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DEVELOPMENT OF APPLICATION-BASED WORD WALL GAME MEDIA ON NATURAL SCIENCE SUBJECTS FOR ELEMENTARY SCHOOL STUDENTS

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Abstract
In the industrial era 4.0 at this time, the use of technology in the education aspect, by being applied to learning media, tends to be less than optimal where there are still teachers who do not use learning media by utilizing technology in the teaching and learning process. Teachers only use conventional learning media by using textbooks as learning media, so learning tends to be boring and less optimal. This study aims to develop Word Wall learning media and to determine the feasibility of Word Wall media in improving learning outcomes of Natural Sciences in grade V Elementary School. This study uses Research and Development (R&D) research methods, with the ADDIE model using five steps 1. Analysis 2. Design 3. Development 4. Implementation 5. Evaluate. This research was conducted at SDN Kemayoran 07 Pagi, Central Jakarta. They collected the information and data needed by distributing questionnaires to media experts in the form of 20 questions, material experts in the form of 17 questions and education experts in the form of 15 questions. The validation results from the experts in this study found that media expert validation was categorized as "very feasible", material expert validation was "very feasible", and educational expert validation was categorized as "very feasible". Furthermore, small and large group trials were categorized as "very feasible". So it can be concluded in this study that Word Wall learning media is very feasible in improving student learning outcomes in the subject of science Natural knowledge grade V elementary school.
Keywords: *Learning Outcomes; Natural Sciences; Microsoft Sway*

Abstrak
Di era industri 4.0 pada saat ini pemanfaatan teknologi pada aspek Pendidikan, dengan diaplikasikan pada media pembelajaran cenderung masih kurang maksimal dimana guru masih ada yang tidak mengunakan media pembelajaran dengan memanfaatkan teknologi pada proses belajar mengajar. Guru hanya mengunakan media pembelajaran yang konvensional dengan mengunakan buku pelajaran sebagai media pembelajaran sehingga pembelajaran cenderung membosankan dan kurang makimal. Penelitian ini bertujuan untuk mengembangkan media pembelajaran Word Wall serta untuk mengetahui kelayakan dari media Word Wall dalam meningkatkan hasil belajar Ilmu Pengetahuan Alam kelas V Sekolah Dasar. Penelitian ini mengunakan metode penelitian *Research and Development* (R&D), dengan model ADDIE mengunakan lima Langkah 1. *Analysis 2. Design 3. Development 4. Implementation 5. Evaluate.* Penelitian ini dilakukan di SDN Kemayoran 07 Pagi Jakarta Pusat. Pengumpulan informasi dan data yang dibutuhkan dengan menyebarkan angket kepada ahli media berupa 20 soal, ahli materi berupa 17 soal dan ahli Pendidikan berupa 15 soal. Hasil validasi dari para ahlli pada penelitian ini mendapatkan, validasi ahli media dikategorikan "sangat layak", validasi ahli materi "sangat layak" serta validasi ahli Pendidikan dikategorikan "sangat layak". Selanjutnya dilakukan uji coba kelompok kecil dan kelompok besar dengan dikategorikan "sangat layak". Maka dapat disimpulkan dalam penelitian ini media pembelajaran Word Wall sangat layak dalam meningkatkan hasil belajar siswa pada mata pekajaran Ilmu Pengetahuan Alam kelas V sekolah dasar.
Kata Kunci: Hasil Belajar; Ilmu Pengetahuan Alam; Microsoft Sway

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Introduction

Changes in times that continue to develop forward have entered the industrial era 4.0 at this time, with the development of science and technology that has penetrated all aspects of life, one of which is the aspect of education (Trisyanti & Prasetyo, 2018). Education is used to develop and optimize life well (Fauzan Juliansyah, 2022). The development of science and technology has an impact on education. Teachers must survive the changes of this era by utilizing technology as a medium in carrying out the teaching and learning process at school. This is also useful for teachers to make it easier to convey learning to students, especially in science subjects (Syamsuar & Reflianto, 2018).

Natural Science learning is one of the essential subjects in Elementary School because Natural Science is learning that studies all of nature and its contents systematically (Mawaddah et al., 2022). This makes learning Natural Sciences difficult for students because this subject requires reasoning, understanding, strong memory and the ability to count (Wahyu et al., 2020).

Based on observations and interviews conducted by researchers, it is known that there are still many students who find it challenging to understand Natural Science subjects because the learning received is still monotonous and tends to be boring. The teacher only refers to Natural Science textbooks so that student success in reasoning, understanding and knowing subjects tends to be lacking.

The development of science and technology can facilitate teachers in learning science by utilizing technology-based learning media to help teachers explain or convey material and information to students. (Purnasari & Sadewo, 2020). The use of learning media, learning will tend to be fun and can make students motivated and focused on learning. In achieving success in learning, Natural Sciences must improve understanding, reasoning, memory and numeracy as the primary key to learning, so learning media that is fun, efficient and effective in learning in the classroom is needed. One of the learning media that can be used in the use of technology is Word Wall learning media (Lestari et al., 2022).

The learning media to be developed in this research is "Word Wall learning media". Word Wall learning media is a game-based learning media that utilize technology in teaching and learning. This media can be used anytime, not necessarily in school, because students can access Word Wall anytime as long as they have an internet connection (Joon Woei et al., 2021). Word Wall learning media development aims to assist teachers in making effective, efficient and enjoyable learning in the teaching and learning process. It impacts increasing students' reasoning, understanding and memory, especially in Science subjects (Halimah et al., 2019).

Research Methods

This study uses qualitative research methods with the Research and Development (R&D) model by using the ADDIE type at five stages (analysis, design, development, implementation and evaluation) (Dalimunthe et al., 2021). This research is a learning media development that aims to produce or update a product by measuring or assessing media experts, material experts and education experts (Zulvira, 2022). The product produced by researchers is to develop technology-based Word Wall learning media to increase student understanding in grade V Natural Science subjects.

The necessary data collection is carried out using observation, interviews and distributing questionnaires (Khairani, 2021). Observations were made at one of the schools to be studied, and interviews were conducted with grade V teachers and students about learning natural sciences. Questionnaires were distributed to experts, media experts, material experts and education experts and then; tested the resulting product.

Product trials were carried out on grade v students by dividing into two groups, small groups and large groups, small groups containing five students and large groups containing ten students. This aims to determine the effectiveness, efficiency and enjoyment of this Word Wall learning media in learning science in grade V Elementary School use learning media in the classroom (Zulvira, 2022).

To determine the feasibility of the technology-based Word Wall learning media developed, there are 5 stages that researchers must do, namely: 1) The analysis stage, at this stage the researcher conducts an analysis of the problems that exist in the school and solves the problems that exist in the school, 2) The development stage, at this stage the researcher carries out a product design that will be developed in the form of developing technology-based Word Wall learning media and conducting feasibility tests on experts, 3) Development stage, this third stage performs a reallization at the previous stage which will become a learning media that will be used in solving existing problems in the teaching and learning process, 4) Implementation Stage, the next stage is to implement the products that have been produced such as technology-based Word Wall learning media to students in actual situations that exist in schools or outside schools, with the aim of knowing how far the effectiveness of the learning media being developed, 5) Evaluate stage, this stage is the final stage of this research by evaluating technology-based Word Wall learning media by perfecting the shortcomings that exist in this development based on the suggestions of experts and the facts in the use of learning media to students. If the product has not been said to be feasible, it must be improved with existing deficiencies. If the product has improved, the product can be disseminated to the public as a creative, innovative and fun learning media (Ofosu-Asare et al., 2019).

Results and Discussion

This research is Research and Development (R&D). Which is used to create and develop a product. Test the effectiveness of the product that has been made. The product that researchers have developed is technology-based Word Wall learning media using the ADDIE model with five stages that must be done as follows:

Analysis Stage

The first stage carried out in this study was to conduct an observation and interview of the learning process of Natural Science class V Elementary School. Based on the results of researchers, researchers found that learning Natural Sciences in the classroom is still lacking in the use of technology with the application of learning media. This is because teachers only use conventional learning media by utilizing teacher books in the classroom. So learning in the classroom tends to look dull, and lack of student response in focusing on receiving learning material in the classroom, which impacts the lack of understanding of student learning. Therefore, researchers try to provide a solution to learning by using technology-based Word Wall learning media as a fun learning media and can facilitate teachers in conveying information to students so that learning in the classroom can be fun by playing while learning. Based on the results of interviews conducted by researchers with teachers of SDN Kemayoran 07 morning, it was found that teachers more often use textbooks as learning media in the classroom. Lack of utilizing technology to facilitate learning in the classroom so that learning in the classroom is less effective. It was also found that students find it challenging to accept Natural Science learning material.

Design Stage

Researchers design that will be used on word wall learning media by making several sketches of a logo as an initial appearance. Determining themes are suitable for the use of learning media in class V. Making the material to be used, and then the researcher makes changes. This was previously in the form of a web application that students could download so that this learning media could give a good impression to students by learning while playing in science.

Development Stage

At this stage, the development of existing learning media is carried out through several stages: First, enter a logo that has been determined from several logos that have been made and the initial appearance of the Word Wall learning media. Second, enter the Natural Science material into the Word Wall learning media that has been made before. Third, choose a theme or template for this learning media by choosing a maze chase theme with the theme of learning while playing. Fourth, make a system change to the Word Wall learning media so it can be used on Hndphone in Landscape or portrait mode. Fifth, make system changes by making this Word Wall learning media which was initially web-based, into learning media in the form of an application. Sixth, experiment with whether this application can be downloaded and accessed by others.

With the completion of this stage in the development of learning media, researchers must then assess the feasibility and ask for criticism and suggestions from the learning media being developed by conducting a validation test conducted by three experts, media experts, material experts and education experts. The validation test conducted by Mr Bayu Thomi, a media expert, said that "this learning media is quite creative and innovative, but instructions must be made before the learning media game starts, and the questions must be easy to understand to answer". The results received from media experts are categorized as "very feasible" by getting an average percentage of 83.8%.

Table 1. Media Expert Score

Validator Name	Score Obtained	Maximal Score	Average Percentage
Bayu Thomi Rizal, M.Pd	67	80	83,8%

Mrs Atik conducted material expert validation to determine the feasibility of using the material used by looking at the essential competencies and indicators in Natural Science and to provide a meaningful suggestion or criticism on the smooth use of material on the learning media developed. (Zakiy et al., 2018). It is known that the results received by material experts get an average percentage of 94% with the category "very feasible".

Table 2. Material Expert Score

Validator Name	Score Obtained	Maximal Score	Average Percentage
Atik Diantika, S.Pd.SD	64	68	94%

Then the last one conducts an assessment or validation of Word Wall learning media to Education experts to determine the feasibility of learning media that will be used during the teaching and learning process in schools. (Rahmi et al., 2019). Expert validation of this media expert was carried out by the teacher concerned as the homeroom teacher at SDN Kemayoran 07 Pagi, with Mrs Dita Gustiana as the education expert selected. The results obtained from the

validation of education experts are with an average percentage of 96.7% categorized as "very feasible".

Table 3. Education Expert Score

Validator Name	Score Obtained	Maximal Score	Average Percentage
Dita Gustiana, S.Pd	58	60	96,7%

After validation by experts in their fields with media experts, material experts, and education experts, the effectiveness of Word Wall learning media that has been produced by carrying out the final two stages. Implementing the use of this learning media to students and evaluating all stages and results that have been obtained.

Implementation Stage

This stage is to conduct a trial of respondents of grade V students at SDN Kemayoran 07 Pagi by dividing into two groups, with a small group containing five students and a large group using ten students. This stage is carried out to determine the feasibility of learning media that has been made by looking at criticism, suggestions and responses received by researchers. The average percentage for trials conducted on small groups was 94% with the category "very feasible".

Table 4. Small Group Trial

Student Respondent	Score (Max 50)	Percentage	Feasibility
1	48	96%	Very Good
1	47	94%	Very Good
3	47	94%	Very Good
4	46	92%	Very Good
5	47	94%	Very Good
Average	238/250	94%	Very Good

After conducting a small group, the researchers continued the trial to the large group with ten students. The results obtained in the large group trial obtained an average percentage of 95.2% with the category "very feasible". This trial was also to determine the product's efficiency, effectiveness, and feasibility.

Table 5. Big Group Trial

Student Respondent	Score (Max 50)	Percentage	Feasibility
1	49	98%	Very Good
1	47	94%	Very Good
3	47	94%	Very Good
4	47	94%	Very Good
5	47	94%	Very Good
6	47	94%	Very Good
7	47	94%	Very Good
8	48	96%	Very Good
9	48	96%	Very Good
10	49	98%	Very Good
Average	476/500	95,2%	Very Good

Based on the results of validation conducted by student respondents divided into small groups and large groups. The results are satisfactory with the categorization of Technology-based Word learning media as "very feasible". It to be used as learning media in adding students' learning understanding of Natural Science subjects. Making learning fun by doing play activities while learning on this learning media so that students look enthusiastic and not bored in the learning. That is being carried out during the teaching and learning process in schools.

Evaluation Stage

The last stage that must be done is to conduct an evaluation of Word Wall learning media from various suggestions and criticisms received by researchers. Both from severe experts and from student respondents, by making an improvement from the shortcomings of this Word Wall learning media. After all, suggestions and criticisms have been fulfilled, this Word Wall learning media can be disseminated to the general public as a learning media. That adds to students' understanding of learning, especially Natural Sciences. researchers hope that this media development can be helpful for others in making it easier to convey material to students and make learning fun (Harjanta & Herlambang, 2018).

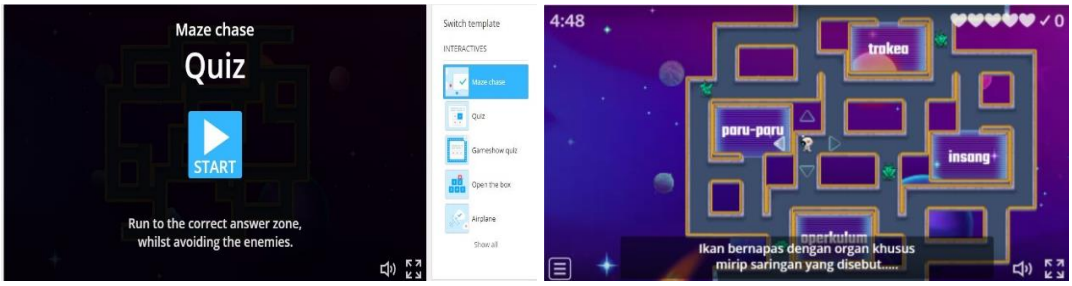

Figure 1. Word Wall Media

Conclusion

Based on the explanation of the previous discussion, from the results of experts, media experts, material experts and education experts and questionnaires distributed to small groups and large groups on the development of technology-based Word Wall learning media in Science subjects grade V Elementary School. So it can be concluded that technology-based Word Wall learning media is categorized as "very feasible" to be used to improve student understanding of Natural Science subjects for Grade V elementary school students. Researchers hope that the learning media that has been developed can be utilized by teachers and parents, especially in Natural Science subjects.

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