalpy and its changes, and the heat of combustion in everyday life. Interviews with chemistry teachers at SMA Negeri 6 Kendari revealed that the use of Problem Based Learning (PBL) and Discovery Learning models with lecture and discussion methods using learning media in the form of PowerPoint or alternative media such as markers and whiteboards for thermochemistry material has not been able to improve student motivation and learning outcomes. This is evidenced by the average student score in thermochemistry learning in the previous academic year, which was 56.6, which did not meet the Minimum Completion Criteria (KKM). One of the causes of low student learning outcomes is because thermochemistry material is an abstract subject and requires understanding at various levels of representation: macroscopic, submacroscopic, and symbolic. This causes students to often experience misconceptions (Setyorini, et al., 2018).

This lack of understanding leads to a low level of student interest in learning. Students prefer to use their smartphones for entertainment, such as browsing social media or playing games during the learning process. This is supported by research (Pratiwi, 2022), which states that students at SMA Negeri 6 Kendari prefer playing online games and social media during chemistry lessons. This behavior is inappropriate and inconsistent with the independent learning curriculum used at the school. To encourage students to utilize their smartphones more effectively in their learning, interactive learning media using smartphones is necessary.

Interesting learning media must be interactive and fun, and encourage interaction between students to create motivation in learning. One interactive learning media is the Quizizz application (Irwan et al., 2019). Quizizz is a game-based educational application that brings multiplayer activities into the classroom and makes it an interactive and fun practice class (Purba, 2019). The use of Quizizz has a positive impact on teachers and students. Teachers are facilitated by the use of Quizizz in delivering learning materials, conditioning students in the classroom, and can improve student learning outcomes. For students, Quizizz is considered an interesting learning media, because it provides a new atmosphere and makes it easier for students to understand the learning material (Mulyati & Evendi, 2020). Quizizz has three main features: lesson features, interactive videos, and quizzes. The lesson feature has different advantages from other interactive media because the lesson feature is equipped with text, images, sound and video to create teaching materials and can be combined with providing feedback in the form of quizzes in the material slides in the form of multiple choice, polls, short answers, open questions, and drawing.(Azzahra & Pramudiani, 2022). By implementing the Quizizz game, students can practice in class on their electronic devices. Unlike other educational apps, the Quizizz game features game-like features such as avatars, themes, memes, and entertaining music to enhance the learning process. Quizizz also allows students to compete with each other and motivates them to learn (Wardah & Arifin, 2023).

From seeing the results of previous research on the use of Quizizz learning media using lesson and quiz features that had a positive effect, a similar study was planned with previous researchers in the use of Quizizz media as an interactive media for learning. However, there is a difference in the research that will be carried out with previous researchers, namely that no one has provided a lesson feature in Quizizz in chemistry learning on thermochemistry material so that researchers are interested in using Quizizz learning media which aims to determine the effect of Quizizz as an interactive media on the learning outcomes of class XI students of SMAN 6 Kendari on thermochemistry material.

Methodology

This research was conducted at SMAN 6 Kendari in the even semester of the 2023/2024 academic year in class XI with a population of 203 students and a sample of 60 students was taken. A total of 2 groups, namely class XI Applied 1 as the control class and class XI Applied 4 as the experimental class. This research was conducted to determine the effect of Quizizz as an interactive media on student learning outcomes in thermochemistry material. Each class was given a test at the end of the learning process (posttest) that is after the treatment was completed. The form of the test questions given was in the form of multiple choice questions covering thermochemistry material. Posttest data will be further analyzed regarding the relationship between a treatment and student learning outcomes. The research design is in the form of a Post-test Only Control Design. The research design is depicted in Table 1 as follows:

DOI:

Table 1. Research Design

Group	Treatment	Post Test
Experiment	X1	O1
Control	X2	O2

The variables in this study consist of two independent variables, namely learning with the Problem Based Learning model with Quizizz media or X1 and learning with the Problem Based Learning model with conventional media or X2, while the dependent variable is student learning outcomes.

Method of collecting data

Observation

The observation method was implemented to identify and identify existing problems at the research location and thus enable solutions. The observation method employed involved direct observation of the learning process.chemistry class XI at SMA Negeri 6 Kendari.

Test

The test consisted of 20 multiple-choice questions, validated by experts. The test was administered once in both the experimental and control classes after receiving the interactive learning media Quizizz. The data collected were students' post-test results.

Data Analysis Techniques

Descriptive Statistical Analysis

Descriptive statistical analysis determines the average student learning outcomes, the number of students who completed the class, and the standard deviation.

Inferential Statistical Analysis

a. Homogeneity Test

The homogeneity test is used to prove that two or more sample groups come from populations that have the same variance. In this study, a homogeneity test was conducted using the Levene Statistic method using the SPSS 25 program. The decision criteria for the homogeneity test are if the significance number is > 0.05 for both types of groups, similar (homogeneous), if the significance number is < 0.05 both types of groups are not similar (not homogeneous).

b. Hypothesis Testing

The t-test method, independent sample t-test. This test is used to compare the means of two unrelated groups. This test is used to test for significant differences in certain values from the sample means. The calculation above was performed using the SPSS 25 program to manage the data. The t-test was chosen because the data obtained were from two different classes. The t-test can be interpreted as a significance criterion > 0.05, indicating no significant effect, while a significance value < 0.05 indicates a significant effect.

Results and Discussion

The posttest results data for the experimental and control classes are presented in Table 2 as follows.

Table 2. Posttest Results Data for Experimental Class and Control Class

Data	Experimental Class	Control Class
	Posttest	*Posttest*
Maximum value	95	85
Minimum value	50	40
Average	74.67	68
Students complete	17	10
Number of students	30	30
Standard Deviation	11.67	10.95

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Based on Table 2, the posttest results data obtained from the descriptive test results using the SPSS 25 application can be seen that in the experimental class, 30 students obtained the lowest score of 50 and the highest score of 95 with an average of 74.67. Meanwhile, in the control class, 30 students obtained the lowest score of 40 and the highest score of 85 with an average of 68. This shows that the average score of the experimental class is 6.67 points higher than the control class. The standard deviation of the experimental class is 11.67 while the control class has a smaller standard deviation of 10.95. This shows that the distribution of student scores in the experimental class is more varied than the control class.

Normality Test

The normality test conducted in this study used the Shapiro-Wilk test with a significance level of 5%. To measure the data in this study, the following criteria were used: if the data is normally distributed, its significance value exceeds the specified alpha level (0.05). Conversely, if the significance value is less than 0.05, the data is not normally distributed. Table 3 presents the following:

Table 3. Normality Test Data

Data Types	Learning methods	Shapiro-Wilka Sig.	Information
Student Learning Outcomes	Experiment Posttest	0.262	Normal
	Posttest Control	0.117	Normal

The results of the normality test analysis using the Shapiro-Wilka test above show a significance value > 0.05. For the experimental class, the posttest results obtained a significance value of 0.262. Meanwhile, the control class' posttest results obtained a significance value of 0.117. Based on the table above, the results of the normality test data analysis can be said to be normally distributed.

Homogeneity Test

Homogeneity test was conducted using Levene Statistic method using SPSS 25 program in this study. With the decision criteria of both groups are similar (homogeneous) that is if the significance number on Based on Mean <0.05 means that the two types of groups are not homogeneous and if the significance number Based on Mean> 0.05 means that the two types of population groups are similar (homogeneous). Below is presented in table 3 as follows;

Table 4. Datahomogeneity test

Data source	Levene Statistics	Df1	Df2	Sig.	Information
Student Learning Outcomes	.023	1	58	.881	Homogeneous

The homogeneity test results in Table 4 show that the data for both groups are homogeneous. This is evident from the significance value, which is greater than the decision criterion of 0.05.

T Test (Independent Sample T-Test)

This test aims to compare the learning outcomes of students who implemented Quizizz learning media with those who did not. The Independent Sample T-Test (T-Test) was used in this study. A t-test is interpreted as a significance level >0.05, indicating no significant effect. A significance level <0.05 indicates a significant effect. Table 5 presents the following:

Table 5. DataT-Test Results

Class	**Sig. (2-tailed)**	**Significance Level**	**Interpretation**

DOI:

Control Experiment	0.026	5% (0.05)	There is a significant influence

The results of the independent samples t-test analysis above indicate a significant difference. This is evident in the 2-tailed sig. value of 0.026 < 0.05, indicating a significant difference between classes that implemented and those that did not implement Quizizz learning media.

Discussion

The research conducted by researchers at SMAN 6 Kendari aimed to examine the results of students' learning descriptions and to determine whether the use of Quizizz learning media had an impact on student learning outcomes. In the experimental class (Applied Grade XI 4), the learning model was applied.*Problem Based Learning*(PBL) using Quizizz learning media. Meanwhile, the control class (Applied XI 1) implemented the PBL learning model using conventional media.

Description of Student Learning Outcomes

This research is based on the problem of low student learning motivation in schools, especially starting from the impact of Covid-19 which changes learning towards the digitalization era so that students are allowed to bring smartphones to school. In addition to having a positive impact that makes it easier for students to find learning materials, there is a negative impact that most students are more interested in using smartphones to play online games which has an impact on the lack of student learning motivation which makes student learning outcomes low. In terms of efforts to improve student learning outcomes by utilizing smartphones as a learning media facility, researchers implemented PBL model learning without using Quizizz media (control class) and using Quizizz media (experimental class). Based on the posttest results, the maximum score of the experimental class was higher, namely 95 with a minimum score of 50, an average score of 74.67, as many as 17 students completed out of 30 students. compared to the control class with a maximum score of 85 with a score of 40, an average score of 68, as many as 10 students completed out of 30 students.

Based on the explanation above regarding student learning outcomes in the experimental class, there are still 13 students who have not completed the task. This is influenced by several factors, such as the level of basic understanding of student calculations which is still lacking because thermochemistry material is abstract material and requires in-depth understanding and requires calculations in chemical reactions. This is in line with research by Kurnia, et al., (2020) who stated that students who have difficulty answering thermochemistry questions are because they are not used to encountering such questions so that students need many concepts and good analysis in solving the problems. In addition, the factor of low student learning outcomes is influenced by low student learning motivation, namely during the learning process there are still students who do not pay attention to the teacher.

The Influence of Quizizz as a Learning Medium on Student Learning Outcomes

Quizizz is an application that can be used as a learning tool for creating interactive presentations and quizzes in education. This application can be accessed via smartphones, which most people already own. This makes it easier for students to continuously learn while playing using Quizizz, without the constraints of time and place (Ramadhani et al., 2020). Using the Quizizz application is very helpful in providing a wealth of practice questions with a fun method, especially for learning that involves calculations, such as thermochemistry.

From the research results, based on the independent Samples T-Test 0.026 < 0.05, it means that H0 is rejected so that there is a significant difference in learning outcomes between students in the experimental class and students in the control class. The existence of this difference can be ascertained that the use of Quizizz can improve student learning outcomes because it is easy to use without requiring high technological skills. This is supported by Ardila & Ajat (2023) who stated that the Quizizz application in science subjects is proven to be able to improve student learning outcomes by 80% with a very high percentage level of improvement in learning outcomes.

The improvement in student learning outcomes is also due to the application's attractive appearance, the use of background music that increases students' enthusiasm for working on the questions, and its ease of access. Quizizz's appearance, which features player characteristics such as avatars, themes, memes, and music, provides a pleasant experience during the learning process. This is supported by Lestari et al. (2023), who stated that using the Quizizz application, developed in an

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attractive manner, can increase students' enthusiasm for working on questions, allowing them to complete them easily and thoroughly

Conclusion

Based on the results of the research and the description of the discussion, it can be concluded that the description of student learning outcomes using the Quizizz application media based on the posttest shows a higher maximum value of the experimental class, namely 95 and a minimum value of 50, an average gain of 74.67, as many as 17 students completed out of 30 students and those using conventional media. based on the posttest shows a maximum value of 85 with a value of 40, an average gain of 68, as many as 10 students completed out of 30 students. Then, there is a significant difference in understanding of thermochemistry material in the experimental class using Quizizz media compared to the control class using conventional media. This is indicated by the results of the independent Samples T-Test of 0.026 <0.05 meaning that H0 is rejected so that there is a significant difference in learning outcomes between experimental class students and control class students.

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