

The Effect of the Use of Quizlet Evaluation Media on the Computational Thinking Ability of Class X Students at SMAN 1 Rambah

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A B S T R A K

This study examines the impact of using Quizlet as an evaluation tool on students' computational thinking abilities at SMAN 1 Rambah. A quantitative method with a one-group pretest-posttest design was employed, involving 36 students from class X-A selected through purposive sampling. Data were collected using computational thinking tests administered before and after the intervention. The results showed a notable increase in students' average scores, from 64.58 in the pre-test to 78.33 in the post-test. A paired sample t-test confirmed a statistically significant difference with a p -value of $0.000 < 0.05$, indicating that Quizlet significantly enhances students' skills in decomposition, pattern recognition, abstraction, and algorithm design. These findings highlight Quizlet's potential not only as a language learning platform but also as an effective medium for developing computational thinking in secondary education.

Keywords: *Quizlet, Computational Thinking, Digital Literacy, Learning Media, Student Evaluation*

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INTRODUCTION

The massive development of information and communication technology in the era of the Fourth Industrial Revolution has drastically changed the educational landscape, driving the emergence of innovative digital and mobile technology-based learning concepts (Todorova, 2023). The use of handheld digital devices in this contemporary teaching method provides educators and students with unique possibilities to interact directly, access information widely, and learn independently and sustainably (Nguyen & Le, 2023). In this context, digital literacy is an important skill, especially in supporting the online learning process and vocabulary mastery (Tiang-uan, 2023).

One of the essential skills that learners must have in the 21st century is Computational Thinking (CT). CT is a systematic thinking approach to solving problems that can be expressed in the form of algorithms and computational solutions, and includes decomposition, pattern recognition, abstraction, and algorithm design skills (Sitorus et al., 2024). According to Wing (2006), computational thinking skills are not only important in computer science, but also crucial for all individuals in understanding and responding to the challenges of the complex and dynamic digital world. CT helps learners build the critical and creative thinking skills needed to solve real problems efficiently, as well as support data-driven decision-making (Tang et al., 2020). Therefore, the integration of CT in the learning process is very important to prepare students to become adaptive and solutive individuals in the digital era (Nasiba, 2022).

Along with the development of educational technology, digital platforms like **Quizlet** have been widely used in the world of education. Quizlet is an online learning platform that provides interactive flashcard features, game-based activities, and engaging formative evaluations (Kholis & Nadhif, 2023). A number of studies have shown that the use of Quizlet has a positive impact on students' learning motivation, vocabulary mastery, and learning

outcomes (Yılmaz & Yaşar, 2023; Çaparlar & Yünkül, 2024). Systematic use of Quizlet has also been shown to improve retention, learning time efficiency, and learning accessibility in various situations (Özdemir et al., 2024).

Seeing the potential of Quizlet, which has been widely used in vocabulary development, this study aims to investigate the influence of the use of Quizlet evaluation media on the computational thinking ability of grade X students at SMAN 1 Rambah. The focus of this research is to examine the extent to which the integration of Quizlet in the evaluation process can support the development of computational thinking skills such as decomposition, pattern recognition, abstraction, and algorithms. Thus, this research is expected to make a new contribution to the use of learning technology as a tool that not only supports mastery of subject matter, but also strengthens the essential cognitive skills that students need to succeed in the digital era. Based on this background, the formulation of the problem in this study is: Does the use of Quizlet evaluation media affect the computational thinking ability of grade X students at SMAN 1 Rambah?

METHOD

This study uses a quantitative approach with a one group pretest–posttest design. This design involves a group of subjects who are treated, and measurements are taken before and after the treatment (posttest). The advantage of this design is that it allows researchers to measure the changes that occur as a result of the treatment directly in the same group. However, the disadvantage is the absence of a control group, making it difficult to eliminate the influence of external variables that might affect the outcome (Creswell, 2014).

The population in this study is all class X students at SMAN 1 Rambah which totals 144 people. The sampling technique was carried out by purposive sampling, by selecting one class (X-A) consisting of 36 students. The criteria for selecting the sample include: students have a personal digital device (such as a mobile phone/laptop), as well as stable access to the internet during the learning process.

The main instrument in this study is the test of computational thinking ability (Computational Thinking) which is compiled based on CT indicators: decomposition, pattern recognition, abstraction, and algorithms (F. Nuraini, N. Agustiani, & Y. Mulyanti, 2023). This instrument has been validated by experts in the field of education, technology and informatics to ensure content validity. Validity is tested using the item's validity coefficient with Pearson's correlation, and reliability is tested using Cronbach's Alpha formula. The results of the reliability test showed an alpha value of ≥ 0.70 , which indicates that the instrument is classified as reliable (T. Angelina & L. Qurrotaini, 2024).

This research was carried out in several stages. In the first week, students are given a pre-test to find out the initial ability in computational thinking. In the second to fourth weeks, students follow the learning process with the use of Quizlet as an evaluation medium. Quizlet is used regularly in learning activities with features such as *Flashcards*, *Learn*, *Match*, and *Test*, which have previously been shown to be effective in improving information retention and student engagement (Nguyen & Le, 2023). After the treatment period, students work on a post-test to evaluate the development of their computational thinking skills.

The data obtained from the pre-test and post-test results will be analyzed using the help of SPSS statistical software. The main analysis technique is a paired sample t-test to find out the difference in scores before and after treatment. Before the t-test is carried out, a normality test will be carried out using Kolmogorov–Smirnov or Shapiro–Wilk, depending on the sample size. If the data is distributed normally, then a parametric t-test is used. If the data is abnormal, then an alternative non-parametric test such as the Wilcoxon signed-rank test is used. The t-test formula used is as follows:

$$t = \frac{\bar{d} - (sd/n)}{t} = \frac{\bar{d} - (s_d / \sqrt{n})}{t} = (sd/n) \bar{d}$$

where:

\bar{d} = the average difference between pre-test and post-test scores,

s_d = the standard deviation of the difference,

n = number of samples.

The significance level used in this study was $\alpha = 0.05$, with the decision making criteria: if the p -value < 0.05 then there was a significant difference between pre-test and post-test.

FINDINGS AND DISCUSSION

Findings

The results of this study are presented based on the analysis of pre-test and post-test data on the computational thinking ability of students in class X-A SMAN 1 Rambah after being treated in the form of the use of Quizlet evaluation media in learning. The data collected included pre-test scores as a representation of students' initial abilities, and post-test scores as a post-intervention picture. The analysis was carried out in two stages, namely descriptive analysis and inferential analysis.

Descriptive Analysis

Table 1. Descriptive Statistics of Pre-test and Post-test Scores

Test Type	N	Min	Max	Mean	Std. Deviation
Pre-test	36	45	85	64,58	9,59
Post-test	36	60	95	78,33	10,35

From Table 1, it can be seen that the pre-test score has a minimum value of 45 and a maximum of 85 with a mean of 64.58 and a standard deviation of 9.59. This standard deviation value indicates that there is a moderate spread of the score from the mean; Most students have early computational thinking skills at the intermediate level, but there are few students who have lower and higher abilities.

In the post-test results, the minimum score increased to 60 and the maximum reached 95. The average score rose to 78.33, while the standard deviation became 10.35. This shows that in addition to the average increase, there is also a slight increase in the variation in student scores. This means that some students show very high improvements, while others experience moderate improvements.

The distribution of data on both tests showed a normal trend, with no dominant extreme or outlier values. The higher difference in the minimum and maximum at the post-test showed a significant increase in individual achievement after treatment.

Normality Test

Before the inferential analysis is carried out, a normality test is carried out to determine the right type of statistical test. The test was performed using Kolmogorov-Smirnov and Shapiro-Wilk, which are recommended for small sample sizes ($n < 50$).

Table 2. Pre-test and Post-test Normality Test

Test Type	Kolmogorov-Smirnov Sig.	Shapiro-Wilk Sig.
Pre-test	0,141	0,447
Post-test	0,158	0,104

The significance value of both test methods showed results above 0.05, both for pre-test and post-test. Thus, the data is declared to be normally distributed, and further analysis can use a parametric test, i.e. a paired sample t-test.

Uji Paired Sample t-Test

Tabel 3. Paired Sample t-Test Pre-test vs Post-test

Mean Difference	Hours of deviation	Std. Error Mean	t	df	Sig. (2-tailed)
13,75	8,73	1,46	9,45	35	0,000

The results of the paired sample t-test showed that there was an average score difference between post-test and pre-test of 13.75 points. A t-value of 9.448 with a significance of 0.000 (< 0.05) indicates that the difference is statistically significant. The 95% confidence interval for the mean difference was in the range of 10.79 to 16.70, which was entirely positive, indicating that the treatment had a significant effect on improving students' computational thinking skills.

Discussion

The results of the analysis show that the systematic and structured use of Quizlet in the learning evaluation process has a positive impact on improving students' computational thinking skills. A higher average post-test score reflects an improvement in important aspects of Computational Thinking, such as problem decomposition, pattern recognition, abstraction, and algorithm design.

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Features in Quizlet such as Flashcards, Match, and Test are not only engaging, but they also help students develop logic, break down problems into simpler steps, and understand algorithmic thinking structures. This is in line with the findings of Atalan & Subasi (2023) that interactive digital-based learning can improve students' high-level thinking skills.

In addition, Quizlet's accessibility via mobile devices and the flexibility of study times allow students to repeat material independently, outside of lesson hours. This situation supports the self-sustaining, sustainable learning approach that is so much needed in 21st century learning.

Overall, the study shows that Quizlet is not only effective for vocabulary mastery, as shown in many previous studies, but is also relevant for the development of logic skills and systematic thinking. Therefore, teachers are encouraged to utilize digital evaluation media such as Quizlet as part of a learning strategy based on computational thinking skills.

CONCLUSION

Based on the results of data analysis and discussions that have been carried out, it can be concluded that the use of Quizlet evaluation media has a significant effect on improving the computational thinking skills of grade X students at SMAN 1 Rambah. This is shown by the increase in the average score from pre-test to post-test as well as the results of the paired sample t-test which showed a significant difference in the 95% confidence level. Quizlet media has been proven to facilitate the development of computational thinking skills that include decomposition, pattern recognition, abstraction, and algorithm design. Interactive features such as flashcards, matches, and tests in Quizlet are not only engaging, but also accessible and allow students to learn independently, flexibly, and continuously outside of the classroom. The practical implication of this research is that teachers and educational institutions can consider the integration of digital media such as Quizlet as part of learning evaluation strategies, especially in 21st century skills development. This media provides a more interesting and responsive evaluation alternative to the learning needs of the digital generation. The academic implications of this study suggest that the use of digital-based educational technologies can be a relevant topic for further research, particularly in the context of developing high-level cognitive abilities. This research can also be the basis for further studies on the effectiveness of various online learning platforms in improving various domains of students' thinking skills.

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