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IMPROVING READING COMPREHENSION USE QUIZIZZ APPLICATION AND COGNITIVE STYLE

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ABSTRACT

This study explores the impact of the Quizizz application and visualizer-verbalizer cognitive styles on students' reading comprehension. The research aims to determine whether interactive learning tools like Quizizz can improve students' reading comprehension by considering their cognitive preferences. The issues addressed in this study include (1) students perceiving English as a challenging subject, (2) weak reading comprehension skills in descriptive texts, (3) limited mastery of English grammar, (4) disengagement with conventional teaching methods, and (5) the need for interactive tools to boost engagement and comprehension. The study specifically examines the influence of the Quizizz application and cognitive styles on the reading comprehension of seventh-grade students. Employing a 2 x 2 factorial design, the research focuses on two independent variables: the use of Quizizz and cognitive styles (visualizer vs. verbalizer). The findings reveal that the Quizizz application significantly enhances students' reading comprehension. Furthermore, the interaction between the Quizizz application and cognitive styles suggests that personalized digital tools can improve student engagement and comprehension, offering valuable insights for future English language teaching strategies.

Keywords: Quizizz Application, Cognitive Style, Reading Comprehension.

1. INTRODUCTION

The ability to understand written text is crucial for academic achievement, particularly in language learning settings. Reading comprehension extends beyond merely recognizing words; it involves higher-order cognitive processes such as analyzing, synthesizing, and evaluating information (Banditvilai, 2020; Baleghizadeh & Maryam, 2019). According to Rojabi (2021), comprehension depends on the interplay between linguistic knowledge, working memory, and inferential reasoning. Likewise, Mariana et al. (2020) stressed that comprehension goes beyond grasping the literal meaning, requiring students to establish connections, draw inferences, and interpret meanings within a given context. In the case of descriptive texts, students often struggle because they must visualize and contextualize information about a subject, making comprehension more complex and necessitating targeted instructional strategies.

One instructional approach increasingly used to enhance reading comprehension is Quizizz, a gamified application that fosters an engaging learning experience. Ketelhut & Schifter (2011) noted that incorporating game-based elements such as rewards, leaderboards, and instant feedback in education can boost motivation and improve learning outcomes. This aligns with the findings of Downie & Proulx (2022), who suggested that gamified assessments not only enhance engagement but can also deepen comprehension by requiring students to interact actively with the material. Melvina et al. (2021)

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further argued that platforms like Quizizz provide an ideal balance of challenge and support, enabling students to review content at their own pace while receiving immediate feedback on their understanding, which can help in strengthening reading skills over time. Despite the advantages of gamified learning, the effectiveness of such tools varies depending on students' individual differences, particularly their cognitive styles. Cognitive style refer to an individual's habitual mode of processing information, influencing how they interpret, store, and retrieve information. According to Purnomo et al. (2024), cognitive styles are critical in education because they shape students' preferences for processing information. One widely studied dimension of cognitive style is the visualizer-verbalizer cognitive style. Visualizers prefer pictorial or spatial representations, while verbalizers favor text-based or linguistic explanations. Fadilah et al. (2023) suggested that aligning instructional materials with these preferences can optimize learning, as visualizers benefit more from diagrams and images, whereas verbalizers achieve better comprehension through text-based information.

Considering students' cognitive styles in reading comprehension can significantly influence learning outcomes. Clark & Mayer (2023), in his study on multimedia learning, found that aligning teaching methods with students' cognitive preferences enhances both comprehension and retention. For instance, visualizers tend to benefit more from information presented with graphics or illustrations, which support mental visualization a key aspect of understanding descriptive texts. On the other hand, verbalizers perform better when content is delivered in a sequential, text-based format that facilitates verbal processing. Chen et al. (2020) further emphasized that differentiated instruction incorporating both visual and verbal cues can be highly effective in diverse classrooms, enabling students with varying cognitive preferences to engage with and comprehend material more effectively.

Cognitive styles play a crucial role in the implementation of the Merdeka Curriculum at SMPN 28 Palembang, which promotes personalized and adaptable learning. This curriculum encourages educators to acknowledge students' unique cognitive styles and modify instructional strategies to accommodate different learning preferences. Research by Aji (2023) on Indonesia's curriculum reform highlights the importance of addressing individual learning needs, demonstrating that students achieve better outcomes when teaching methods align with their cognitive styles. Similarly, Wiwin et al. (2022) argued that gamified learning platforms like Quizizz, when integrated with cognitive style considerations, can significantly enhance reading comprehension by catering to diverse learning preferences.

Moreover, recent studies suggest that addressing cognitive styles in classroom instruction can improve students' comprehension of descriptive texts. Widyastuti and Sumarno (2020) found that visual aids such as pictures and diagrams help visualizers connect with descriptive content, while detailed textual explanations are more beneficial for verbalizers. Arif (2023) further noted that a balanced combination of visual and verbal instructional methods enhances reading performance, as students are more likely to engage with and retain information that aligns with their cognitive processing style.

Based on these insights, this study explores the impact of the Quizizz application and visualizer-verbalizer cognitive styles on the reading comprehension of seventh-grade students at SMPN 28 Palembang. By analyzing these factors within the framework of the Merdeka Curriculum, the research aims to determine how digital learning tools and cognitive styles can be leveraged to enhance reading comprehension. Ultimately, the findings will provide educators with valuable strategies for meeting the diverse learning needs of their students.

2. LITERATURE REVIEW

Reading Comprehension

Reading comprehension is a complex cognitive skill that involves more than just recognizing words; it requires extracting meaning, understanding vocabulary, and making connections between ideas (Tahrun

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et al., 2017). This process engages higher-order thinking skills such as analysis, synthesis, and evaluation, allowing readers to interpret and internalize information effectively.

Takaloo and Ahmadi (2017) emphasized that comprehension involves not only identifying vocabulary but also linking words to form coherent ideas, requiring an understanding of language nuances, context, and syntax. Similarly, Meniado (2016) highlighted its importance in higher education, as academic success depends on students' ability to interpret and engage with texts. Since reading is fundamental for learning, developing strong comprehension skills is crucial for acquiring knowledge and future career success (Saeed & Gull, 2023; Kit et al., 2024).

Moreover, Brown (as cited in Melani et al., 2024) noted that reading comprehension is essential for learning, communication, and critical engagement with information. It enhances cognitive abilities, decision-making, and problem-solving skills, making it a valuable asset both academically and in everyday life.

Cognitive Style

Cognitive style refers to the consistent ways individuals perceive, process, and organize information, shaping how they approach tasks and solve problems. Pashler et al. (2021) defined it as a stable pattern of information processing, emphasizing habitual thinking rather than cognitive capacity. Similarly, Jonassen and Grabowski (2020) highlighted that cognitive style influences learning and problem-solving strategies across different contexts. Keefe (2022) further described it as a key factor in decision-making and adaptability, while Sternberg (2021) noted that cognitive style is flexible and can evolve with varied learning experiences.

Cognitive styles are categorized in several ways, with one key distinction being between field-dependent and field-independent learners. Kagan (2020) explained that field-dependent individuals rely on external cues and contextual information, while field-independent learners focus on details and analyze information systematically. Another major classification differentiates visualizers from verbalizers. Visualizers process information more effectively through images, diagrams, and spatial layouts, whereas verbalizers prefer text and spoken explanations (D'Mello & Graesser, 2019; Mayer et al., 2020; Kress & Leeuwen, 2020).

This study focuses on the visualizer-verbalizer dichotomy to examine its effects on students' reading comprehension. Visualizers benefit from visual aids like charts and diagrams, while verbalizers excel in text-based learning environments. By categorizing students based on these cognitive styles, the research aims to assess their impact on reading comprehension and inform instructional strategies that enhance learning outcomes.

Quizizz Application

Quizizz is an application-based quiz game designed to enhance learning through an interactive and engaging platform (Widya Ningrum, 2022; Afifah & Hasanudin, 2023). It provides a unique experience where students answer questions in a user-friendly interface with added time constraints to increase challenge and motivation.

Primastuti (2022) described Quizizz as a digital tool for assessment that integrates game-based elements such as avatars, memes, themes, and music, making learning more enjoyable. Teachers can track students' real-time performance and receive detailed reports for evaluation. Similarly, Reski et al. (2018) noted that Quizizz fosters collaboration, allowing students to engage with their peers and teachers through an interactive online assessment tool accessible via computers, smartphones, or tablets.

Lim and Yunus (2021) highlighted Quizizz's popularity as an e-learning platform offering customizable quizzes that can be shared anytime and from anywhere. Its accessibility and flexibility make it a preferred tool for both teachers and learners. Degirmenci (2021) emphasized that Quizizz supports various question formats, enabling teachers to create or select quizzes from a shared library, reducing their workload while maintaining student engagement.

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Quizizz stands out as a gamified educational tool that enhances learning through competition, interactivity, and real-time feedback. Its ease of access, engaging design, and ability to foster collaboration make it an effective platform for improving teaching and learning experiences.

3. METHODS

Research Design

In this part, the writer conducted an experimental research. According to Fraenkel et al., (2012), "Experimental research is the only type of study that seeks to directly manipulate a specific variable. When conducted properly, it is the most effective method for testing hypotheses related to cause and effect relationships."

The writer used 2 x 2 (two by two) factorial designs because there were two factors (Quizizz Aplication and cognitive style) and two categories (visualizer and verbalizer). In addition, Creswell (2012) "The aim of this design is to examine the individual and combined effects of two or more independent treatment variables on a specific outcome."

Data Collection Method

In this study, test and questionnaire were employed to gather data. The questionnaires were used to divide student cognitive style into visualizer category and verbalizer category is the first data collection method. The Likert scale was used and to make the questionnaire easier for the students to answer. The questionnaire was written in Bahasa Indonesia. The second set of data was gathered using pre-test as well as post- test types. For the experimental group and the control group, both tests were used.

The data collection process in a research study was referred to as an instrument (Fraenkel et al., 2012). In this study, a reading achievement test and questionnaire will be employed as research tools. The multiple-choice questions are adapted from various sources. Each test consisted of 25 items for reading comprehension achievement and 20 items for cognitive style, with four options per question. Brown (2004) states that multiple-choice tests are the most common way to assess reading comprehension because they are easy to administer and evaluate quickly. The test is used to measure the students' reading abilities before and after the intervention.

Data Analysis Procedures

According to Mayer (2019), cognitive style refers to the individual's preferred way of processing information, and can be broadly categorized into verbalizer and visualizer styles. In this study, students' preferences for processing information through verbal or visual means were measured using a Likert scale questionnaire. The questionnaire was divided into two parts: Part A focused on the verbalizer category, and Part B focused on the visualizer category. Each section contained ten statements related to the students' learning preferences, with responses scored on a five-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). A higher score in Part A indicates a greater preference for verbal processing, while a higher score in Part B suggests a stronger inclination towards visual learning.

Furthermore, the writer continued to give reading test. The test was administered twice, consisting of a pretest and a posttest. The pretest was given to assess the students' reading ability before the treatment, while the posttest was conducted to evaluate their reading ability afterward. This study was used a reading ability test to measure the students' performance and compare the reading abilities between the two groups. The test consists of 25 multiple choice questions. It was designed to determine the difference in students' progress before and after the treatment.

4. RESULTS AND DISCUSSION

Result

The following table presents the results of 256 students as the population grouping at SMP 28 Palembang after administering a cognitive style questionnaire. It shows the number of students categorized as verbalizers and visualizers (Table. 1).

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Table 1. The Students' Categorize

Group	Total
Verbalizer	124
Visualizer	132

The data in the table indicates that 124 students were categorized as verbalizers and 132 as visualizers. Based on this data, the writer formed two groups to proceed with the study: 16 visualizers and 16 verbalizers were selected randomly for the experimental group. The same method was applied to form the control group, ensuring an equal distribution of participants.

Additionally, the results of the independent sample t-test calculation for groups of students with visualizer and students with verbalizer in experimental group in terms of reading comprehension achievement are presented.

Table 2. Independent T-Test (Quizziz Application)

Independent Samples Test				
	Levene's Test for Equality of Variances		T-test for Equality of Means	
	F	Sig.	t	Sig. (2-tailed)
Quizizz Application	.334	.567	-9.136	.000

The significance level of 0.000 indicates that the findings of the significance level 0.05, was determined by computing the difference test between the two means of the data and is shown. As a result, H0 was not accepted and it can be said that students who had visualizer category taught using Quizizz Application and those who had Verbalizer category taught using Quizizz Application demonstrated significantly different reading comprehension achievement.

The results of the independent samples t-test for the students who have visualize category and those who have verbalizer category in control group toward reading comprehension achievement are presented.

Table 3. Independet Sample Test (Control Group)

Independent Samples Test				
	Levene's Test for Equality of Variances		t-test for Equality of Means	
	F	Sig.	t	Sig. (2-tailed)
Control Group	.334	.567	-9.136	.000

The results show that the Levene's test for homogeneity of variances yields a significance value of 0.567 ($p > 0.05$), indicating that the variances of the two groups were equal. In equal variances assumed, the significance level of 0.000. This can be indicated from the results of the significance level < 0.05. It was therefore concluded that H0 was not accepted and that there was a substantial difference in reading comprehension achievement between the students who have visualize category and those who have verbalizer category in control group.

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The following table demonstrated the results of the independent sample t-test calculation for groups of students with visualizer in the experimental and control group in terms of reading comprehension achievement.

Table 4. Independent Sample Test (Reading Comprehension)

Independent Samples Test				
	Levene's Test for Equality of Variances		t-test for Equality of Means	
	F	Sig.	T	Sig. (2-tailed)
Reading Comprehension	.334	.567	5.076	.000

The observation reveals that the calculation of the test of the difference two means data between students who have visualize category in the experimental and control group. The significance levels of 0.000, which indicated that the finding of the significance level 0.05. As a result, H0 was not accepted and it can be said that students with visualizer category in experimental group and those who had visualizer category in control group demonstrated significantly different reading comprehension achievement.

The tables below demonstrated the results of the independent sample t-test calculation for groups of students with verbalizer in the experimental and control group in terms of reading comprehension achievement.

Table. 5 Independent Sample Test (Reading Comprehension)

Independent Samples Test				
	Levene's Test for Equality of Variances		t-test for Equality of Means	
	F	Sig.	t	Sig. (2-tailed)
Reading Comprehension	.000	1.000	8.450	.000

The observation reveals that the calculation of the test of the difference two means data between students who have verbalizer category in the experimental and control group. The significance levels of 0.000, which indicated that the finding of the significance level 0.05. As a result, Ha was accepted and it can be said that students with verbalizer category in experimental group and those who had verbalizer category in control group demonstrated significantly different reading comprehension achievement.

The table below demonstrated the effect of variables, including the independent variable (teaching media) and moderator variables (cognitive style) on the dependent variable (reading comprehension).

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Table 6. The Significant Test

Tests of Between-Subjects Effects		
Dependent Variable: Result		
Source	Mean Square	Sig.
Corrected Model	1217.000	.000
Intercept	395641.000	.000
Cognitive_Style	1849.000	.000
Teaching_Media	1681.000	.000
Cognitive_Style * Teaching_Media	121.000	.012
Error	18.200	
Total		
Corrected Total		
a. R Squared = .770 (Adjusted R Squared = .758)		

In this study, the writer investigated the significance value of each variable to determine whether there is a significant interaction effect for the independent variable (Quizizz Application) and the moderator variable (Cognitive Style) on the dependent variable (reading comprehension). The decision was made based on the statement that when the value is below or equal 0.05, then there is a significant main effect for each of these variables.

Based on Table above, the results indicated that the teaching media (Quizizz Application) used in this study has a significant effect on student's reading comprehension achievement. Specifically, the analysis revealed that there is a significant main effect of the Quizizz Application compared to control group. This p-value, being less than 0.05, demonstrates that the Quizizz Application significantly enhances reading comprehension compared to control group.

In conclusion, the findings demonstrate that both the Quizizz application and students' cognitive styles play a crucial role in improving reading comprehension. The Quizizz application ($p < 0.001$) and cognitive styles ($p < 0.001$) have individually significant effects on students' performance. Additionally, the interaction between the Quizizz application and cognitive styles ($p = 0.012$) suggests that the application's impact is influenced by the cognitive styles of the learners. This indicates that the interaction effect is statistically significant, leading to the rejection of the null hypothesis. Thus, integrating the Quizizz application into teaching strategies can be an effective way to enhance reading comprehension, particularly when educators account for differences in students' cognitive styles.

Discussion

This study indicates that the use of the Quizizz application significantly impacts students' reading comprehension, particularly in relation to their cognitive styles, namely visualizers and verbalizers. The results show that verbalizer students achieved higher reading comprehension scores compared to visualizers. This is because verbalizers tend to process text-based information more effectively, while visualizers are more

comfortable with visual representations. However, the use of Quizizz helped improve the reading comprehension of visualizer students compared to those in the control group who did not use the application. This suggests that the gamification and interactive elements of Quizizz support their information processing.

Furthermore, the study found that the performance gap between the experimental and control groups further highlights the significant role of cognitive style in reading comprehension. In the control group, verbalizer students still outperformed visualizers, indicating that without digital learning tools like Quizizz, cognitive style remains a key factor in reading success. However, in the experimental group, visualizer students showed a more significant improvement compared to their counterparts in the control group. This suggests that Quizizz's interactive features provided additional support for their learning process.

The interaction between the teaching medium (Quizizz) and students' cognitive styles contributed to better learning outcomes. Although the application primarily delivers text-based content, its interactive features, such as instant feedback and gamification, helped enhance reading comprehension, particularly for students with a visual learning preference. Thus, this study emphasizes that selecting appropriate teaching tools that align with students' cognitive styles can improve learning effectiveness. These findings support Mayer's theory of multimedia learning, which suggests that learning is more effective when teaching media align with students' cognitive preferences.

5. CONCLUSION

this study highlights that digital learning tools like Quizizz can effectively enhance students' reading comprehension when appropriately integrated with their cognitive styles. The findings emphasize that students with different cognitive preferences—visualizers and verbalizers—respond differently to learning materials. Therefore, educators should take cognitive styles into account when selecting instructional media to maximize student learning outcomes. The results indicate that while Quizizz already benefits verbalizer students with its text-based format, adding more interactive and visual elements could further support visualizer students, making the platform more inclusive and effective for diverse learners.

The implications of this study suggest that digital learning applications should be designed with a more flexible approach to accommodate various cognitive styles. Educational technology developers can enhance platforms like Quizizz by incorporating multimedia elements such as images, videos, and interactive visual aids to better engage visual learners. Meanwhile, maintaining structured, text-based content will continue to support verbalizer students in strengthening their reading comprehension skills. Additionally, teachers can implement differentiated instructional strategies by leveraging digital tools to personalize learning experiences based on students' cognitive tendencies.

For future research, it is recommended to explore how different modifications to digital learning tools affect various cognitive styles beyond reading comprehension, such as in writing or listening skills. Studies could also investigate the long-term impact of using Quizizz on students' academic performance across different subjects and grade levels. Moreover, further research could examine how integrating adaptive learning technologies—such as artificial intelligence-driven personalization—can create more tailored learning experiences that cater to individual student needs. By continuing to refine digital learning tools, educators and developers can ensure that educational technology remains an effective resource for improving learning outcomes.

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