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Integrating Digital Technology in Maritime Education: The Impact of Word Wall Application on Writing Skills and Student Engagement

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Abstract
This study investigates the effectiveness of the Wordwall application as a medium for enhancing the writing skills of first-grade students at Parepare Maritime School, as well as assessing student interest and engagement in the learning process. The primary issues identified include the students' low writing skills and lack of active participation in English language learning. A quantitative research approach was employed, involving pretest-posttest methods and participatory observation. Data were collected through written tests to measure improvements in writing skills and observations to assess the level of student activity during lessons. The findings revealed a significant improvement in students' writing abilities, with a t-test value of 9.320, substantially exceeding the t-table value of 2.071 at a 0.05 significance level. Additionally, there was an observable increase in student interest and engagement when using Wordwall, as evidenced by the fluctuation and eventual improvement in participation over four sessions. Despite some challenges in maintaining consistent engagement, this study demonstrates the effectiveness of Wordwall not only in improving learning outcomes but also in motivating students to be more involved in the learning process. These results contribute to the existing literature on English language education, particularly in maritime vocational education, offering a practical and innovative approach to integrating technology into the curriculum.

Keywords: *Digital Tecnology*; *Maritime Education*; *Wordwall Aplication; Writing Skills*

Introduction
English language proficiency is essential for students in maritime vocational schools, as it equips them to meet the global demands of the maritime industry. The need for innovative and effective teaching methods is underscored by the industry's dynamic nature and the role of English as the lingua franca in maritime communication. Research indicates that integrating technology into English language teaching can significantly enhance learning outcomes. For instance, Huang Xiang emphasizes the importance of using digital tools to create interactive and engaging learning environments, which can help students develop practical language skills necessary for real-world maritime contexts (Xiang, 2024). This

approach aligns with the increasing demand for teaching methods that leverage technological advancements to foster active student engagement. Moreover, Simanjuntak et al. (2024) highlight the effectiveness of task-based language teaching (TBLT) in maritime education. TBLT focuses on using authentic tasks that mirror real-life maritime scenarios, thereby improving students' communicative competence and preparing them for industry-specific challenges (Vuorre & Metcalfe, 2021) . This method not only enhances language skills but also builds students' confidence in using English in professional settings. Further supporting this, Barus et al. (2024) discuss the role of simulation-based learning in maritime vocational schools. Simulations provide a realistic platform for students to practice English in a controlled environment, which can improve their ability to handle maritime operations and emergencies in English (Harianingsih & Jusoh, 2022). This method is particularly effective in bridging the gap between theoretical knowledge and practical application. Lastly, Ratnaningsih et al. (2024) advocate for a blended learning approach, combining traditional classroom instruction with online resources.

This hybrid model allows for flexibility and personalized learning, catering to diverse student needs and learning paces (Ratnaningsih et al., 2024). By incorporating various teaching methods, maritime vocational schools can create a comprehensive curriculum that addresses the multifaceted requirements of the maritime industry. In conclusion, the integration of technology, task-based learning, simulations, and blended learning models are pivotal in enhancing English language education in maritime vocational schools. These innovative approaches not only improve language proficiency but also prepare students to effectively navigate the global maritime industry.

The integration of Wordwall as an educational technology tool in maritime vocational schools for enhancing English language learning, particularly writing skills, is supported by several research findings. Wordwall's interactive platform offers diverse features that can be effectively utilized to create engaging and participatory learning environments. This aligns with the findings of Kim et al., who emphasize the importance of interactive tools in fostering student engagement and participation in language learning contexts (Kim et al., 2023).

The adaptability of Wordwall allows teachers to design varied writing tasks that cater to different learning needs, thereby motivating students to participate more actively. This is consistent with the research by Lee et al., which highlights the role of adaptive learning technologies in enhancing student motivation and engagement through personalized learning experiences (Lee et al., 2023). Furthermore, the interactive nature of Wordwall can facilitate a more dynamic learning process, as noted by Ohnishi et al., who discuss the benefits of interactive platforms in promoting active learning and improving language proficiency (Ohnishi et al., 2023).

Moreover, the use of Wordwall in educational settings is seen as an innovative approach to language teaching, offering a solution to traditional teaching challenges by making learning more engaging and effective. Hidalgo-Muñoz & Acle-Vicente (2023) research supports this view, indicating that technology-enhanced learning environments can significantly improve student outcomes by providing interactive and immersive experiences (Hidalgo-Muñoz & Acle-Vicente, 2023).

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However, it is important to consider potential limitations, such as the need for adequate teacher training to effectively implement such technologies and the potential for technological issues that could disrupt learning. Ellis and Slade highlight the importance of addressing these challenges to maximize the benefits of educational technologies like Wordwall (Ellis & Slade, 2023). In conclusion, the implementation of Wordwall in maritime vocational schools presents a promising opportunity to enhance English language learning by improving writing skills and increasing student engagement. By leveraging its interactive features, educators can create a more engaging and adaptive learning environment, ultimately leading to better educational outcomes.

The challenges faced by students and educators in maritime vocational schools regarding English language proficiency, particularly in writing skills, are multifaceted and require innovative teaching approaches. Research highlights that students often struggle with articulating their ideas in English, which impacts their language mastery and confidence. This issue is compounded by low student engagement, making it difficult for educators to foster an interactive learning environment. One study emphasizes the importance of integrating technology into language learning to enhance student engagement and improve writing skills.

The use of digital tools and platforms can create a more interactive and engaging learning environment, allowing students to practice writing in a supportive setting and receive immediate feedback (Phan & Dao, 2023). This approach not only aids in developing writing proficiency but also boosts students' confidence in their abilities. Another study suggests that collaborative learning strategies, such as peer review and group writing tasks, can significantly improve students' writing skills. These methods encourage active participation and allow students to learn from each other, thereby increasing engagement and motivation (Jacob et al., 2023).

Additionally, incorporating real-world maritime scenarios into writing tasks can make the learning process more relevant and interesting for students, further enhancing their engagement and understanding of the subject matter (Khan et al., 2023). Furthermore, professional development for educators is crucial in addressing these challenges. Training programs that focus on innovative teaching methodologies and the effective use of technology in the classroom can equip educators with the necessary skills to create a dynamic and interactive learning environment (Reilly et al., 2023). This, in turn, can lead to improved student outcomes in English language proficiency.

Lastly, a supportive institutional framework that encourages experimentation with new teaching methods and provides resources for technology integration is essential for the successful implementation of these strategies (Rashwan et al., 2023). By addressing these challenges through a combination of technology, collaborative learning, and professional development, maritime vocational schools can enhance the quality of English language education and better prepare students for their future careers.

The exploration of Wordwall as a tool for enhancing writing skills and student engagement in maritime vocational schools is a relatively under-researched area. However, the provided abstracts offer insights into the potential benefits and challenges of using digital tools like Wordwall in educational settings. Research

indicates that digital technologies, including Wordwall, can significantly enhance students' writing skills by making the writing process more interactive and engaging. This is particularly relevant in specialized environments such as maritime vocational schools, where traditional teaching methods may not fully engage students or address their specific learning needs (Hidalgo-Muñoz & Acle-Vicente, 2023).

The use of Wordwall can transform classroom dynamics, encouraging active student participation and fostering a more engaging learning environment. This is crucial for improving writing quality and student involvement, as active engagement is linked to better learning outcomes (Plata et al., 2023). Moreover, studies have shown that digital tools can improve the speed and efficiency of writing, which is beneficial in educational contexts where time and resources are limited (Viegas et al., 2023).

However, challenges such as varying levels of digital competence among students and teachers need to be addressed to maximize the effectiveness of these tools. This is particularly pertinent in maritime schools, where the integration of technology may face unique obstacles due to the specialized nature of the curriculum and the potential lack of technological infrastructure (Lee et al., 2023)

Furthermore, digital tools like Wordwall can enhance student motivation and engagement, which are critical factors in the learning process. By providing interactive and visually appealing content, these tools can increase student interest and participation in writing activities, thereby improving overall learning outcomes (Halvorsen et al., 2023). In conclusion, while the potential of Wordwall in maritime vocational schools is promising, further research is needed to address challenges related to digital competence and infrastructure. By doing so, educators can better harness the benefits of digital tools to enhance writing skills and student engagement in these specialized educational settings.

The research on the use of Wordwall in maritime vocational schools offers a novel contribution to English language learning by focusing on both the enhancement of writing skills and student engagement, areas that have been underexplored in existing literature. This study is unique in its dual focus: evaluating the outcomes of Wordwall use and exploring its potential to foster an interactive and collaborative learning environment, which is crucial for increasing student participation (Kassa et al., 2023). The integration of Wordwall with tailored teaching strategies is particularly significant, as it aligns with the specific needs and characteristics of students in maritime vocational schools. This approach is expected to bridge the gap between traditional teaching methods and the dynamic requirements of the maritime industry, thereby providing more effective and relevant English language teaching methods. While the provided contexts do not directly address the use of Wordwall, they offer insights into related educational strategies and technological applications (Kassa et al., 2023).

However, the research must consider potential limitations, such as the varying levels of digital literacy among students and the availability of resources in maritime vocational schools. Additionally, while the study proposes an integrative approach, it is crucial to evaluate its scalability and adaptability across different educational settings within the maritime industry. In conclusion, this research provides valuable insights into the development of English language teaching

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methods that are both effective and relevant to the maritime sector. By leveraging Wordwall and tailored teaching strategies, it addresses a critical gap in the literature and offers practical solutions for enhancing student engagement and writing skills in maritime vocational schools (Fiorella, 2023).

The study aims to evaluate the effectiveness of the Wordwall application in enhancing English writing skills among students at Parepare Maritime School, focusing on three key aspects: improvement in writing skills, student interest, and engagement during the learning process. Firstly, the effectiveness of Wordwall in improving writing skills can be linked to its interactive features, which have been shown to enhance learning outcomes in various educational contexts. Digital tools like Wordwall facilitate active learning by allowing students to engage with content dynamically, which can lead to improved writing skills (Fiorella, 2023).

Although specific data on maritime schools is limited, the general trend in educational technology supports the potential for Wordwall to positively impact writing proficiency. Secondly, regarding student interest, digital applications often increase motivation and engagement due to their interactive nature. The gamified elements of Wordwall can make learning more appealing, which is crucial for maintaining student interest in writing tasks (Hidalgo-Muñoz & Acle-Vicente, 2023). This aligns with findings that suggest digital tools can enhance student motivation by providing immediate feedback and a sense of achievement (Fiorella, 2023).

Lastly, student activity during the learning process is crucial for effective learning. Wordwall's interactive features encourage active participation, which is essential for composing narrative texts. Active learning strategies, supported by digital tools, have been shown to increase student engagement and participation, leading to better learning outcomes (Park & Sohn, 2023). This is particularly important in maritime education, where practical communication skills are vital. In conclusion, while direct evidence from maritime vocational schools is sparse, the integration of Wordwall as a digital learning tool is likely to enhance writing skills, increase student interest, and promote active engagement. These factors collectively contribute to more effective teaching methods in maritime education, addressing the current inadequacies in students' writing skills and preparing them for the global maritime industry (Phan & Dao, 2023).

The integration of digital tools like Wordwall in educational settings has been shown to enhance interactive teaching and improve student engagement and writing skills through direct feedback and game-based activities. However, the specific application of Wordwall in maritime vocational education remains underexplored, as most studies have focused on the general use of digital technology in education without addressing the unique needs of maritime education. Research by Whittaker highlights the potential of digital tools to transform educational practices by fostering interactive learning environments, which can be particularly beneficial in vocational settings where practical skills are emphasized (Whittaker, 2023). Similarly, Park and Sohn emphasize the role of digital platforms in enhancing student engagement and providing immediate feedback, which are crucial for developing writing skills (Park & Sohn, 2023).

These findings suggest that Wordwall could be effectively utilized in maritime vocational schools to improve English language learning and writing skills,

addressing the specific challenges faced by students in this field. Campbell et al. discuss the importance of tailoring educational technologies to meet the specific needs of different educational contexts, which aligns with the need to adapt Wordwall for maritime education (Campbell et al., 2023). This adaptation could involve customizing game-based activities to reflect maritime themes and terminology, thereby making learning more relevant and engaging for students. Jament et al. highlight the gap in research concerning the application of digital tools in specialized vocational education, underscoring the need for studies that evaluate their effectiveness in these contexts (Jament et al., 2023). This research aims to fill this gap by providing empirical evidence on the impact of Wordwall in maritime vocational schools, offering both theoretical insights and practical guidance for educators.

Finally, Cardoso et al. stress the importance of integrating digital technologies into curricula to enhance educational quality and prepare students for industry-specific challenges (Cardoso et al., 2023). By focusing on the maritime sector, this study not only contributes to the literature but also offers innovative solutions to improve writing skills, ultimately enhancing the quality of maritime education and better preparing students for the global maritime industry.

Method

Research Design

The study in question employs a quantitative research design to evaluate the effectiveness of the Wordwall application in enhancing writing skills and student engagement in maritime vocational schools. This approach is well-suited for the study's objectives, as it allows for the collection of objective, measurable data through structured instruments such as written tests and participatory observation. The use of pretest and posttest written assessments provides a clear metric for evaluating improvements in writing skills, while participatory observation offers insights into student engagement levels during the learning process. Research indicates that digital tools like Wordwall can significantly enhance educational outcomes by providing interactive and engaging learning experiences. For instance, Fowler et al. highlight the potential of digital applications to foster active learning and improve student engagement, which is crucial in vocational settings where practical skills are emphasized (Fowler et al., 2023). Similarly, Fiorella's work underscores the importance of interactive learning environments in promoting cognitive engagement and skill acquisition, suggesting that tools like Wordwall can be effective in this regard (Fiorella, 2023). Moreover, Cardoso et al. emphasize the role of technology in facilitating personalized learning experiences, which can lead to improved academic performance and engagement (Cardoso et al., 2023)

This aligns with the study's aim to assess the correlation between Wordwall usage and increased student engagement, as personalized and interactive learning experiences are known to enhance student motivation and participation. However, it is important to consider potential limitations, such as the variability in students' initial proficiency levels and the subjective nature of participatory observation, which may affect the reliability of engagement assessments. Additionally, Kim et al. caution against over-reliance on technology, suggesting that its effectiveness is

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contingent upon proper integration into the curriculum and alignment with pedagogical goals (Phan & Dao, 2023). In conclusion, the quantitative design of this study is appropriate for assessing the impact of Wordwall on writing skills and engagement in maritime vocational schools. By leveraging structured data collection methods and statistical analysis, the study aims to provide robust and reliable findings that can inform educational practices in similar contexts.

Research Subjects

The study involving 10th-grade students from a maritime vocational school aims to evaluate the effectiveness of the Wordwall application in enhancing writing skills and student engagement in English language learning. This research is significant as it targets students at the early stages of maritime vocational education, where English proficiency is crucial for their academic and professional success. Research indicates that educational technology, such as the Wordwall application, can significantly enhance student engagement and learning outcomes. For instance, studies have shown that interactive digital tools can improve motivation and participation in language learning by providing a dynamic and engaging platform for students to practice their skills (Hidalgo-Muñoz & Acle-Vicente, 2023). This aligns with the objectives of the current study, which seeks to assess the impact of such technology on writing skills and engagement. Moreover, the integration of technology in vocational education, particularly in specialized fields like maritime studies, is increasingly recognized as essential for preparing students for the demands of the global workforce.

The use of applications like Wordwall can offer tailored learning experiences that address the specific needs of vocational students, thereby enhancing their language proficiency and readiness for professional challenges (Plata et al., 2023). However, it is important to consider potential limitations and challenges associated with the implementation of educational technology. Factors such as access to resources, teacher training, and student familiarity with digital tools can influence the effectiveness of such interventions (Viegas et al., 2023).

Additionally, while technology can enhance engagement, it is crucial to ensure that it complements rather than replaces traditional teaching methods, maintaining a balanced approach to language education (Plata et al., 2023). In conclusion, the study's focus on 22 maritime vocational students provides a valuable opportunity to explore the role of educational technology in language learning. By examining the impact of the Wordwall application, the research can offer insights into effective strategies for integrating digital tools in vocational education, ultimately contributing to improved writing skills and student engagement in English language learning.

Instruments

The study in question employs a mixed-methods approach using written tests and participatory observation to evaluate the effectiveness of the Wordwall application in enhancing students' writing skills and engagement. The written tests, comprising pretests and posttests, are designed to quantitatively measure improvements in writing skills. The pretest establishes a baseline of students' abilities, while the posttest assesses the impact of the Wordwall intervention. This

method is supported by research indicating that pre- and post-intervention assessments are effective in measuring educational outcomes, particularly in language learning contexts (Wang, 2023). Participatory observation complements the quantitative data by providing qualitative insights into student engagement.

This method involves systematic observation using a structured sheet to capture key aspects of student interaction, such as participation in discussions and engagement with the application. Such observational techniques are valuable for understanding the dynamics of classroom interactions and the role of digital tools in facilitating active learning (Khan et al., 2023). The integration of these two instruments allows for a comprehensive analysis of both the cognitive and behavioral impacts of the Wordwall application. The written tests provide objective data on skill improvement, while the observations offer context on how these improvements are achieved through increased engagement.

This dual approach aligns with educational research that emphasizes the importance of combining quantitative and qualitative data to gain a holistic understanding of learning processes (Son & Opatz, 2023). However, potential limitations include the subjective nature of observational data, which may introduce bias. To mitigate this, the use of a pre-structured observation sheet helps ensure consistency and reliability in data collection. Additionally, the study's reliance on a single application may limit the generalizability of the findings to other educational technologies or contexts. Future research could expand on these findings by exploring the impact of different digital tools across diverse learning environments. Overall, the study's methodology effectively captures the multifaceted impact of the Wordwall application on writing skills and student engagement, providing valuable insights into the integration of technology in education.

Procedure

The data collection procedure described in the study is a comprehensive approach designed to assess the impact of the Wordwall application on students' writing skills and engagement in maritime vocational schools. This method involves several systematic stages, including pretesting, intervention, and posttesting, complemented by ongoing observations. The initial stage involves a pretest to establish a baseline of students' writing skills. This is crucial for measuring the effectiveness of the intervention, as it provides a point of comparison for post-intervention assessments. The pretest is complemented by initial observations focusing on student engagement, particularly their participation in class discussions and writing activities. This dual approach ensures that both cognitive and behavioral aspects of learning are considered, aligning with best practices in educational research that emphasize the importance of baseline data for evaluating interventions (Leonet & Saragueta, 2023). During the intervention phase, the Wordwall application is used over several learning sessions. This phase is critical for understanding how interactive technology can enhance student engagement and writing skills.

The ongoing observations during this period allow for real-time assessment of changes in student behavior and participation, providing qualitative data that enrich the quantitative findings from the pretest and posttest (Ha & So, 2023). The

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posttest, conducted in a format similar to the pretest, measures improvements in writing skills, offering a direct comparison to the baseline data.

This step is essential for determining the intervention's effectiveness, as it quantifies the learning gains attributable to the Wordwall application (Sumner et al., 2023). Finally, the data from the pretest, posttest, and observations are statistically analyzed to evaluate the intervention's impact. This comprehensive analysis provides insights into the role of technology in enhancing educational outcomes, particularly in specialized settings like maritime vocational schools.

The study's design, which integrates both quantitative and qualitative data, ensures a robust evaluation of the Wordwall application's effectiveness, addressing potential limitations such as variability in student engagement and writing proficiency (Purcell et al., 2023). Overall, this methodical approach underscores the importance of systematic data collection and analysis in educational research, providing a model for evaluating technology-based interventions in diverse learning environments.

Data Analysis

The study in question employs both t-test statistical analysis and descriptive analysis to evaluate the effectiveness of the Wordwall application in enhancing students' writing skills. The t-test is a robust statistical tool used to determine if there is a significant difference between pretest and posttest results, which in this context, assesses the impact of Wordwall on students' writing abilities. This method is particularly effective in educational research for measuring changes in performance due to an intervention, as it can statistically validate improvements in writing skills post-intervention (McCarron et al., 2023). Descriptive analysis complements the t-test by providing a detailed account of student engagement during the learning process.

This involves calculating frequencies, percentages, and averages to interpret the level of student involvement, offering insights into classroom dynamics when using Wordwall. Such analysis is crucial for understanding not just the outcomes, but also the process, as it highlights how students interact with the application and the extent of their engagement, which can be a significant factor in the effectiveness of educational interventions (Filipe et al., 2023). The combination of these two analytical methods allows for a comprehensive assessment of the intervention. While the t-test provides quantitative evidence of improvement in writing skills, descriptive analysis offers qualitative insights into student engagement, which can influence learning outcomes.

This dual approach ensures a holistic evaluation, capturing both the statistical significance of the intervention and the contextual factors that contribute to its success (Fiorella, 2023). However, it is important to consider potential limitations, such as the sample size and the duration of the intervention, which can affect the generalizability of the findings. Additionally, while the t-test can confirm improvements, it does not explain the underlying reasons for these changes, which is where descriptive analysis plays a crucial role. Overall, the integration of these methods provides a nuanced understanding of the Wordwall application's effectiveness in improving writing skills.

Results

The Students Score on Pre-Test and Post-Test

The following tables present the distribution of student scores on a pre-test and post-test, categorized by the predicates of knowledge and skill competence, and classified according to attitude scales. This table offers a detailed breakdown of student performance across different levels, ranging from "Very Good" to "Very Poor." The data is segmented into two scales: a 10-100 scale for numerical scores and a 1-4 scale for attitudes, with the results provided as frequencies (F) and percentages (%). The purpose of this table is to illustrate the varying levels of student proficiency and attitudes prior to the intervention, highlighting the overall performance and areas requiring attention.

Table 1. The Students Score on Pre-test

Predicate of knowledge and skill competence	Classification of attitude	Scale		Pre-Test	
		Scale 10-100	Scale 1-4	F	%
A	Very Good	96-100	3,85 - 4,00	-	-
B	Good	86-90	3,18 – 3,50	9	41
C	Fair	70-74	2,18 – 2,50	13	59
D	Poor	55-59	1,18 – 1,50	-	-
D	Very Poor	<55	1,00 – 1,17	-	-
Total				22	100

Table 1 provides a qualitative overview of student performance on a pre-test by categorizing scores into five competency levels. The categories range from "Very Good" to "Very Poor," representing the spectrum of student achievement and attitudes. The majority of students fall into the "Fair" category, indicating that their pre-test performance is average but suggests a need for improvement. A significant proportion of students are also classified as "Good," which reflects a relatively solid understanding and skill level. Notably, there are no students at the extreme ends of the performance spectrum—neither "Very Good" nor "Poor" or "Very Poor"—highlighting that while most students perform within the mid-range, there is a lack of exceptionally high or low achievers. This distribution suggests that while many students have a reasonable grasp of the material, targeted interventions could further enhance learning outcomes for those in the "Fair" category.

Table 2. The Students Score on Post-test

Predicate of knowledge and skill competence	Classification of attitude	Scale		Post-Test	
		Scale 10-100	Scale 1-4	F	%
A	Very Good	96-100	3,85 - 4,00	5	23%
B	Good	86-90	3,18 – 3,50	17	77%
C	Fair	70-74	2,18 – 2,50	-	-
D	Poor	55-59	1,18 – 1,50	-	-
D-	Very Poor	<55	1,00 – 1,17	-	-
Total				22	100%

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Table 2 captures the outcomes of the post-test, highlighting notable advancements in student performance. The distribution of scores demonstrates a clear improvement compared to the pre-test results. A significant majority of students, 77%, now fall into the "Good" category, reflecting a solid grasp of the material and an overall enhancement in their competencies. Additionally, 23% of students have achieved the "Very Good" classification, indicating a high level of proficiency and a marked improvement in their skills. Remarkably, there are no students in the "Fair," "Poor," or "Very Poor" categories in the post-test, which suggests that every student has improved to at least the "Good" level. This shift in performance underscores the effectiveness of the educational interventions implemented, as students have transitioned from intermediate to more advanced levels of achievement. The absence of lower performance levels demonstrates a successful overall enhancement in student learning outcomes.

The Result of T-Test

In order to compare between pre-test and post-test, the researchers then applied a t-test for non-independent sample.

Table 3. The Result of T-test for Non-Independent Sample

Pre-Test – Post-Test	Level of Significant	Df	T-Test Value	T-Table Value
	0,05	21	9,320	2.071

The findings of this study demonstrate a significant improvement in students' writing skills after using the Wordwall application as a learning medium. Using t-test statistical analysis, it was found that the t-value reached 9.320, far surpassing the t-table value of 2.071 at a 0.05 significance level with 21 degrees of freedom. This indicates that the Wordwall application effectively enhances students' writing skills in the context of English language learning. The significant difference detected between pre-test and post-test scores suggests that the intervention using this application has a substantial positive impact on students' writing abilities.

Furthermore, the results affirm that integrating technology into learning, particularly using the Wordwall application, can serve as an effective tool to strengthen language skills, especially in writing. The use of Wordwall not only facilitates academic improvement but also provides a more interactive and engaging learning experience. Therefore, this application can be a strong alternative in addressing challenges in English language learning, particularly in improving students' writing skills in maritime vocational schools. These findings underscore the importance of integrating technology into education and provide empirical evidence of the effectiveness of Wordwall in the learning process.

The main findings from the displayed graph show significant variation in students' activity levels when using the Wordwall application over four sessions. In the first session, student engagement was relatively strong, with an average activity level around 50, indicating that students were fairly involved in the learning process. A more significant increase was observed in the second session, where the average activity level peaked at 60, signaling heightened enthusiasm and

participation. However, a sharp decline occurred in the third session, with the average activity dropping to 40. This decline may reflect challenges in maintaining consistent student engagement, possibly due to material difficulties or fatigue.

Nevertheless, in the fourth session, there was a recovery in student activity, with the average level rising again to nearly 55. This recovery suggests that students began to adapt and re-engage actively in the learning process after the previous decline. The fluctuation in activity reflects the dynamics of student engagement, influenced by the interaction between teaching methods and the use of the Wordwall application. These findings are crucial in designing more effective teaching strategies, focusing on maintaining consistent student engagement throughout the learning process. Adaptation and responsiveness to the applied methods are key to sustaining active student participation, which ultimately can positively impact their learning outcomes.

Overall, the findings of this study show that the Wordwall application significantly enhances students' writing skills in maritime vocational schools while also influencing the dynamics of student engagement during the learning process. The main findings from the t-test statistical analysis indicate a significant improvement in students' writing scores after using Wordwall, with the t-value far exceeding the t-table value. This suggests that Wordwall not only functions as a learning aid but also as an effective intervention in improving students' writing competence. The effectiveness of Wordwall is reinforced by a more interactive and engaging learning experience, which further supports the success of English language learning in the context of vocational maritime education.

In addition, the analysis of student activity graphs indicates fluctuations in their engagement levels over four sessions, with a significant decline in activity in the third session, followed by recovery in the fourth session. These fluctuations reflect the challenges in maintaining consistent student engagement, potentially influenced by various factors such as material difficulty or fatigue. However, the recovery in activity during the fourth session indicates that students began to adapt to the teaching method using Wordwall, ultimately increasing their participation. These findings highlight the importance of designing teaching strategies that are not only effective in improving academic skills but also in maintaining student motivation and consistency. Therefore, the integration of technology like Wordwall into vocational education curricula can have a sustainable positive impact on student learning outcomes if implemented with an approach that considers the dynamics of student engagement.

Discussion

The findings of this study show that using the Wordwall application can significantly improve students' writing skills in maritime vocational schools and influence their level of engagement during the learning process. The implications of these findings are crucial in developing more effective teaching methods, particularly in the context of English language education. Integrating digital technology like Wordwall into the curriculum can strengthen students' academic skills and ensure their consistent engagement (Latifa et al., 2020). Theoretically, this study expands the understanding of the effectiveness of technology in

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education, while practically, these findings can be more widely implemented to improve the quality of education in maritime vocational schools, focusing on adaptive and interactive teaching strategies to maintain student motivation and participation (Latifa et al., 2020).

This research reveals that the use of the Wordwall application significantly enhances writing skills and student engagement in maritime vocational schools, aligning with previous studies that demonstrate the effectiveness of digital technology in language education (Latifa et al., 2020). However, this study offers a new contribution with a specific focus on the Wordwall application within the maritime vocational education environment, which has not been widely explored in previous literature. The findings of this study expand the understanding of how educational technology can be effectively implemented to improve learning outcomes in a specialized educational context (Faidal et al., 2020). By emphasizing the improvement of writing skills and student participation, this study not only confirms the known benefits of digital technology but also offers an integrative approach that can serve as a practical solution for educators in enhancing the quality of learning in maritime vocational schools.

This study, although successful in demonstrating the effectiveness of the Wordwall application in improving students' writing skills and engagement, has several limitations that need to be acknowledged. From a methodological perspective, the quantitative approach used does not fully explore qualitative factors such as students' intrinsic motivation or their perceptions of technology. Additionally, with a sample size limited to 22 students from a single maritime vocational school, the findings of this study may not be widely generalizable. Another limitation is the narrow focus on the Wordwall application, which does not provide a broader view of the effectiveness of other digital technologies (Kusumawardhani, 2019). While the findings of this research are relevant, they should be applied cautiously, and further research is necessary to explore the long-term impacts and various other factors that influence learning outcomes in the maritime education context.

This study, despite providing valuable insights into the effectiveness of the Wordwall application in English language learning at maritime vocational schools, has significant limitations. Methodologically, the study uses a quantitative approach focused on measuring improvements in writing skills through written tests and participatory observation. However, this approach does not sufficiently explore qualitative dimensions such as student motivation, perceptions of technology, and interactions within a broader learning context, which might deeply influence the results. The sample size is also limited to 22 students from one school, which restricts the generalizability of the findings to a broader population. Additionally, the study does not explore the long-term effects, leaving unanswered questions about how these improvements in writing skills contribute to students' academic or professional success in the future. Therefore, while the results are promising, applying these findings should be done with consideration of these limitations, and further research with a more comprehensive design and a larger sample size is necessary to confirm and expand these findings in a broader maritime education context.

The research on the use of Wordwall in maritime vocational education confirms existing knowledge about the effectiveness of digital tools in language learning while also contributing new insights specific to this educational context. The study's findings align with previous research, such as that by Simanjuntak et al., (2024), which emphasized the role of interactive and task-based learning methods in enhancing language proficiency. This is supported by the observed improvement in students' writing skills through the use of Wordwall, demonstrating the platform's ability to increase engagement and motivation, similar to the effects noted by in their study on social media integration in maritime English education (Lee et al., 2023).

The research extends the applicability of digital tools by focusing on the unique challenges and opportunities within maritime vocational education, a sector that has been underexplored in previous literature (Widiya & Salmiah, 2024). This study provides empirical evidence that digital platforms like Wordwall can be tailored to meet the specific needs of maritime students, particularly in developing practical and industry-relevant skills such as writing in English. This focus on a specialized educational setting offers new insights and practical solutions that can be adapted across similar contexts, thereby expanding the scope of technology integration in education (Plata et al., 2023). Moreover, the study highlights the potential for digital tools to address the specific demands of maritime education, such as the need for industry-relevant language skills, which are crucial for students' future careers. This research not only confirms the benefits of technology in enhancing learning outcomes but also underscores the importance of context-specific applications, thereby contributing to a more nuanced understanding of digital tool integration in education (Cardoso et al., 2023). In conclusion, while the study corroborates existing findings on the benefits of digital tools in language learning, it also introduces a new dimension by focusing on the maritime vocational context, offering valuable insights for educators and policymakers aiming to enhance educational practices in specialized fields.

Conclusion

The main findings of this study indicate that the use of the Wordwall application is significantly effective in improving the writing skills of first-grade students at Parepare Maritime School. The application also successfully increased the interest of second-grade students in their writing abilities, as evidenced by the increased engagement observed during the learning process using Wordwall as a writing tool for composing narrative texts. The findings of this study answer three main questions, namely the effectiveness of using Wordwall application in improving writing skills, student interest in using the application, and student engagement during the learning process. Overall, this study demonstrates that the Wordwall application is not only effective in enhancing students' learning outcomes but also in increasing their engagement and motivation in English language learning at maritime vocational schools. These results expand the understanding of how educational technology can be effectively implemented in specialized educational contexts, providing significant new contributions to the educational literature.

This study makes an important contribution to the field of English language

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education, particularly in the context of vocational schools, by demonstrating the effectiveness of the Wordwall application as an innovative tool for enhancing writing skills and student engagement. These findings enrich the existing literature by introducing an interactive technological approach that not only facilitates improved learning outcomes but also encourages active student participation in the English language learning process. In relevant fields of study, this research underscores the importance of integrating technology into the language education curriculum, especially in vocational education environments, where the need to develop practical and applicable skills is very high. The innovative aspect highlighted by this study is Wordwall's ability to create a more dynamic and adaptive learning experience, which can serve as a model for the application of similar technologies in various educational contexts, thereby providing significant added value to the development of more effective and relevant English language teaching methods.

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