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Implementation of Wordwall Based Learning Modules to Improve Student Learning Activities in Elementary Schools

Katrunnada*,Siti Mayang Sari, Akmaluddin
Universitas Bina Bangsa Getempena, Banda Aceh, 23112, Indonesia

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* *Corresponding author:*

E-mail: Katrunnada22@gmail.com

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A B S T R A C T

Education is a conscious and planned effort to develop human resources towards better and better quality. The fourth grade teacher, Mrs. YS, said that during the teaching and learning process teachers still often carry out learning using the lecture method as is generally used so that the learning process occurs conventionally and there is a lack of student activity during learning so that student learning outcomes are still relatively low. This research aims to examine the implementation of Wordwall-based learning in elementary schools and identify its impact on students' motivation and understanding in learning.This research uses quantitative research with a quasi-experiment approach. The data analysis technique used in this research includes descriptive analysis. The research results found that the implementation of Wordwall-based learning in elementary schools had a positive impact on improving student learning outcomes and interest. Classes that use Wordwall as a learning medium show a more significant increase in learning outcomes compared to classes that use conventional methods. This is shown by the difference in the increase in posttest scores between the experimental group and the control group, where the experimental group experienced an increase of 29%, while the control group only increased 11.2%.

1. Introduction

Learning is an effort made by a teacher so that the process of acquiring science and knowledge, mastering skills and habits, and being able to form attitudes and self-confidence in students can be formed (Sari et al., 2023). In an effort to improve the quality of learning, various innovations continue to be developed, one of which is through the use of technology in the teaching and learning process (Sugiarti Dwi Gita, nd). In the world of education that continues to develop, the use of technology in learning is increasingly becoming a necessity to create a more interesting and effective learning process. Along with the development of a curriculum that is oriented towards strengthening students' competencies and conceptual understanding, innovation in learning methods is very necessary (Education &

Counseling, nd). The implementation of the Merdeka Curriculum is not carried out simultaneously and massively refers to a policy that gives schools flexibility in implementing the curriculum. Data collection on school readiness in the Implementation of the Independent Curriculum (IKM) was carried out by the Ministry of Culture Research and Technology (Mustafiyanti et al., 2023).

The teaching module has actually been provided by the Ministry of Education, Culture, Research and Technology through the government application, namely the Merdeka Mengajar Platform (PMM). Educators can use or modify the teaching module, but many educators are still confused about modifying or compiling their own teaching modules (Noviantari & Alrinda Agustina, n.d.). But in reality there are still many teachers who do not really understand how to compile and develop teaching modules, especially in the self-directed learning curriculum (Curriculum Merdeka) (Rahmah et al., 2024). The teaching module in the Independent Curriculum can be interpreted as a document containing learning objectives, steps, and media, as well as assessments required in one learning unit/topic that is compiled based on the Independent Curriculum (Gulo and Tafonao, 2023).

Not a few teachers experience difficulties in creating teaching modules, obstacles that may be faced in creating teaching modules include: (1) limited resources such as expertise in developing materials, technology, and graphic design; (2) module development skills where teachers must have a deep understanding of the material to be delivered, the ability to present material in clear and easy-to-understand language, and the ability to design interesting and effective learning activities; (3) and continuous evaluation to ensure that the module is effective in achieving learning objectives (Agusty et al., 2023). Problems faced by teachers in compiling teaching modules include: (1) teachers have difficulty in analyzing the conditions and needs of teachers, students and the school environment; (2) teachers have difficulty identifying and determining the dimensions of the Pancasila student profile; (3) teachers have difficulty in compiling teaching modules with the available components, the components that still make it difficult for teachers are determining time allocation, determining the dimensions of the Pancasila student profile, determining facilities and infrastructure and determining remedial components; (4) there are still teachers who do not make modules regularly; (5) teachers do not receive enough training on making teaching modules (Hoffman, 2020).

In the subject of Natural and Social Sciences (IPAS), student learning outcomes are often the main step in learning success. Learning IPAS in Elementary Schools faces challenges, such as materials that are sometimes abstract and less interesting. Therefore, the development of innovative learning media is one step to improve student learning outcomes. One of the media that can be used is a Wordwall-based teaching module. This media is able to attract students' attention and increase their active participation in learning. In addition, the integration of games into learning can help students understand abstract concepts in a fun way. Learning that is carried out using Wordwall has a higher level of interest and has a better effect on learning outcomes compared to conventional learning (Puspitasari et al., 2023). With the use of Wordwall in learning can provide a significant positive impact on student

learning outcomes. By using this learning module students show more joy and involvement in the educational process when information is delivered through games (Usmaedi, 2023).

One of the increasingly popular media in learning is Wordwall, a digital platform that allows teachers to create a variety of interactive activities, such as quizzes, crosswords, word matching, and other educational games. However, although Wordwall's potential in learning is quite large, its implementation in learning modules is still not optimal. Many teachers in elementary schools have not utilized this platform optimally, either due to limited understanding of technology, lack of access to supporting devices, or minimal training related to the use of Wordwall in compiling learning modules.

In addition, there has not been much research that specifically discusses the effectiveness of Wordwall implementation in improving students' understanding and interest in learning in elementary schools. As a technology-based platform, Wordwall has the advantage of creating more interesting and interactive learning. The use of Wordwall in learning is expected to help students understand abstract concepts more concretely through fun activities. Thus, learning is not only one-way, but also more participatory and oriented towards students' learning experiences. In addition, the application of Wordwall-based learning can also be a solution to the problem of low student learning motivation.

Game-based learning or educational games are known to be able to increase student involvement in the learning process and strengthen their memory of the material being taught (Munafis et al., nd). Therefore, further research is needed on the implementation of Wordwall-based learning in Elementary Schools to determine the extent of its effectiveness in improving the quality of learning and the obstacles that may be faced in its implementation. Based on this background, this study aims to examine the implementation of Wordwall-based learning in Elementary Schools and identify its impact on students' motivation and understanding in learning. It is hoped that the results of this study can contribute to the development of more innovative and effective learning strategies for education in Elementary Schools.

Research on the use of digital-based learning media has been widely conducted in recent years. For example, research by Ananda(ananda. 2023)shows that the use of educational game applications can improve the critical thinking skills of elementary school students. In addition, a study by Kurniawan(Suci Hanifah Nahampun et al., 2024). proves that game-based learning can improve student learning outcomes compared to conventional methods. However, research that specifically implements Wordwall-based learning in elementary school science learning is still limited. The novelty of this research lies in the development of learning that combines Wordwall with effective learning strategies, so that it can be implemented systematically in the elementary school curriculum. Based on the results of observations that have been carried out at Labuy State Elementary School in October 2024, learning that occurs in the classroom is still running conventionally. Class IVA teacher Mrs. YS said that during the teaching and learning process, teachers still often use module guides with lecture methods as is generally used. In addition, Mrs. YS said that in

making teaching modules, they still look at guides on Google and duplicate modules on the internet. Teacher YS also explained that during learning in class IVA, game-based learning had never been used. Mrs. YS found it difficult to create interesting modules due to the lack of ability to innovate teaching modules. As a result, the material presented does not fully comply with the expected competency standards, both in terms of material depth and its relevance to the current context. This lack of suitability has an impact on the effectiveness of learning, because students do not get interesting learning that is in accordance with their era and needs. Uninteresting modules create a boring learning atmosphere. So that during the learning process, it does not foster optimal learning activity so that it affects student learning outcomes. Efforts need to be made through the development of modules that are more interactive, project-based, interesting and in accordance with students' daily lives.

The Wordwall-based science learning module is used by teachers as a reference in implementing learning and making learning happen actively, interestingly, creatively and innovatively so that it can improve student learning outcomes. By developing the learning module, the author intends to improve the quality of learning. In the learning module, of course, there is a learning model that supports maximizing the learning process. The learning model is essentially a form of learning that is depicted from beginning to end which is presented in a unique way by the teacher including approaches, strategies, methods, techniques and even learning tactics that have been arranged into a whole unit (Sari et al., 2023b).

In this module the author chooses the PjBL learning model with the Wordwall game which will be used to enhance learning in the teaching module being developed. The PjBL model combined with the Wordwall game is a learning model in the form of projects and games that are specifically designed to help make the learning process more interesting and can increase student activity so that learning outcomes increase. This learning requires students to learn, but with emphasis on playing (Medila and Suryani, 2023). Wordwall is a game option in learning that applies a game to help students in the active learning process (Hasanah et al., 2024).

This learning is very suitable to be applied to science learning, especially in social studies material which has been considered as boring learning because of the many theories and notes received by students without any games. By using good teaching modules and learning models, educators can carry out the learning process optimally. Likewise, students will feel the fun of learning so that they are able to absorb the knowledge and science gained from learning by doing projects and playing directly. This research aims to examine the implementation of Wordwall-based learning in elementary schools and identify its impact on students' motivation and understanding in learning. This research is important because it can help increase student interest and involvement in science learning in elementary schools, provide solutions for teachers in integrating technology into the learning process effectively, and develop innovative learning modules based on Wordwall that can be used as references in digital learning in elementary schools.

2. Methodology

This research is a quantitative research with a quasi-experimental approach. Quantitative research is a research method that uses numerical data (numbers) and statistical analysis to test hypotheses or answer research questions. The main purpose of quantitative research is to find cause-and-effect relationships, test theories, and make generalizations based on the samples studied. .Meanwhile, the quasi-experimental approach is a research method that aims to test the causal relationship between independent variables (treatment) and dependent variables (outcomes) without using random subject grouping (random assignment) (Rifka Agustianti et al., 2022). This method is used to test the effectiveness of the implementation of Wordwall-based learning on the interests and learning outcomes of Elementary School students.

This study uses a Nonequivalent Control Group Design, where there are experimental groups and control groups that are not selected randomly. This study was conducted in January, precisely in the even semester of the 2024/2025 academic year. The research location was at Labuy Public Elementary School, Aceh Besar, which was selected based on certain criteria, such as the availability of information technology facilities and teacher readiness in using digital learning media. The target in this study was grade IV Elementary School students. The research objectives include increasing student interest and learning outcomes after implementing Wordwall-based learning on the material "Me and My Needs" in the Natural and Social Sciences (IPAS) subject. The subjects in this study consisted of two groups, namely the experimental group, which were grade IVA students who received Wordwall-based learning and the control group which were grade IVB students who received conventional learning without Wordwall.

This research was conducted through several stages, namely the preparation stage which includes a series of preparation of learning devices including wordwall games, then the researcher also determined the research sample where the research sample was 27 class IVA students, and then what was done at the preparation stage was developing the necessary research instruments.The second stage is the p stageimplementation that contains activities to provide pretests to both groups to determine initial abilities, followed by implementing learning according to the treatment given to each group, then providing a posttest to measure changes in student learning outcomes after the treatment is given. The third stage is data analysis which contains activities to process pretest and posttest data, then conducting statistical tests to determine significant differences between the experimental group and the control group. The instruments used in this study include pretest and posttest tests used to measure learning outcomes before and after learning, a learning interest questionnaire used to determine the level of student interest in using Wordwall-based modules, and Observations and Interviews used to obtain additional data regarding student and teacher responses to the use of Wordwall learning media.

Data analysis techniques used in this study include descriptive analysis used to describe the results of the pretest, posttest, and student learning interest

questionnaires, normality and homogeneity tests used to ensure that the data meets the assumptions of parametric statistical tests, t-test (Independent Sample T-Test) used to test the difference in average learning outcomes between the experimental group and the control group, N-gain test used to measure the increase in student learning outcomes after treatment is given. In this study, the research ethics that are maintained include approval from the school, approval from the parents of students, confidentiality of data that is maintained and only used for academic purposes.

3. Result and Discussion

Meanwhile, class A, which acts as an experimental class, consists of 27 students, with a composition of 15 male students and 12 female students. Unlike the control class, students in this class receive learning using a Wordwall-based teaching module, a digital-based learning media that allows for active interaction through educational games, quizzes, and other interactive activities. Before being given Wordwall-based learning, students in class A were also given a pretest to measure their initial understanding of the material Me and My Needs. The pretest results showed that the average score obtained by students was 53%, slightly higher than the control class, but still in the low category.

After going through the learning process using Wordwall, students were given a posttest again to find out how much their understanding had improved after participating in learning with technology-based methods. The posttest results showed a significant increase, with the average student score reaching 82%, which means there was an increase of 29% from the pretest results. The much higher increase in learning outcomes compared to the control class indicates that Wordwall-based learning is more effective in helping students understand the material.

Several factors that contributed to the higher increase in learning outcomes in the experimental class were: More active student involvement, as they are given the opportunity to learn while playing through interactive media, More interesting material delivery, where the concepts in the material Me and My Needs are visualized through various educational activities, There is an element of gamification, which makes students more motivated to understand the material because they feel challenged to complete the various quizzes and games provided, Increased student focus and attention, because learning does not only take place in one direction as in the lecture method, but involves direct interaction between students and the media used.

From the table 1, it can be seen that the experimental class using Wordwall experienced an increase in learning outcomes of 29%, while the control class using conventional methods only increased by 11.2%. This shows that the use of interactive media such as Wordwall is more effective in improving student understanding compared to conventional lecture methods.

Table 1. Comparison of Learning Effectiveness

Class	Number of Students	Pretest (%)	Posttest (%)	Increase (%)
B (Control)	25 (M: 15, F: 10)	49.8%	61%	11.2%
A (Experiment)	27 (M: 15, F: 12)	53%	82%	29%

In addition, from the results of observations during the learning process, it was found that students in the experimental class were more enthusiastic and motivated to participate in learning, while students in the control class tended to be less active and passive in receiving the material. This further strengthens the finding that learning involving interaction and gamification can increase students' interest in learning and their academic results. This difference can be explained by several main factors:

1. Interactivity in Wordwall-based learning

   Interactive media such as Wordwall allows students to learn more actively through educational games, quizzes, and visual activities. This is in line with the theory of Constructivism Learning (Piaget, 1952) which states that students will understand the material better if they are directly involved in the learning process through exploration and interaction.(Rifka Agustianti et al., 2024).
2. Gamification as a driver of learning motivation

   Wordwall-based learning has been proven to increase student motivation because it provides challenges, rewards, and enjoyable learning experiences. In this study, students in the experimental class were more enthusiastic in solving Wordwall problems than students in the control class who only received passive learning.
3. Increased engagement and information retention

   From the observation results, students in the experimental class showed higher participation in class discussions and were able to remember the material better than the control class.

As for bSome of the main factors that contribute to the effectiveness of Wordwall in improving student learning outcomes include Better Material Visualization allows the presentation of abstract concepts in a more concrete form through visual and interactive elements. This is very helpful for Elementary School students who are still at the concrete operational stage according to Piaget's cognitive development theory (1952); Increased Student Engagement and Focus compared to lecture methods that tend to be boring for students, Wordwall provides a more dynamic learning experience. Interaction in educational games helps maintain student focus longer, as stated in Anderson & Krathwohl's (2001) study on cognitive learning taxonomy; Adaptation to student learning styles obtained based on interviews with grade IV teachers showed that students with visual and kinesthetic learning styles find it easier to understand material when presented through Wordwall compared to lecture methods. This is in accordance with Fleming's VARK Model theory which states that each student has a different learning style (Visual, Auditory, Reading/Writing, Kinesthetic).

The findings of this study have several important implications for the world of education, particularly in the implementation of technology in elementary school learning:

1. Optimizing the Use of Digital Media in Elementary School Curriculum

   The results of this study indicate that the use of Wordwall as a digital-based learning media can significantly improve students' understanding. Therefore, schools and teachers need to start considering the use of interactive digital media as part of a learning strategy, especially in subjects that require an understanding of abstract concepts.
2. The Need for Training for Teachers in Using Educational Technology

   One of the obstacles in implementing Wordwall found in this study is the lack of understanding of teachers in integrating technology into learning. Therefore, training is needed for teachers so that they can optimize the use of interactive media in the learning process.
3. Further Development of Wordwall-Based Learning Modules

   The success of implementing Wordwall in this study opens up opportunities to develop game-based learning modules more broadly, not only for science subjects but also for other fields of study such as Mathematics and Indonesian.

Figure 1. Processing of Learning Make to Wordwall

Learning by wordwall as online platform that enables teachers to create and share interactive learning activities, such as quizzes, games, and exercises. In an effort to increase student engagement in learning, educational game-based technology is increasingly being used in elementary school environments. One tool that can support this process is Wordwall, a digital platform that allows teachers to create various interactive activities. In this picture, you can see how a teacher is compiling learning materials using Wordwall. Teachers can adjust quiz questions, crosswords, and various other educational games that are relevant to the material being taught. With an attractive and user-friendly design, Wordwall allows teachers to easily develop various activities that are appropriate to the level of student understanding. In addition, the gamification feature in Wordwall can increase student learning motivation, because they feel like they are playing while learning. The use of Wordwall in learning not only helps students understand the material in a more

enjoyable way, but also gives teachers the opportunity to measure student understanding directly through the results of the quizzes they complete.

Figure: 2. Processing Learning with Game Base

Online game-based learning is an innovative approach to education that utilizes online games to facilitate learning. This method has gained popularity in recent years due to its ability to increase student engagement and motivation. Integrating Online Games into Learning as using online games as a tool to supplement traditional teaching methods. online games as a learning activity that promotes interaction and engagement. Games as a form of assessment to evaluate student understanding and knowledge. Game-Based Learning approaches have been shown to improve student participation and understanding in various subjects. This image illustrates how students interact with learning materials through digital game-based media.

By using this technology, students can be more active in learning because they have to think critically, solve challenges, and compete with their friends in a positive environment. One of the main advantages of this approach is its ability to overcome boredom that often occurs in conventional learning methods. In addition, game-based learning also helps students develop problem-solving skills, improve memory, and reinforce previously learned concepts. In the context of social studies learning in elementary schools, the use of Wordwall-based educational games can help students understand abstract concepts more concretely through simulations, interactive illustrations, and challenge-based activities.

Games specifically designed for learning, such as math games, language games, and science games. Games that simulate real-world situations, such as business simulation games, financial simulation games, and environmental simulation games. Games that require critical thinking and logic, such as puzzle games, Sudoku, and other brain teasers. This image shows how students can learn through games that are specifically designed to improve their understanding of a material. Game-based learning is not only focused on entertainment, but is also designed so that students can develop a deeper understanding of academic concepts. One of the interesting features in educational games is the presence of various levels of difficulty that can be adjusted to the student's ability. In addition, students also get

direct feedback after completing each challenge, which allows them to understand their mistakes and learn from the experience. In the study conducted, the results showed that students who learned with a game-based learning approach experienced a significant increase in learning outcomes compared to students who learned through conventional methods. Thus, integrating Wordwall in game-based learning can be an effective solution to increase students' interest in learning and help them achieve better results in learning.

Effective learning and teaching practices are essential for achieving academic success. The effectiveness of the learning process is greatly influenced by the methods used by teachers in delivering the material. This image illustrates how teachers apply more interactive teaching strategies by involving students in technology-based activities. In this approach, the role of the teacher is not only as a transmitter of information, but also as a facilitator who guides students in the process of exploration and problem solving. By using technology such as Wordwall, teachers can create a more interesting and interactive learning environment. In addition, this method also provides opportunities for students to learn independently and work together with their friends in completing challenges. The results of the study showed that students who were actively involved in interactive learning tended to have a better understanding of the material being taught. Therefore, the use of technology-based learning media is one solution to improving the quality of learning in elementary schools.

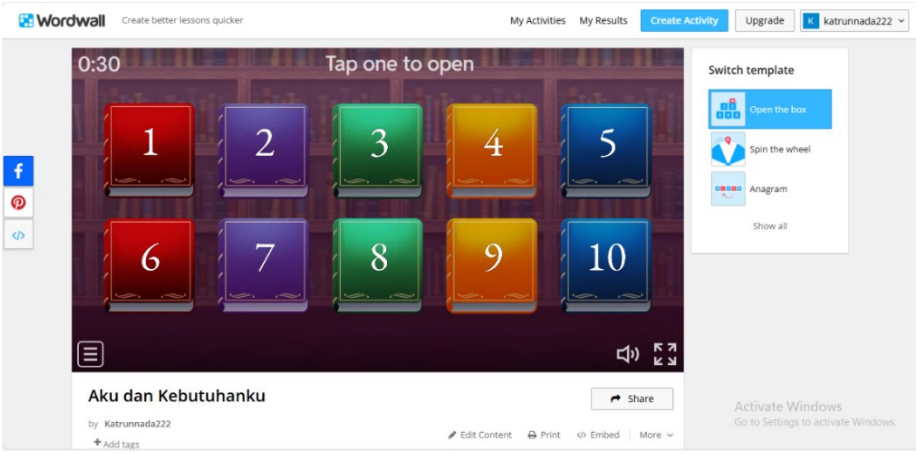

Figure 3. Wordwall Games

This image shows one example of an educational game available on the Wordwall platform. This game is designed to make the learning process more interesting and fun for students. In this game, students can answer questions, match words with definitions, or solve puzzles related to the learning material. The use of game elements such as points, levels, and challenges makes students more motivated to complete their tasks well. In addition, teachers can also monitor student progress through the results of the games that have been completed. The study conducted in this study showed that classes using Wordwall experienced a 29% increase in learning outcomes, compared to classes using conventional methods which only increased by 11.2%. This proves that the use of technology-based educational

games can have a significant positive impact on improving students' understanding of learning materials.

4. Conclusion

Based on the results of the study, it can be concluded that the implementation of Wordwall-based learning in Elementary Schools has a positive impact on improving student learning outcomes and interests. Classes that use Wordwall as a learning medium show a more significant increase in learning outcomes compared to classes that use conventional methods. This is indicated by the difference in posttest score increases between the experimental group and the control group, where the experimental group experienced an increase more than in the control group. These findings indicate that the use of interactive media such as Wordwall can increase student engagement in the learning process, make the material more interesting and easy to understand, and increase learning motivation. Factors that support the effectiveness of Wordwall include the presence of gamification elements that motivate students, more interactive presentation of materials, and increased active student participation in the learning process. Based on the results of this study, it is recommended that teachers in Elementary Schools make more use of Wordwall in teaching and learning activities, especially in subjects that have abstract concepts, such as Natural and Social Sciences (IPAS). In addition, training for teachers on the use of digital media in learning needs to be improved so that the implementation of Wordwall can be more optimal. Further studies are also recommended to explore the long-term impact of Wordwall use on students' critical thinking skills and creativity.

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