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Development of Interactive Learning Media with Wordwall to Enhance Student Interest and Understanding in Class X Geography

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Abstract

This research aims to develop word wall-based learning media and determine students' learning interests. Moreover, determines students' understanding of remote-sensing material. The research subjects were 33 class X 3 students, one lecturer as a content expert validator, and one as a media expert validator. The research method used is Research and Development (R&D), which concerns the simplified Borg & Gall steps. The research instrument was an Observation sheet, interview, and questionnaire. The research results show that Wordwall-based learning media positively contributes to students' interest in learning. This is demonstrated by an increase in students' comprehension scores after using the press. Apart from that, students' interest in learning about remote sensing material is in a good category, namely high interest. The research results show that Wordwall-based learning media is suitable for use as an alternative innovation in the geography learning process. This research concludes that Wordwall-based learning media effectively increases students' interest and understanding of remote sensing material. This media can be a reference for teachers to create more interactive and interesting learning. This research also recommends further development to integrate other digital learning media into teaching and learning.

Keywords: Learning Media, Wordwall, Interest in Learning, Understanding, Geography, Remote Sensing

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1. Introduction

The development of science and technology in the era of globalization requires comprehensive renewal in life, especially in education, which is necessary to improve human resources to compete globally. Along with increasing demands for the quality of

education, the professionalism of educators has also become a discourse in the world of education today. Teachers are the main pillars who interact directly with students in learning. One of the requirements for a quality teacher is a teacher with pedagogical competence. Pedagogical competence is the ability to manage students, namely, educational learning, in a dialogic and interactive atmosphere so that learning becomes active, innovative, creative, effective, and fun (Sentani et al., 2022).

In the learning process, the teacher's role is to provide, show, guide, and motivate students so that they can interact with various existing learning resources. Not only learning sources in the form of people but also other learning sources. Learning resources are deliberately designed not only for learning purposes but also as learning resources available. We can find all these learning resources, choose them, and use them for our students. Other learning sources can include media. Media is a communication tool; some say it is an intermediary tool, so it can be concluded that media is an intermediary between message transmitters and recipients (Rusman, 2019).

If we look at its development, media was initially only considered a teaching aid for teachers. The tools used are visual aids, for example, pictures, models, objects, and other tools that can provide concrete experience, motivation to learn, and increase students' learning absorption and retention. Unfortunately, because they focus too much attention on the visual aids they use, people pay less attention to aspects of design, learning development, production, and evaluation. With the influence of audio technology around the middle of the 20th century, visual tools to concretize these teachings were equipped with audio tools so that we know about audio-visual tools or audio-visual aids (AVA) (Sukiman, 2019).

Teachers and learning media are closely related in activities encouraging active, creative, effective, and enjoyable indirect and multimedia-based learning (Alifa, 2021). Even though learning media plays an important role in implementing education in schools, there are still challenges or problems with its availability. Teachers must create learning media to guide their students because the material is too abstract. Therefore, self-developed learning media can be modified to suit the intended audience's needs (Asnawati, 2019).

Some teachers only concentrate on helping students access learning materials, even though these materials can be created from various sources and in multiple ways depending on the needs and features of the learning plan to be discussed. Teachers will find learning easier through learning media, and students will benefit more. Making your learning media smart is important if materials that meet curriculum requirements are unavailable and difficult to obtain. References for creating learning media can be found in various places, including your knowledge and experience and information obtained from experts and colleagues. However, the reason why this is a problem is because teachers consider it a very big challenge (Asnawati, 2019).

Media development carried out by geography teachers at MAN Karo is still not ideal. Because textbooks and pictures from PowerPoint are the only simple media teachers use specifically for remote sensing material. Creative use of media is still non-existent. This is caused by teachers' lack of creativity in media use. Apart from that, the media available in schools for learning is insufficient. Due to the lack of learning media in schools, students feel bored with the learning process. Students become less active and less interested in learning geography because they only use monotonous methods. Students also think less critically because teachers teach the material through lectures to explain the learning material. Teachers' methods make students less likely to discuss or

study in groups, so they only learn individually.

This problem shows that learning media has an important purpose and must be used by teachers as a technology-based teaching aid to help students understand geography subject matter, especially remote sensing material. The Wordwall application is suitable for supporting students' interest and understanding in geography learning. Remote sensing material. This application is a medium for creating interesting and creative educational quizzes and is starting to be used as a teaching aid. Therefore, students' attention will be focused on the learning process carried out in the classroom to increase their understanding of geography learning in remote sensing material.

The media developed in this research is an application or web called wordwall. The Wordwall application is an online or web program connected to the Internet and can provide various types of exercises to be presented to students (Safitri et al., 2022). In this way, students can focus on quizzes designed to be as interesting and creative as possible with various animations and features in the application. Anyone can use this program, including teachers and students. So teachers can hone their creativity by making quizzes or exercises as interesting as possible according to the learning material.

This research develops learning media using the wordwall application, emphasizing class X remote sensing material. Remote sensing material is difficult if it does not involve interactive learning. Remote sensing material has high relevance to everyday life, such as monitoring natural disasters, planning spatial planning, and environmental monitoring. Students often consider this material difficult because it is abstract and requires a good understanding of concepts. Therefore, using interactive media can help visualize remote sensing data to make it easier for students to understand. This research is very important to carry out because there is a need to develop innovative learning media and attract students' interest in studying remote sensing material. Wordwall, as an interactive learning medium, is expected to increase students' interest in learning, make it easier to understand complex concepts, and help them overcome challenges that may be faced in learning geography at MAN Karo. Thus, this research can improve the quality of Geography learning and prepare students to face challenges in the digital era.

2. Method

The test subjects of this research were 33 students in class X-3 at MAN Karo. The research method used is Research and Development (R&D), which concerns the simplified Borg & Gall steps. The steps are as follows:

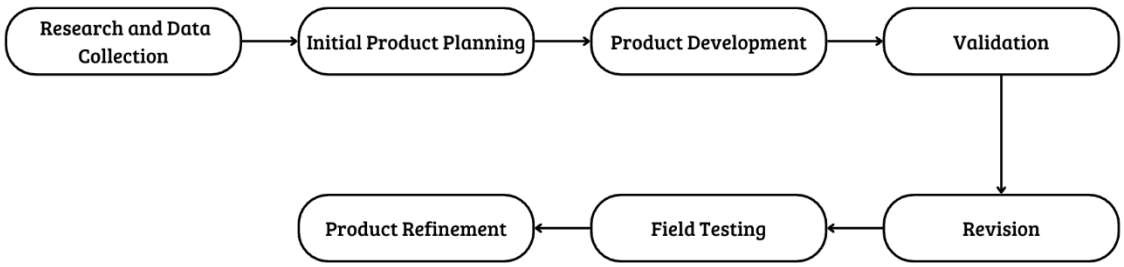


Figure 1. Research Stages

The data collection techniques in this study consist of four stages. The first stage is observation, where the researcher directly visits the research site. The second stage is testing, in which the researcher conducts two tests—pre-test and post-test—to determine

the extent of students' understanding before and after using the Wordwall application. The third stage uses questionnaires, including validation questionnaires from media and material experts, to assess the feasibility of the media designed by the researcher. The fourth stage is a documentary study, which utilizes learning modules, lesson plans (ATP), and relevant books for geography lessons on remote sensing material.

The data analysis techniques used in this research are qualitative and quantitative. Qualitative data in the form of criticism and suggestions provided by material experts and media experts to evaluate deficiencies in the media that have been developed. Next, the data is analyzed and used to determine the feasibility of wordwall media. Quantitative data was obtained from questionnaire scoring based on material experts, media experts, expertise, and student understanding.

Analysis sheet data from material and media experts was examined using percentage methodology to provide descriptive and qualitative analysis. The following formula is used to get the percentage from the validation sheet:

$$\text{Percentage (\%)} = \frac{\text{Score obtained}}{\text{Score maximum}} x100\% \quad (1)$$

The value of the resulting learning media is confirmed after calculating and knowing the percentage of results. The validation results of learning media created using the Wordwall application are shown in the table below:

Table 1. Media And Material Expert Validation Score Criteria

Information	Percentage Interval
Very Unworthy	0% - 20%
Not Feasible	21% – 40%
Quite Decent	41% - 60%
Worthy	61% - 80%
Very Worthy	81% - 100%

Source: Supriyaddin et al. (2020)

A formula calculates the percentage of student responses, and then matching is carried out with criteria developed based on student responses.

$$\text{Class Average} = \frac{\text{Total score of all students}}{\text{Total number of students}} \quad (2)$$

The resulting interest value is confirmed after calculating and knowing the total results. The total interest criteria that have been added up are shown in the table below.

Table 2. Criteria For Student Learning Interest Scores

Value Range	Information
0 – 39	Very Low Interest
40 – 54	Low Interest
55 – 69	Moderate Interest
70 – 84	High Interest
85 – 100	Very High Interest

Source: Kamaruddin (2023)

The tests carried out in this research were pre-tests and post-tests to measure class understanding. After answering the pre-test and post-test, the score from the student's answers can be calculated using the following formula to determine student understanding:

$$\text{Understanding Value} = \frac{\text{Number of questions answered correctly}}{\text{Total Questions}} x100 \quad (3)$$

The average comprehension score for all students is determined using the following formula (Ningtias et al., 2023).:

$$\text{Student Average Score} = \frac{\text{Total scores obtained by students}}{\text{Total number of students}} x100 \quad (4)$$

3. Results and Discussion

A. Results

This research is a type of research and development (R&D) carried out using the Borg & Gall development model, which consists of 10 stages and is simplified into seven stages. By the Borg & Gall development model, the steps for developing quiz learning media using the wordwall application start from research and data collection, initial product planning, product development, validation, revision, field trials, and product refinement. Assessment of internal needs developing a learning product is the first and most important thing in developing learning products (Pangestu et al., 2021). According to this Hasan et al. (2021), so that learning information can be understood effectively and efficiently, learning media can act as a mediator between teachers and students. This research results in a quiz learning media product using the wordwall application on remote sensing material, which was implemented in class X IPS 3 MAN Karo.

Researchers conducted initial research and collected information through initial observations at MAN Karo. Researchers observed that the learning process in class X IPS 3 was still far from ideal. Packaged books, PowerPoint presentations, and pictures are usually the only simple media teachers use. The use of creative media is still non-existent. This is caused by the teacher's lack of media proficiency. Apart from that, the media available in schools for learning is insufficient. This is not the opinion of Suhailah et al. 2021, which states that teachers should not be the only source of learning. However, as facilitators, teachers must also be able to plan and create other learning resources to create a conducive learning environment. Then, in the learning process, the teacher uses a student center where the teacher does not act as a learning center but as a facilitator, guide, or innovator.

At this stage, quiz-based learning media product planning uses the wordwall application. The initial step in creating this media planning stage is to create a Teaching Module for remote sensing material, determine the design or display of the quiz, such as writing format and layout, and then create quiz questions on the material that you want to display in the media sourced from the class X geography book of the independent curriculum or other sources. Other relevant. In data collection, researchers collect various data to facilitate product creation Flow of Learning Objectives (ATP) and Remote Sensing teaching modules for Class X SMA/MA Independent Curriculum, books about Remote Sensing material for Class X SMA/MA Independent Curriculum, books about

the development of learning media and scientific work about media development using the wordwall application.

This research uses a type of quiz called "Open the Box." This type of quiz displays several numbered boxes in which there are pre-designed home selection questions. The following is the quiz design that will be used in this research.

Figure 2. Instruction Display

Figure 3. Front View

Figure 4. Display Questions

After the media is designed, the next step is the material and media experts' validation stage. The material expert in developing quiz-based media using the wordwall application is Mr Sendi Permana, S.Pd., M.Sc., who is one of the lecturers in the FIS

geography education department at Medan State's University, was appointed as a material expert validator because he had taught high school/MA level geography subjects which were by the material in quiz-based media using the developed wordwall.

Table 3. Assessment by Material Experts

No	Validator	Assessment Aspect			
		Presentation	Content Quality	Construction	Use
1	Sendi Permana, S.Pd., M.Sc.	38	26	13	
	Total Score		86		
	Eligibility Level		86 % (Very Worthy)		

Source: Primary Data Processing 2024

The media expert in developing quiz-based media using the wordwall application is Mr. Syukri Hidayat, M.Kom, who is a lecturer in the geography education department at FIS, Medan State's University, designated as a media expert validator because he understands media very well and teaches geography learning media courses. Based on an assessment by media expert validators, quiz-based media using the wordwall application on remote sensing material received a score of 86%, which fell into the "Very Appropriate" category with suggestions for improvement from media experts.

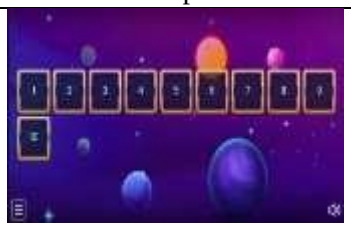
Table 4. Assessment by Design Experts

No	Validator	Assessment Aspect			
		Presentation	Content Quality	Construction	Use
1	Syukri Hidayat, M.Kom	26	21	22	17
	Total Score		86		
	Eligibility Level		86 % (Very Worthy)		

Source: Primary Data Processing 2024

The revision directions given by material experts and media experts are in the table below:

Table 3. Design Revision

Repair	Before Repair	After Repair
The box on the front view is tidied		

Add picture Questions	

Source: Primary Data Processing 2024

The research subjects in the field trial involved all 33 class X IPS 3 students. The field trial aims to determine students' interest in learning and understanding quiz-based media using the wordwall application that has been displayed. The field trial assessment was carried out by the researcher first providing pre-test questions to measure students' understanding before using the wordwall application. Based on the results of pre-tests carried out in field trials, there is an average score for student learning outcomes before using the Wordwall application, namely 44.2, which is a very low score and far from the kkm for geography subjects, namely 75.

After carrying out the pre-test, all X IPS 3 students received a little lesson from the researcher and continued using the wordwall application on the remote sensing material. Then, after completing the quiz, students are given a post-test to find out and compare students' understanding before and after using the wordwall application. Based on the results of posttests that have been carried out in field trials, there is an average value of student learning outcomes after using the Wordwall application, namely 87.8, where this value has increased from the average value of student learning outcomes before using the Wordwall application, namely 44.2 and has reached the kkm in geography subjects, namely 75.

After carrying out the pre-test and post-test, the researcher gave students response instruments to assess students' interest in learning after using wordwall media in remote sensing material. Based on the results of student responses in group trials regarding students' interest in learning using the wordwall application in remote sensing material, they received an average score of 84.63. So, students' interest in learning using the wordwall application in remote sensing material based on student responses is 84.63. falls into the "high interest" category. After conducting group trials, the final stage of this research is product refinement. Based on the researcher's observations in the field trial, student complaints made the researcher slightly revise the quiz display on the wordwall application regarding remote sensing material. The complaint from class.

B. Discussion

1. Effectiveness of Using Quiz-Based Wordwall Learning Media in Enhancing Students' Understanding

This research shows that quiz-based learning media with the Wordwall application significantly improves students' understanding of remote-sensing material. This is evidenced by the difference in the average learning outcome scores before and after using Wordwall, where the pre-test score was only 44.2, far below the passing standard (KKM) of 75, while the post-test score increased to 87.8. This improvement indicates that Wordwall, as an interactive quiz-based learning media, helps students grasp concepts more effectively than conventional methods such as textbooks and PowerPoint presentations. These findings align with research Hidayat et al. (2023) that digital quiz-based learning media can significantly enhance students' learning outcomes. In that

research, students who used digital quiz media showed a higher understanding of the material than those who relied solely on lecture methods. These findings confirm that integrating technology into learning, particularly interactive quizzes can enhance student engagement and material comprehension.

Furthermore, research Nurholifah et al. (2023) also shows that game-based or interactive quiz learning media can create a more engaging and conducive learning environment. They found that students learning through quiz-based methods tended to be more motivated, focused on the material longer, and retained information better than those learning through conventional methods. This indicates that technology-based media not only serve as learning aids but also as strategic tools for improving the quality of education.

Wordwall helps students understand abstract concepts that are difficult to grasp in remote sensing learning through books or lectures alone. Interactive quizzes enable students to test their understanding directly, receive instant feedback, and stay motivated to learn more actively. Research Panggabean & Hidayat (2022) supports these findings, stating that teachers should not be the sole source of learning. Facilitators must provide various resources and learning methods to help students develop their understanding independently.

Apart from improving comprehension, this research also found that using Wordwall positively impacts students' interest in learning. Based on students' responses, their average interest score increased to 84.63, which falls into the "high interest" category. This suggests students felt more engaged and enjoyed the learning process more with quiz-based methods than with traditional approaches. Research Ridwana et al. (2022) also indicates that interactive media in geography learning can significantly boost students' interest and engagement, ultimately leading to better learning outcomes.

2. Students' Interest and Responses to Wordwall Learning Media

Besides improving understanding, this research also measured students' interest levels using Wordwall as a learning medium. Based on students' responses to quiz-based Wordwall, the average score obtained was 84.63, which falls into the "high interest" category. This indicates that integrating technology into learning can enhance students' motivation, create a more engaging learning atmosphere, and reduce boredom when understanding previously perceived difficult subjects. These findings align with the concept of technology-based learning, which emphasizes the importance of student interaction and engagement in the learning process to improve overall academic achievement.

Similar research Andarto et al. (2024) also found that interactive learning media, such as digital quizzes and educational games, increase students' learning interest. In their study, interactive media students reported a more enjoyable learning experience than conventional lecture methods. These findings suggest that students' involvement in technology-based learning significantly influences their learning interests and motivation. Additionally, research Pratama et al. (2021) found that using interactive media in geography learning helps students stay more focused and enthusiastic in understanding abstract concepts. The gamification element in learning encourages students to complete challenges in quizzes, which indirectly enhances their comprehension of the subject matter. Wordwall-based quizzes provide students with a more tangible and interactive learning experience in remote sensing, which involves highly abstract concepts.

However, during field trials, several challenges were identified in implementing

Wordwall, including adjusting the quiz display to make it more user-friendly for students. Some students reported that the interface was too simplistic and less engaging, while others desired more variety in question formats to prevent monotony. These findings indicate that while interactive media can enhance learning interest, the design and presentation of quizzes must be carefully considered to match students' preferences and needs. To address these challenges, the final stage of this research involved refining the product based on student feedback. Improvements included adjusting the quiz interface, varying question types, and optimizing interactive features to make the learning experience more engaging and user-friendly. This approach aligns with research Nofriyandi et al. (2021) recommendations, which suggest that learning media development should be continuously refined based on student responses and needs to enhance learning effectiveness.

4. Conclusion

The development of quiz learning media using the word wall application on remote sensing material using development research (R&D) has been developed using research steps. It can be used as a learning media, especially in geography subjects. The feasibility of quiz learning media using the wordwall application is determined by the assessment of material expert lecturers and media experts. The assessment by media experts received a feasibility level of 86, which fell into the very feasible category after revisions were carried out. Meanwhile, the evaluation by material experts received a feasibility level of 86, which is a very feasible category after carrying out revisions. Students' responses to their interest in learning using the wordwall application in the field trial received a total score of 84.63 in the high-interest category. Students' understanding before and after using the wordwall application is carried out in a field trial using pre-test and post-test learning scores. In the field trial, students' understanding of the pre-test was 44.2, and after using the wordwall application in learning, students' experience with the post-test increased to 87.8.

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