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DEVELOPMENT OF POWERPOINT MACRO & PREZI BASED SCIENCE LEARNING MEDIA FOR CLASS V ELEMENTARY SCHOOL

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Abstract
This research and development aims to evaluate the feasibility of using PowerPoint Macro and Prezi-based learning media in Natural Sciences learning for fifth grade elementary school students in the 2022/2023 academic year. The research method used is the Dick & Carey research and development (R&D) model. The steps involve needs analysis, learning analysis, behavior analysis and initial characteristics of students, preparation of specific learning objectives, development of research instruments, learning strategies, media development, formative design and evaluation, learning revision, and summative evaluation. This research combines qualitative and quantitative data, analyzed using the validity test, practicality test, and Wilcoxon test. The research results show that the development of learning media based on PowerPoint Macro and Prezi provides positive results. This media is a digital learning product specifically designed to support teachers and students in science learning activities with KD 3.3. The results of the validity test by three experts show a high level of feasibility. The practicality of this media, assessed by students, also showed a high percentage during individual and small group trials. Apart from that, this learning media has proven to be effective in significantly improving student learning outcomes, as seen from the Wilcoxon test which indicates a significant difference between the two samples. Thus, it can be concluded that PowerPoint Macro and Prezi based learning media are very suitable and effective for use in grade V elementary school science learning.

Keywords: *Effectiveness, Feasibility, Learning Media.*

INTRODUCTION

Education is a need that cannot be separated from human life. In this increasingly modern era, education is an asset that we need to meet the demands of the times. The educational factor has a big impact on the progress of a nation. When education in a country is of good quality, this will create superior human resources in terms of spirituality, intelligence and skills, which in turn play an important role as the nation's next generation. Education is considered the main foundation in forming the character and abilities of the younger generation. On the other hand, if the results of the educational process fail, it will be difficult for a nation to achieve progress.

Connected to the concept of education, learning or teaching reflects three types of learning: formal, non-formal, and informal, as regulated by National Education Law no. 20 of 2003. In this context, learning is explained as the interaction between students, teachers, and learning resources in a learning environment. Therefore, the quality of education has direct implications on the effectiveness of the teaching and learning process and ultimately on the progress of the nation.

The learning environment is not only limited to the physical classroom, but also includes various places that facilitate the teaching and learning process. In this process, knowledge transfer occurs through the exchange of information between teachers and students. It is important for teachers to have a good personality and be a role model for students, remembering that the basic meaning of the word "teacher" is "one who is followed and imitated". Effective communication between teachers and students during the learning process is necessary to improve a country's education system. One strategy to achieve this is to use various types of learning media in each session, aiming to increase students' learning motivation. Therefore, the role of teachers and students is very crucial in achieving success in the education system.

To achieve educational goals, several supporting factors are needed, and one of them is the subjects taught in each educational institution. Currently, educational institutions have adapted their curricula to the 2013 Curriculum, which emphasizes active learning. Learning materials in elementary schools are designed and arranged according to the characteristics and developmental stages of students based on their age. According to Piaget's theory, there are four stages of development of thinking in children, namely the sensorimotor stage (0-2 years), the preoperational stage (2-7 years), the concrete operational stage (7-11 years), and the formal operational stage (12-15 years) (Sugihartono, 2007). The growth of children's thinking does not follow a linear pattern and each child can experience different stages of development. These stages provide a general

framework for understanding how children's cognitive skills develop as they age and experience.

The learning process is a system consisting of components that are interrelated and interact with each other. According to Winarno Surakhmat in (Suyanto & Hisyam, 2000) the teaching and learning process is essentially an educational process and there are seven components in it, namely, (1) clear objectives to be achieved, (2) the existence of teaching materials or learning media, (3) students who active, (4) teachers who teach, (5) learning methods to achieve goals, (6) interaction processes, and (7) evaluation or assessment.

Sulistyorini, (2007) states that science learning should involve all student activities (active learning), with teachers able to apply learning that allows students to develop process skills such as searching, finding, deciding, communicating, evaluating and using experience. De Vito, et al. in Samatowa, (2006) states that "science learning must be integrated into students' daily lives so that science education is effective. Students get the opportunity to improve their skills, increase their level of curiosity about their environment, ask questions, generate ideas, and become more aware of science learning." In order for students to understand the relevance and real-world application of what they learn, effective science education also incorporates science topics into the context of students' daily lives. A greater understanding of science is only possible through the collaboration of students, they share knowledge, discuss and work together. In addition, the use of technology and multimedia resources is an important element in effective science learning because it allows students to engage visually and dynamically with scientific concepts. Effective science lessons also use periodic formative assessments to check student understanding and provide useful criticism. With this strategy, good science teaching can foster students' interest and motivation towards science, as well as a deep understanding.

Science learning involves an interactive process of students gaining understanding and exploring scientific concepts about the universe, the environment and natural phenomena. In this learning, students are encouraged to develop conceptual understanding, critical thinking skills, observation and experimentation through the use of relevant methods, practices and learning resources. Science subjects cover topics such as physics, chemistry, biology, and the environment. The main goal of science learning is to develop students' understanding of scientific principles, critical thinking skills, observation, experimentation, as well as the ability to analyze and solve problems. In this learning, students are given the opportunity to observe natural phenomena, conduct experiments, collect data, and generalize the information obtained.

Through science learning, students are expected to develop curiosity, the ability to think logically, and awareness of the importance of science and technology in everyday life.

However, it was found that even though various media and adequate teaching materials are available in schools, the learning process often only relies on whiteboards, markers, student books and teacher's books from the government as learning media. This causes a decrease in students' interest in learning and they experience difficulties in understanding the material, especially in class V science subjects about the human digestive system. Only some students really understand the material presented, while others still experience difficulties, so student learning outcomes are still low and many have not reached the minimum graduation criteria or KKM. Limited use of learning media is the main factor causing this.

Efforts were made to find solutions in developing appropriate learning media according to the needs of teachers and students. This is done through needs analysis which involves interviews and distributing questionnaires to teachers and students. In this case, the desired learning media is digital or technology-based media. (Tafonao, 2018) states that in the current educational context, it is important for educators to understand and use learning media effectively. Learning media has an important role in facilitating communication between educators and students, as well as helping students understand the material being taught. Thus, learning media becomes a tool used in the learning process to stimulate students' creativity, interest, attention, and abilities and skills. Learning media is designed by teachers as a means that makes it easier to convey material when teaching. This really helps teachers in teaching and is a solution to make students feel happy and not bored while learning.

RESEARCH METHODOLOGY

This research uses the Research and development (R&D) method. Sugiyono, (2009) said, research and development aims to create and produce special products and test the effectiveness of these products. This research method is used in the development of new products or technology to ensure that the product or technology can meet user needs and is effective in achieving its intended use.

This research uses the Dick & Carey RnD model design which consists of 10 steps which have been chosen as the approach in this research and development, namely: 1) Needs analysis, 2) Carrying out learning analysis, 3) Analyzing the behavior and initial characteristics of students, 4) Developing specific learning objectives, 5) Developing research instruments, 6) Creating

learning strategies, 7) Developing and writing media, 8) Designing and conducting formative evaluations of learning, 9) Revising learning, and 10) Making summative evaluations... As for Dick & Carey RnD model design drawing, as follows:

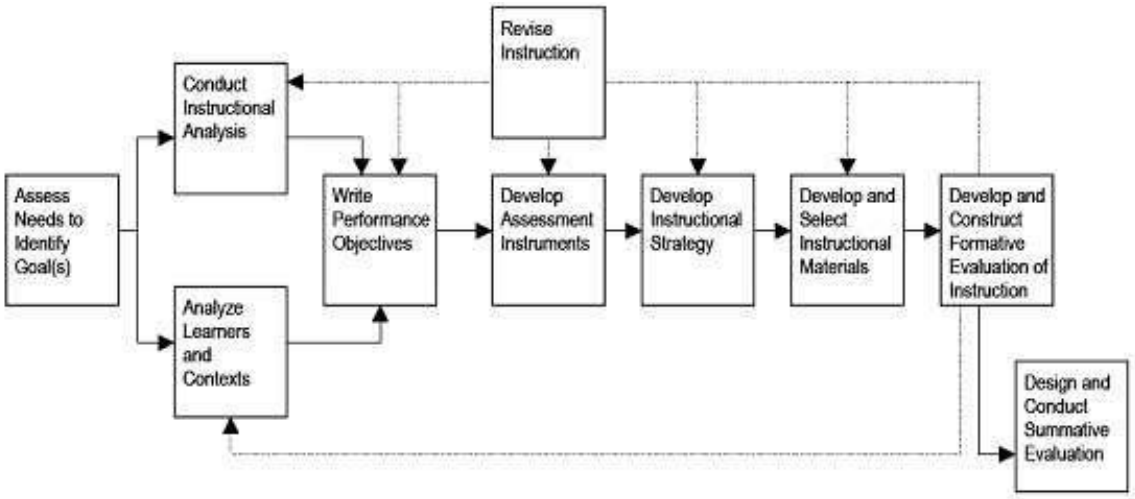


Figure 1. Dick & Carey RnD Design

The research was carried out in several stages, namely the preliminary study stage. This initial study used a qualitative descriptive approach to explain the process and evaluation in developing learning media based on PowerPoint Macro and Prezi. This research was conducted in two elementary schools to develop learning media based on PowerPoint Macro and Prezi as natural science learning tools on the topic of the human digestive system. The elementary schools used as places for this research are SDIT Peradaban Global Quran and MIS An-Nur which are both accredited A.

The stages of model development include the stages of needs analysis, learning analysis, analysis of student behavior and initial characteristics, developing specific learning objectives, developing research instruments, creating learning strategies, developing media, designing and conducting formative evaluation of learning, carrying out learning revisions, and evaluating summative. The development of media products in research is carried out in several stages including design validation activities, design revisions, product trials, product revisions, evaluation and refinement. Data collection techniques were carried out using interviews, questionnaires and tests. In this research, data analysis uses inferential statistical methods for quantitative data and qualitative data analysis techniques for data in narrative or descriptive form (Sugiono, 2015).

Next is the model evaluation/testing stage. The results obtained at this stage will strengthen the results of previous research. Prezi learning media is applied as a science learning tool with an emphasis on Basic Competency (KD) 3.3. material on digestive organs and their functions in animals and humans, as well as steps to maintain the health of human digestive organs. This learning media takes the form of image slide-based presentations and digital games which can be accessed by students via devices such as notebooks, laptops or computers. The Prezi application will show slides of explanatory material and pictures about the human digestive system, the PowerPoint Macro application will show a game in the form of multiple choice questions which refer to the learning objectives and each question will give rise to a different reaction if students choose the correct answer or wrong, and at the end of the game the score achieved by the student will automatically appear. Progress in using this media can be assessed through formative evaluation, while testing. The suitability of this media can be confirmed after going through a series of tests, such as validity tests, practicality tests, and formative evaluation tests (t-test) to determine whether there is a significant increase in learning outcomes.

RESULTS AND DISCUSSION

Results of Development of PowerPoint Macro & Prezi Based Learning Media

The results of identification and needs analysis show that students like learning by experiment or direct practice, want digital-based learning media, and show greater interest in learning when teachers use innovative and interesting media or teaching materials, this can increase enthusiasm and motivation for learning. they. This can be seen from the results of the questionnaire as follows:

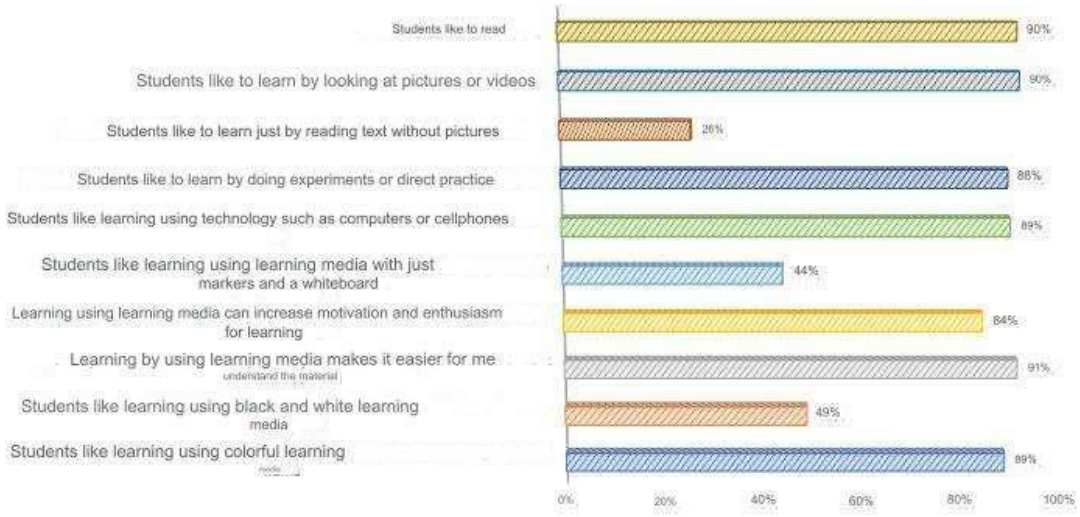


Figure 2. Results of the student needs analysis questionnaire

a. Expert Validation

The results of this research and development product have been validated by three experts who play a role in identifying weaknesses and providing feedback and suggestions. These three experts have diverse backgrounds, including expertise in materials, language and learning media. The following sections will provide a detailed explanation of improvements, feedback, and suggestions provided by experts in terms of materials, language, and media.

Table 1. Recommendations and Improvements from Material Experts

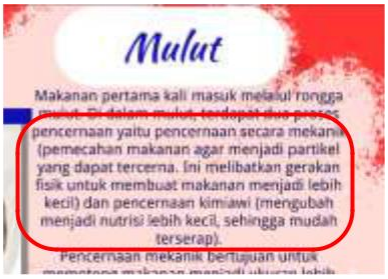
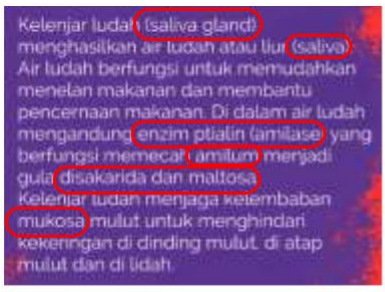
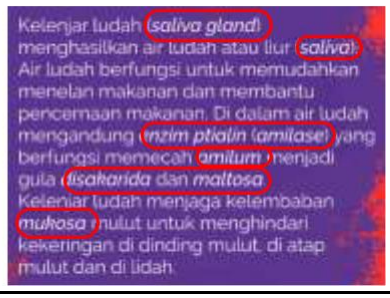
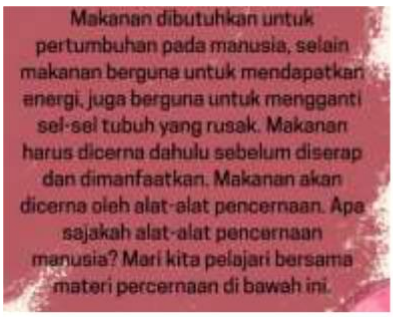
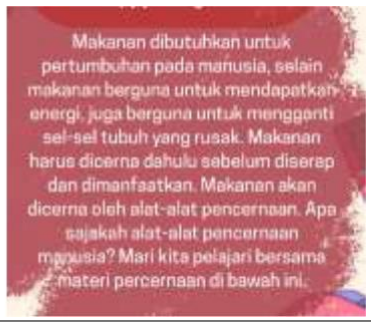
Material Expert Corrections and Suggestions	After Revision
Explanations should be written in more detail with additional explanation sentences 	Revisions are made by adding additional descriptive sentences 

Table 2. Recommendations and Improvements from Language Experts

Language Expert Corrections and Suggestions	After Revision
Scientific languages and foreign languages should be displayed in italics or italics 	Revisions are carried out by changing scientific languages and foreign languages to be displayed in italics or italics 

Capital letters should only be used on the first letter in a sentence 	Revision is done by changing the capital letter of the first letter in a sentence 

Table 3. Recommendations and Improvements from Media Expert

Media Expert Corrections and Suggestions	After Revision
The choice of color in the writing should be adjusted so that it looks clearer when read 	Revisions are made to adjust color changes 
The background chosen should be brighter in color	Revisions were made to change the background to a brighter color 

b. Theoretical Validation

The results of questionnaires and interviews show that the material experts who delivered learning media based on PowerPoint Macro and Prezi received an average score of 4.8 with a percentage of 96%, indicating very good quality. The use of PowerPoint Macro and Prezi-based learning media is very suitable for the

learning context in elementary schools, but needs to be revised based on the suggestions given to improve its quality.

Evaluation results through questionnaires and interviews with language experts show that PowerPoint Macro and Prezi-based learning media received an average score of 4.7 with a percentage of 94%, indicating very good quality. Therefore, this learning media is suitable for use in the learning process in elementary schools. However, some revisions are still needed in accordance with the suggestions that have been given.

The results of questionnaires and interviews with media experts showed that PowerPoint Macro and Prezi-based learning media received an average score of 4.9 with a percentage of 98%, indicating very good quality. This shows that this learning media is very appropriate to use in an educational environment at the elementary school level. However, revisions still need to be made based on the suggestions that have been given.

c. Empirical Validation

Based on the results of a questionnaire from individual trials involving 5 students with different levels of intelligence, representing students with high, medium and low levels of intelligence, it shows that all aspects assessed received very positive responses from students, with a percentage reaching 93% and categorized as as "Very Strong". However, at this stage, students experience confusion when logging in to the Prezi application because it requires a Prezi account or email account. As preparation before carrying out small group trials, the step taken is to create a Prezi account or email account for each student so that they do not experience difficulties when accessing the Prezi application.

From the results of a small group trial questionnaire involving 9 students with different levels of intelligence, representing students with high, medium and low levels of intelligence, it shows that all indicators received a very positive response from students, with a percentage reaching 90% and categorized as " Very strong". At this stage, there is no need for changes or revisions to the media because each indicator gets very good feedback from students. The next action is to continue field trials involving a larger number of participants.

d. Effectiveness of PowerPoint Macro & Prezi Based Learning Media

Field trials are the final stage in the formative evaluation process. The aim is to evaluate the effectiveness of PowerPoint Macro and Prezi-based learning media in achieving the desired goals, as well as to collect student responses to the use of these products. To evaluate the effectiveness of PowerPoint Macro and Prezi based learning media, it is necessary to use learning outcomes tests using

Pretest and Posttest. Next, the Pretest and Posttest will be analyzed using the normality test and homogeneity test to determine the appropriate type of statistics, whether parametric or non-parametric. If the results meet the assumptions of normal distribution and homogeneity, parametric statistical tests, such as the T-test, will be used. However, if the results do not meet these assumptions, a non-parametric statistical test, such as Wilcoxon, will be used. The field trial was carried out involving 62 students from two different schools, namely 25 students from SDIT Peradaban Global Qur'an and 37 students from MIS An-Nur. Below is a table that explains the activities carried out during the field trial.

1) Tests of Normality

Table 4. Tests of Normality

		Kolmogorov-Smirnova			Shapiro-Wilk		
	Class	Statistic	df	Sig.	Statistic	df	Sig.
Value	Pretest	.181	37	.004	.914	37	.008
	Posttest	.260	37	.000	.782	37	.000

a. Lilliefors Significance Correction

Judging from the table above, the Shapiro-Wilk significance value for the Pretest data is 0.008, while for the Posttest data it is 0.000. This shows that both values are less than 0.05, so it can be concluded that the data does not have a normal distribution.

2) Test of Homogeneity of Variance

Table 5. Test of Homogeneity of Variance

		Levene Statistic	*df1*	*df2*	*Sig.*
Value	*Based on Mean*	6.837	1	72	.011
	Based on Median	2.379	1	72	.127
	Based on Median and with adjusted df	2.379	1	55.574	.129
	Based on trimmed mean	5.761	1	72	.019

Based on the data in the table above, a significance value based on the mean is 0.011, which is smaller than 0.05. This shows that the data is not homogeneous.

3) Hypothesis Testing

Based on prerequisite testing, the results obtained were that the data did not meet the assumptions of normality and homogeneity. Therefore, we continued by using a non-parametric statistical test, namely the Wilcoxon test, to test the hypothesis.

Table 6. Wilcoxon Test Results

		N	*Mean Rank*	*Sum of Ranks*
Posttest - Pretest	*Negative Ranks*	2[a]	3.50	7.00
	Positive Ranks	32[b]	18.38	588.00
	Ties	3[c]		
	Total	37		

a. *Posttest < Pretest*

b. *Posttest > Pretest*

c. *Posttest = Pretest*

Based on the data in the table above, it can be seen that there is a negative rank value of 3.50, which indicates a decrease in the average science learning outcomes of students from Pretest to Posttest. On the other hand, there is also a positive rank value of 18.38, which shows an increase in the average science learning outcomes of students from Pretest to Posttest.

Table 7. *Test Statistics*

	Posttest - Pretest
Z	-4.990[b]
Asymp. Sig. (2-tailed)	.000

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

Based on the Test Statistics output above, the Asymp value was found. Sig. (2-tailed) is 0.000, which is smaller than the significance level of 0.05. This indicates that there are significant differences between the two samples. Thus, it can be concluded that there is a significant difference in learning outcomes in science subjects, especially in the human digestive system material, between class V students at SDIT Global Qur'an Civilization and MIS An-Nur before and after using PowerPoint Macro and PowerPoint-based learning media. Prezi.

DISCUSSION

Development of PowerPoint Macro & Prezi Based Learning Media

According to (Iwan Falahudin A., 2014), learning media can be defined as anything that can flow information from information sources to information recipients. Overall, learning media are tools or resources used in the teaching and learning process to convey information from learning sources.

PowerPoint Macro and Prezi-based learning media developed for class V science learning in MI/SD is an innovative digital learning solution. This product is specifically designed to provide support to teachers and students in science learning activities, especially in Basic Competency 3.3 which includes an explanation of the digestive organs and their functions in animals and humans, as well as how to maintain the health of human digestive organs.

Through the use of PowerPoint Macro and Prezi-based learning media, teachers can deliver learning material in a more interactive and interesting way. The animations, graphics and images included in this media can help visualize the digestive organs clearly, making it easier for students to understand.

In accordance with research conducted by (Haerani, 2017), regarding the development of interactive PowerPoint-based learning media, it shows that this media can increase students' understanding and attract their interest in the material.

PowerPoint Macro and Prezi based learning media also provide interactive capabilities to students, students can be directly involved in the learning process by reading material and playing games that have been provided in the learning media.

The importance of introducing material to students through the use of media in learning has a significant impact and can increase students' learning achievements. The use of media in learning activities can also speed up the learning process in the classroom. Media is a communication tool for teachers to interact with students and carry out teaching in the classroom environment.

Validity of PowerPoint Macro & Prezi Based Learning Media

According to (Sugiono, 2015), before the product that has been designed is tested, a validation stage will be carried out by experts to analyze the product from various aspects, so that the product is ready to be tested in the formative evaluation stage. Validation is an evaluation process that aims to determine whether the learning media product design that has been created meets the requirements to be tested.

In research on the development of learning media based on PowerPoint Macro and Prezi, it was validated by several experts, namely, material experts, design experts and language experts. Media experts are responsible for evaluating the effectiveness of learning media products in terms of their appearance, while material experts will evaluate their relevance to the subjects covered in the product. Apart from that, language experts will assess the systematic aspects and style of written language.

The validation results obtained from the three experts show that PowerPoint Macro and Prezi-based learning media are very suitable for use in science learning in fifth grade elementary schools.

In the validation process, material experts gave 96% approval for the accuracy and adequacy of the content presented in the learning media. They assessed that the material presented comprehensively included an explanation of the digestive organs and their functions in animals and humans, as well as the importance of maintaining the health of human digestive organs.

Furthermore, language experts gave 94% approval regarding the suitability of the language used in this learning media. They found that the language used was precise, clear, and easy to understand by students.

Finally, media design experts gave 98% approval to the design and visual presentation of this learning media. They recognize that the use of animation, graphics and attractive layouts in these media can motivate students and increase their understanding of science material.

With a high percentage of agreement from the three experts, it can be concluded that the PowerPoint Macro and Prezi based learning media have passed the theoretical validation stage successfully. This media is considered very suitable for supporting science learning in class V MI/SD, providing an effective learning experience and supporting a good understanding of the digestive organs and how to maintain the health of human digestive organs.

Practicality of PowerPoint Macro & Prezi Based Learning Media

Yanto, (2019) in his research stated that practicality testing was carried out with the aim of finding out the use of learning media in a learning process. The

level of practicality of PowerPoint Macro and Prezi-based learning media in class V MI/SD science learning can be assessed based on students' assessments after they use this learning media. The assessment results show that this learning media has reached a very high level of practicality, with a satisfaction percentage of 93% during individual trials and 90% during small group trials.

In individual trials, as many as 93% of students stated that this learning media really helped them in understanding science learning material about the human digestive system. Students are actively involved, enjoy interactive games, and easily understand the material presented through this media.

Furthermore, in small group trials, as many as 90% of students gave a positive assessment of this PowerPoint Macro and Prezi-based learning media. Students stated that this media helped gain better understanding and made students active in learning.

With the high percentage of satisfaction from students in both types of trials, it can be concluded that PowerPoint Macro and Prezi-based learning media have a very high level of practicality in their use by students and teachers in the science learning process, especially for material on the human digestive system.

Effectiveness of Science Learning Media based on PowerPoint Macro & Prezi

The effectiveness of using PowerPoint Macro and Prezi-based learning media in science learning for class V MI/SD can be assessed through differences in learning outcomes before and after field trials using pretest and posttest questions. Analysis of the results shows that there has been a significant increase, with the Pretest having an average value of 53.0 and the Posttest having an average value of 82.9.

Through the use of the Wilcoxon test, the analysis results show that the Asymp. Sig. 2-tailed is 0.000, which is smaller than the significance value of 0.05. This shows that there are significant differences between the two samples, namely learning outcomes before and after using PowerPoint Macro and Prezi-based learning media. In other words, this learning media effectively improves student learning outcomes in science subjects, especially in the material on the human digestive system in class V SDIT Global Civilization Qur'an and MIS An-Nur.

In line with research conducted by (Miswati et al., 2020), PowerPoint Macro-based learning media can increase students' learning motivation, reading interest and cognitive learning outcomes. The results of a significant increase in the average score from Pretest to Posttest indicate that the use of PowerPoint Macro and Prezi-based learning media has a positive impact on students' understanding of science material. This media can facilitate a more interactive

and interesting learning process, so that students are more involved and able to achieve better understanding.

Thus, based on the analysis of differences in learning outcomes before and after using this learning media, it can be concluded that the use of PowerPoint Macro and Prezi-based learning media is effective in improving student learning outcomes in science subjects, especially in material on the human digestive system in class V SDIT Peradaban Global Qur'an and MIS An-Nur.

It can be concluded that from the results of the research above related to the development of PowerPoint Macro and Prezi learning media in increasing reading interest, understanding of the material, learning outcomes and critical thinking contained in PowerPoint Macro and Prezi based learning media. There has been a renewal in the use of learning media by combining two applications, namely PowerPoint and Prezi, in one lesson. When using the Prezi application, it is used to display learning material with a dynamic and interactive display. On the other hand, the PowerPoint application is used to present game elements that can increase student involvement in learning. By combining these two applications, learning becomes more interesting, interactive and effective in helping students understand the material being taught. One of the advantages of using PowerPoint Macro and Prezi-based learning media in science subjects is the ease of use both independently and with the help of a teacher. Apart from that, this media can also be used repeatedly.

CONCLUSION

PowerPoint Macro and Prezi-based learning media developed for class V science learning in MI/SD is a digital learning product specifically designed to support teachers and students in science learning activities, especially in Basic Competency 3.3 which includes explanations about digestive organs and its function in animals and humans, as well as how to maintain the health of human digestive organs.

This learning media has passed the validity or theoretical validation stage involving three experts, namely language experts, media design experts and material experts. The validation results from the three experts show that PowerPoint Macro and Prezi-based learning media are very suitable for use in science learning in fifth grade elementary schools. The percentage of agreement obtained was 96% from material experts, 94% from language experts, and 98% from media design experts.

The level of practicality of PowerPoint Macro and Prezi-based learning media in class V MI/SD science learning based on students' assessments after using this learning media is at a very high level of practicality with a percentage

gain of 93% during individual trials and 90% during testing. try small groups. Thus, it can be concluded that PowerPoint Macro and Prezi-based learning media have a very high level of practicality in their use by students and teachers in the science learning process for material on the human digestive system.

The effectiveness of using PowerPoint Macro and Prezi-based learning media in science learning for class V MI/SD can be assessed from the differences in learning outcomes before and after field trials, by providing Pretest and Posttest questions. The results of the analysis show that there has been an increase, the Pretest has an average value of 53.0 and the Posttest has an average value of 82.9. As for the Test Statistics output using the Wilcoxon test, the Asymp value was obtained. Sig. 2-tailed is 0.000 < 0.05, so it can be concluded that there is a significant difference between the two samples. This means that there are differences in learning outcomes for science subjects on the human digestive system in class V SDIT Global Civilization Qur'an and MIS An-Nur before and after using PowerPoint Macro and Prezi-based learning media .

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