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Development of Interactive e-Learning Media on Environmental Pollution using Prezi

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Abstract: This study aims to develop an interactive learning media application based on Prezi. The methodology used in this study is the ADDIE method with a sample of class VII students. Data collection techniques were carried out through media experts and material experts including media and material expert validation questionnaires, student observation sheets, interview sheets, pretest-posttest sheets and response questionnaires. The results showed that the application of Prezi-based learning media had a media feasibility effect of 95% with very decent criteria and 95% on Prezi-based learning outcomes, with very good criteria. Student responses resulted in an average of 87% with very interesting criteria besides the results of the N-gain analysis of 0.73 which was included in the high category. effectively used in the learning process.

Keywords: e-learning, interactive learning media, Prezi

Abstrak: *Penelitian ini bertujuan untuk mengembangkan aplikasi media pembelajaran interaktif berbasis Prezi. Metodologi yang digunakan dalam penelitian ini adalah metode ADDIE dengan sampel siswa kelas VII. Teknik pengumpulan data dilakukan melalui ahli media dan ahli materi meliputi angket validasi ahli media dan materi, lembar observasi siswa, lembar wawancara, lembar pretest posttest dan angket respon. Hasil penelitian menunjukkan bahwa penerapan media pembelajaran berbasis Prezi memiliki pengaruh kelayakan media sebesar 95% dengan kriteria sangat layak dan 95% terhadap hasil belajar berbasis Prezi, dengan kriteria sangat baik. Respon siswa menghasilkan rata-rata 87% dengan kriteria sangat menarik selain itu hasil analisis N-gain sebesar 0,73 yang termasuk dalam kategori tinggi. efektif digunakan dalam proses pembelajaran.*

Kata kunci: *e-learning, media pembelajaran interaktif, Prezi.*

▪ INTRODUCTION

The Covid-19 pandemic has changed various aspects of people's lives, including the economic, social, political, to education sectors. The virus is thought to have originated in China. Considering the health impacts and threats posed by the Covid-19 pandemic, governments in various countries have begun to impose traffic restrictions or lockdowns, especially in Indonesia, large-scale social restrictions are being implemented to limit the spread of the Covid-19 virus (Hermawan, 2021). Despite the lack of coherence between proponents of learning and assessment, instructional factors can play a role in how science is learned. The emergence of the Covid-19 pandemic has given rise to the need for online involvement in science teaching and also learning, presents new challenges for teachers and students (Erduran & Olga Loannidou, 2021). As a request for online resources have increased, the question remains to what extent online resources can support epistemic thinking, especially in relation to the journey of assessment result.

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Equipping individuals with adequate knowledge and understanding of science and technology has become one of the main goals of the education system (Erdas Karta & William W. Cobern, 2018). Through the Internet, people have new forms of communication over the years. One of them forms in online learning, is known to have a history of early access in the 1980's while another term, referred to as e-learning, did not its origins are not fully disclosed. As a researcher and designers leveraging this emerging technology, we found that the use of easy terms makes it difficult to design and evaluate similar learning environments without understanding certain characteristics. The framework shows, however, that understanding in our current science program is finding many science programs through many online simplified website-according to the needs (Duschl & Bybee, 2014).

Teachers as the most important component in formal education must encouraged to learn and able to adapt to the implementation of learning that used to only rely on traditional learning, namely: face-to-face techniques and has now shifted to online learning so that education will increasingly develop according to the times. Online learning requires flexibility in the use of technology to continue teaching and learning process. Technological advances are used as learning media in teaching and learning process (Amalia & Sari, 2022). The use of learning media in the teaching and learning process the process should significantly improve the functional learning process (Tekege, 2017). In conclusion, the existence of online learning media that can generate new desires and interests, motivate and stimulate learning activities and even has a psychological effect on students when used in the teaching and learning process.

The learning media in this study serves as a facilitator in the implementation of learning methods as an effort to improve the quality of student-teacher interaction, as well as the quality of learning media learning process activities. Learning through computer networks and the internet is known as e-learning. E-learning can go beyond the limitations of teaching and learning and not limited by space and time, allows students and teachers to communicate with each other anytime and from anywhere. In a world dominated by science and technology, it is very important to raise students who are literate in science and technology so as not to be alienated from modern society (Khishfe, 2014).

One of the alternative media that that can be used is internet-based learning media using the online Prezi software. Prezi is an internet-based software that is used as a presentation medium as well as a tool to convey ideas on a virtual. The advantage of Prezi is the Zooming User Interface (ZUI), which is the ability to zoom in and out on presentation slides (Rodhi & Wasis, 2014). Prezi is one of the effective media for improve student learning processes. Prezi is more effective instructional to gain knowledge compared to traditional media. Prezi is transformative tools that build students' ability to present information through logic, visuals, and spatial relationships (Hartini & Misbah, 2017).

Investigated interactive animation as a dynamic analogy and found that visualizing these unobservable phenomena improved students' conceptual learning, compared to narrative texts and analogous static images. Compared lab experiments and computer simulations in physics and found that simulations offer a number of opportunities that are difficult to experimental laboratory (Kluge, 2019). To prepare students to weigh new arguments and make decisions, we design instructions to

promote a coherent understanding of mechanisms and contributing factors such opportunities can give students more direct access to concepts as and visual representations can be important in limiting their operations in a number of productive ways at the same time, the author emphasizes it (Svihla & Linn, 2012). The outcome of using this type of technology is highly dependent on how it is interacted designed, recommends them to be highly interactive, visualize the unseen and find ways to let students engage with challenging concepts. In summary, the existing research is quite positive regarding the impact of interactive representations in the learning process, as simulators, animations or interactive models. This positive impact depends on a balanced pedagogical structure between step-by-step structure and free exploration and challenged them to take advantage of existing experience and knowledge.

We are interested in how students and teachers learn together as part of evolution socio cognitive system. This involves expanding the unit of analysis beyond the individual student. In the field of computer-supported collaborative learning (CSCL) who has contributed significantly to demonstrate the success of expanding the unit of analysis group cognition (Christian Arnseth & Krange, 2016). Recently introduces the idea of collaboration-as-learning as a way of viewing learning as a relationship-changes to multipart systems (Enyedy, 2015). Several design-based studies have examined how various forms of digital support tools laboratory-based experiments and students in school science. Digital tools in simulation forms and tools to support student reflection have become the focus. Starting with the simulation, the findings show that a combination of physical lab experiments and the support provided by virtual labs, often containing interactive simulation tools, can improve students' conceptual understanding document the positive effect and show that the combination of lab experiments and virtual tools improves conceptual understanding of light and color beyond the use of a lab or virtual experiment tools only (Furberg, 2016).

There is bound to be a lot of interest in, and euphoria about, the potential of technology in improve and transform science teaching and learning in schools. Indeed, like euphoria, in some cases, skews reporting of empirical studies related to the impact of technology-supported inquiry-based science learning. (Waight & Abd-Khalick, 2012). are guided by the assumption that, when used in the context of authentic, high-end innovative technologies in this case, global positioning systems (GPS) and geographic information systems (GIS) will develop students' technological fluency and their scientific inquiry skills.

The student's most favorite science topic study consistently is identifying environmental context (Zeyer & Dillon, 2018). There are various definitions of interactive learning. Some experts define interactive learn as a synonym for cooperative learning through Pair work, group work, and projects usually involve a topic of self-chosen, inquiry-based methodology, and problem solving in cooperative task Some literature suggests that interactive learning is the actualization of the learning environment, which supports the interaction between student group of learners (Son & Sun, 2018). However, interactive learning can be defined as 'a method of organizing learning with others, but' learning is understood as a focused process about the development where the essence of interactive learning is the learning process rather than a particular interaction environment. Student-centered interactive learning, where students learn at their own pace, with choose time to work and find collaborators their

own preferences Based on this definition, this study the definition of interactive learning as a pedagogical approach which facilitates student development by acquiring knowledge through interaction with peers and the growth of independence in learning.

Over the past few decades, science and science related topics have become increasingly topics discussed in the media because of important discussions regarding scientific phenomena such as the coronavirus (Covid-19) pandemic, global warming and environmental pollution caused, for example, by large quantities of microplastics in the ocean or nanomaterials in wastewater (Stamer & David, 2021). The use of Prezi media makes it easier for students to understand information, and insert various pictures, photos and videos to support ease in preparing presentation slides. This is because Prezi media is equipped with multimedia integration, so that the media can combine photos, videos, images, and animations. New emerging multimedia is coming to help someone in presentation. One of them is the program Prezi application (Ningsih & Komikesari, 2019). Prezi is a medium displayable alternatives ideas or ideas in interrelated views slideshow with other slides easy, this is very helpful students so that they can easily understand the current presentation material shown.

▪ METHOD

The research was conducted in a junior high school for 4 weeks April 2022. This research method using R&D. Development research is a process or series of procedures that can be followed in to create new products or improve existing products (Sukmadinata, 2005). ADDIE Development stage (Analysis, Design, Develop, Implement, and Evaluate). However, this study was only conducted on development. The next stage is further research. Needs analysis as the first step in developing e-learning learning media. The analysis was carried out by giving respondents analysis questionnaire sheet. Initial product design assessment instruments and media are made such as choose a website domain, hosting, and Prezi applications. This study adapts ADDIE according to (Klein, 2014) used the term design and development research which has understanding of the systematic study of the process of designing, developing and evaluation with the aim of establishing an empirical basis for product manufacture and instructional and non-instructional tools and new or improved models which governs its development

The stage of the e-learning process, which includes: (1) the initial process of making e-learning and making learning materials. (2) Designing e-learning display and manage the appearance of the e-learning page and the selection of the appropriate e-learning theme background. (3) Uploading learning materials to Prezi (4) Learning validation media by media and materials experts, (5) Product revision based on validation results. (6) Student responses to the resulting learning media. Prezi-based e-learning media validation data on the theme of environmental pollution was analyzed descriptively using the percentage with assessment criteria (1) less feasible (21-40%), (2) quite decent (41-60%), (3) decent (61-80%), and (4) very feasible (81-100%) are learning media criteria rating scale (Irianti & Wijaya, 2017).

The stages of developing this interactive learning media modify the model developed by Borg & Gall which includes the initial investigation stage, design stage, realization stage, test stage, evaluation, revision stage and implementation stage. The population consisted of all seven grade students at the junior high school level and the sample consisted of 37 students. The data collection technique is the first by using an

observation sheet that analyzes student activities in the learning process, the second by using a face-to-face interview sheet to teacher and student participants. The third is by using the pretest and posttest question sheets and the fourth by using a questionnaire. The research design used is experimental. The research design used is experimental, the instruments used include observation sheets, media experts and material experts, pretest and posttest question sheets and questionnaire. The research period is 15 weeks.

According to (Sugiyono, 2008), the validity test is distinguished into three types, namely the validity of the construction (construct validity), content validity, and external validity. On research in this case, the validity used is the validity of the construction (construct validity). Testing the validity of the construction (Construct Validity) can be This is done by asking for opinions from experts (experts judgments). Instruments are made according to the aspects to be measured which is then consulted with experts to determine ask for an opinion whether the instrument is feasible or not. In addition, testing the validity of the instrument was carried out by calculate using the Product Moment Correlation technique (Arikunto, 2006). If the results of r recount > r table with a significant level 5% will be declared valid. The questionnaire is said to be reliable if at the time the questionnaire is used repeatedly will produce the same data results. This reliability aims to determine the consistency of the research instrument used. The measurement in the form of a questionnaire or a graded scale (rating scale) tested with using the Alpha Cronbach technique. Cronbach's Alpha Formula used to find the reliability of the instrument whose score is not 1 and 0.

Media validity analysis with assessment of three validators consisting of two expert validators and one practitioner validator covering aspects, namely format, content, materials, language, graphic and presentation. $3 \leq RTV \leq 4$ = valid, $2 \leq RTV < 3$ = quite valid, $1 \leq RTV < 2$ = invalid. Media effectiveness analysis is student learning outcomes test scores after get learning with using -based learning media multimedia. Complete learning with media is 80% of students who follow learning is able to reach the level of mastery of the material at least moderate or a minimum of 80% of students who follow learning is able to achieve a score of 75 with score maximum is 100. Score interval determining the level of student mastery set as follows $0 \leq TPS < 40$ very low, $40 \leq TPS < 60$ low, $60 \leq TPS < 75$ medium, $75 \leq TPS < 90$ high, $90 \leq TPS \leq 100$ very high. Student response analysis is a positive response from students who shown from the questionnaire as follows determine the average of the positive response students, then determine the response category or students' responses to a criterion by matching the results percentage with criteria, namely $85\% \leq RS$: very positive, $70\% \leq RS < 85\%$: positive, $50\% \leq RS < 70\%$: less positive, $RS < 50\%$: not positive. Media practical analysis assisted learning media computer is said to be practical if the results of the evaluation the validator states that the media the computer-assisted learning can be used with little or no revision. Rating given by validator through a questionnaire containing about -based learning media assessment multimedia. (Rasyid & Andi Asmawati Azis, 2016).

▪ RESULT AND DISSCUSSION

The results of this development research are the product Prezi-based interactive learning media. Here is shown about the presentation of the results of the discussion based on the ADDIE model.

Preliminary Investigative Analysis

This initial investigation was carried out to collect information about difficulties learning experienced by students as input in designing learning media that can be a source of learning. Some learning difficulties found namely limited media and resources learning, students get bored faster in the teaching and learning process because tend to be verbal, time is limited learn in class and students find it difficult when they have to listen to the teacher's explanation while record what is explained or written teacher. Students must engage in scientific practice related to reading and understanding through pictures and videos (Dori & Avargil, 2018).

Technology's big part in the modern society and student learning process is no longer new. It has come to becomes necessary to use the advancement and evolution of technology to forge and to create a better, interactive, appealing and engaging study environment for the students. This will definitely pass through a long procedure in making the study easier, faster and more fun. With the development of technology has come an innovation and transformation of the teaching and learning process (Zaghloul & Rabeh, 2017).

How to use modern media and computerized graphics programs can create teaching and learning process, as well as interaction in the school environment becomes a superlative and attractive sight. Accessibility of organized media technology everywhere in schools will work as a driver that can ensure that students learn better. even more so, they can enable students to easily understand the concepts of the lesson being taught. Engaging different senses simultaneously in a study the room creates a stimulating environment and better opportunities for students to actually learn as well. What students hear may forget? What they see they remember for a while? What to do they say? They must remember. But what do they experience?

They will never forget. This underscores the importance of using technological advances to help intellectual and growth of education and awareness not only students, but also educators and communicators (Omar & Bidin, 2015). Information can be disseminated faster and easy with the use of media images for various forms. Engaging students in internet school journalism and publishing is not only teach them valuable practical media skills they need to excel in a society driven by fast-moving technology, but will also improve interest in learning, broaden their cognitive abilities and stimulate their imagination and curiosity. Therefore, opening the endless door of opportunities for them.

However, learning media design students are faced with various instructional and technological constraints that can affect their performance. From an instructional-pedagogical perspective, the most indicative are as follows: (a) lack of main instructor support in training sessions using contemporary web-based sources and (b) lack of technology infrastructure for user interaction in a digitally oriented environment. This situation may have negative impact on student participation without using a-/synchronous communication tools (Richter & Muskens, 2015). Other typical problems that hinder success teacher interactions in utilizing online digital communities are as follows: (a) lack of active membership contribution in online discussions, (b) lack of user incentives (Ally, 2016), and (c) lack of trust and interaction, which can hinder communication between users in online communities. even more so, lack of interactivity in learning. For example, in delivering learning, only providing video

recordings or simple pictures, it is very difficult for students to absorb learning content. Even though it's free time because I don't have to attend class meetings and being able to learn something seems fun, it's necessary away from the interpersonal skills that students need to acquire along with their education. This unsustainable trend of participation is caused by external causes, such as busy study schedule, lack of time, or lack of access to Internet (Arcas & Buil, 2013). Overall, the problems mentioned above lead the instructor and educators expect negative effects on student learning experience and performance.

Student analysis is a study of student characteristics that match media development plan learning. Characteristics of students obtained through interview questionnaires distributed against 37 students of class VII, who shows 85.12% indicates that multimedia-based learning media make learning more interesting. Results From the questionnaire, the student's attitude shows that students are more interested when the teacher teaches by using learning media multimedia based. Media design development is also adjusted to the stage operational children, and children in class XI already in the formal operational stage. Based on the stages of development Cognitive theory proposed by Jean Piaget then in cognitive analysis it is assumed that the student has entered the stage development of formal operations where age 10 years and over. Characteristics of this stage is the acquisition of the ability to think, reason logically, and interesting conclusions from the available information. On at this stage, metacognitive abilities have been developed. From a biological point of view, this stage appears at puberty (when various other major changes), marking entry into the adult world physiologically, cognitive, moral reasoning, development psychosexual, and social development.

Research conducted over the past 40 years has found a consistent relationship between students' perceptions of their learning environment, social and psychological the environment in which learning occurs and various affective and cognitive outcomes. Studies have found that positive perceptions of learning environment is associated with favorable attitudes toward learning, beliefs about nature of science, academic achievement, and academic self-efficacy (Wild, 2015). Prezi e-learning media with the theme of environmental pollution that can be used as learning, such as the ability to collect information and also the ability of skills as a student's first step in the learning process as a needs analysis (Sukiman, 2012) . Analysis conducted using a needs analysis questionnaire. Based on the findings of the questionnaire results, online learning is not as bad as traditional learning but is effective in conveying information that comes from the abstract and then becomes concrete, it can also help teachers need learning media that can be used in learning. The results of the needs analysis conducted by students in school produces an average of 85% with the criteria agree. Creative learning can motivate students to improve their learning outcomes. Utilization of new learning media, strategies, and insights so that students do not get bored while studying (Setiyawan, 2012).

Learning Media Design

Research in science education has historically focused on the cognitive side of teaching and learning, with a focus on acquiring student knowledge (Hite & McDonald, 2021). Activities carried out at this stage more than the results that have been obtained

at the initial investigation stage then a solution is designed. Design, in this stage the researcher selects and specify the software that used to create media Prezi-based learning that is researcher choose Prezi as inner media this research because with Prezi it will make it easier the teacher in compiling the material, expanding the material and expanding the dissemination of information that is packaged with attractive pictures and slides and has the advantages of video conferencing. Prezi can also accommodate a lot of learning media support is suitable for use in the required material content and can share the results of the presentation with everyone. Create product designs that will be produced and become the initial product of media, design this product is well done and as interesting as possible produce a good product and can used in the teaching and learning process in class.

Next is collecting material with collect materials or materials that required to be inserted into the media learning. Main material manufacture (subject of the subject) is entered into Prezi so that it becomes an information-rich media for users, namely the theme of environmental pollution accompanied by factors that influence the existence of air, water and soil pollution, besides that there are environmental parameters that function to determine when the temperature in the environment is being polluted or even in good condition. In addition to the material also included supporter's others in the form of pictures and videos in order to bring up a stimulus to students.

The assembly stage is a script air pollution theme material that is included in each

posts into Prezi based on sections in specific slides. The thing we have to do beforehand is to describe the basic competencies then the results of the description are made into an indicator then from the indicators we can easily draw some of the most important aspects that will be studied with students. Therefore, it is important in making a concept map to find out the parts that will be studied more deeply or in a simple way. The aspects that will be discussed in this research are described in the table below.

Table 1. Indicators and concept labels on environmental pollution basic competencies

Basic Competencies	Indicator	Aspect Label
Analyzing the occurrence environment and environment for ecosystem	Explain the meaning of pollution environment.	Pollution level parameters and environmental ecosystem
	Explain the types of pollution environment.	
	Explain the meaning of water, air and soil pollution	
	State the factors that cause air, water and soil pollution	
	Investigate the effect of clear water from polluted on the condition (movement) of fish)	

Based on table 1, there are 5 indicators developed from KD 3.8 regarding environmental pollution. Furthermore, Concept labels are created to define the core concepts of the material related to aspects of environmental pollution. After the concept label is determined, then make a concept description to ensure the scientific truth of each concept, concept description taken from international standard textbooks whose validity has been recognized by scientists (Arizaldy & Anwar, 2022).

Learning Design Media Development

At this stage the researchers developed learning tools, research instruments, and Prezi. Learning tools are arranged in the form of a syllabus and lesson plans. The research instrument made consisted of a validation sheet, an interview sheet and a learning implementation questionnaire. The researcher made the Prezi display starting from the cover, content, and exercises on the theme of environmental pollution. This Prezi was developed aiming to improve students' scientific explanation skills. This is shown by preparation of material and practice questions that are adapted to scientific explanations skill indicators. The material section on Prezi can be seen in Figure 1.

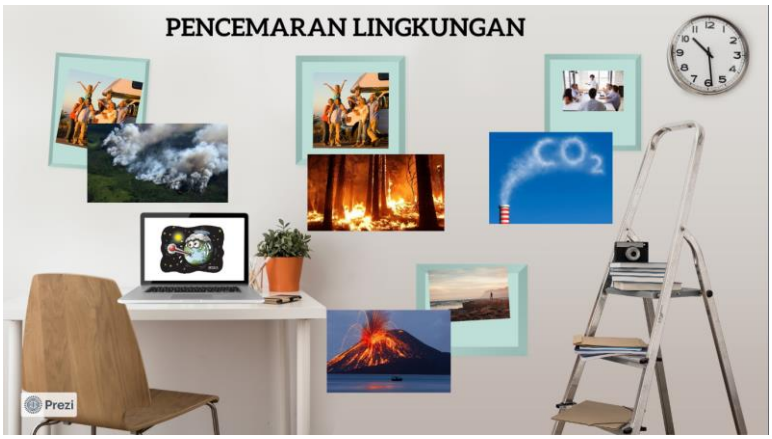

Figure 1. Display of environmental polluting material content on Prezi

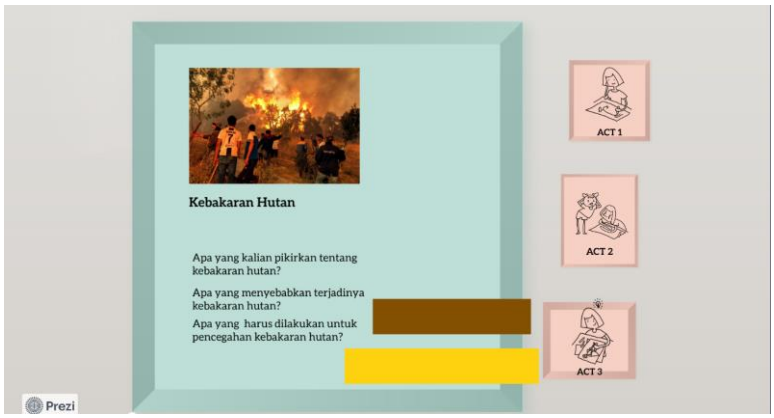

Figure 2. Display of environmental polluting material content on Prezi

Table 2. Prezi learning media validation results

Label Aspect	Validator 1	Validator 2	Validator 3	Average
Media Material	95%	95%	95%	95%
Media Content	96%	95%	94%	95%
Media Presentation	96%	97%	95%	96%
Media Graphic	94%	94%	94%	94%
Language	95%	94%	96%	95%
Average				95% (Very Valid)

The results of the validation of the Prezi learning media can be seen in Table 2. It is known that the average validity score of the three validators is 95%. This result shows the category very valid and can be used without revision. This result is in line with the opinion. Learning media can be implemented in science learning if it is valid score above 70% - 100% (Akbar, 2013). Based on the results of the validation, it can be seen that the Prezi learning media shows a valid and usable category, which is well structured in content validity and construct validity. The product of development research is feasible when the product is adequate in content and construction validity aspect (Mardhiyyah & Supeno Supeno, 2022). There are some additional suggestions from the validator that there is a spelling that is quite perfect but the equivalent words are still lacking.

Interactive learning has caught the attention of educators and undergraduates in higher education. Interactive learning is a continuous learning process an environment that supports structured interactions between teachers and students, and between students (Son & Jing Sun, 2018). Traditionally, learning has been considered unidirectional where only the instructor provides information to students (Castaño-Muñoz & Josep M. Duart, 2014). For example, traditional classroom arrangement usually follows lecture-example-homework a format in which the instructor chronologically delivers lectures, presents examples to students, and allows students to practice alone with homework (S. Mason & Teodora Rutar Shuman, 2013). However, in interactive learningorganize discussions between instructors and students, and between students occurs freely (Ball & Lauren Ball, 2012). Moreover, to produce student-centered interactive discussion, students are required to find selective topics, inquiry-based methodologies, and forsolve problems while learning self-control and problem-solving skills through collaborative tasks.

Practicality Implementation of Prezi-Based Learning Media

Understand the multimedia elements that affect and how interact with technology. Technology helps make it easier to interact and reach all material content needed appropriately to reflect learning which can provide more relevant information to meet dynamic changes. The learning context contains many. However, learning can be done through computer technology devices anywhere and anytime because of the computer-based program strategy. The interventions used in these various studies are learning media that presenting computer-based interactive visual programs in order to improve stimulus and reflect cognitive processes. Visual material provide visual understanding and attention. This occurs during the content displayed on the screen with clear images, appropriate fonts and colors. There are some ways for comprehension instruction strategies and five vocabulary teaching strategies. One of them is to ask questions strategically (Khowaja & Salim, 2013).

Interest in science (also called intrinsic motivation) refers to emotions and cognition inherently generated by science content, which then serves as a driver of engagement and the purpose of content mastery during learning. Focus researcher on curiosity to learn science has found that students who are exposed to an environment that emphasizes student-directed learning become curious and curious more about science by discovering and exploring the world on their own. Greater exposure to science activities can increase interest in science and thus helps to master science (Lin

& Schunn, 2016). Researchers conduct science teaching to evaluate effectiveness and practicality in learning at this stage. During the learning observation process, students seemed to have no difficulty accessing the Prezi learning media, but there were some students who had difficulties due to the signal network. These obstacles can be overcome by sharing the phone with other friends to access the module. The results of the practical evaluation of Prezi learning media are shown in Table 2.

Table 3. Practical results of Prezi learning media

Observed Aspect	Lesson Meeting 1	Lesson Meeting 2	Average
Student Activities in Early Learning	95%	95%	95%
Student Activities in Mid-Learning	94%	96%	95%
Student Activities in End of Learning	95%	97%	96%
Total			95% (Very Practical)

The practicality of Prezi learning media is shown during the implementation of learning, namely the process of following the learning implementation plan. Aspects observed in the learning process is the movement of students when using Prezi learning media in every step of teaching. Based on in Table 3 it can be seen that the average practical value of the three observers is 95% which fall into the very practical category. This is in line with (Adriyani, 2018) that the implementation of teaching when the value of practicality is found in the results of more than 61%. So with the practicality value of learning media Prezi of 95%, it can be said that Prezi learning media is very good practical to be applied and used by students and teachers in the science learning process, especially the theme of environmental pollution.

A number of studies on student learning strategies have been conducted, with a focus on behavior and thinking of learners that affect their encoding process in learning. In addition, it has been suggested that student learning adoption strategies correlated with their learning performance. The application of active and interactive learning strategies can affect students' biological conceptual understanding, attitudes, and motivation. Therefore, it is very important to explore student learning strategies (Shen & Lee, 2018).

There is a greater emphasis on the role of whole class discussion in the author's practices than those recommended by texts intended for primary school teachers, which tends to focus on dialogue with individual children and with small groups. It is found 50% of interactions in English science lessons take place in a whole-class setting (McMahon, 2012). They also describe how in science lessons there are limited opportunities for children to explore on their own ideas or to ask questions, noting that the teacher's statements are handled twice as much facts related to ideas. This general trend still exists. This emphasis on whole-class teaching is inconsistent with constructivist learning theories in science.

Evaluation of the Effectiveness of Prezi-Based Learning Media

Table 4. Results of the effectiveness of Prezi learning media through pretest and posttest

Data	Pre test	Post test
Total Student	37	37
Lowest Score	64	84
Highest Score	75	100
Average Score	68.27	9073
N-Gain	0.73 (High)	

Based on Table 4, the results of the N-gain analysis are 0.73 and this result is included in the high category. So it can be said that there are improving students' abilities by learning to use Prezi learning media, with the increase is in the high category. The results use of a type of learning media in learning can effectively train skills and Skills. That's because it's not only visual that develops, but the auditory and kinesthetic also develop which is in line with combining cognitive, affective and psychomotor. So based on the results of the N-gain analysis, the developed Prezi learning media effective in improving students' scientific knowledge and skills. The results of this development research indicate that Prezi-based learning media is included in the validity practical, and effective categories. Prezi-based learning media can also be used in science learning to improve students' cognitive and explanatory skills on the theme of environmental pollution. Product development can be successful when the resulting product meets the criteria of valid, practical, and effective.

▪ CONCLUSION

Types of development research, especially in educational design. That the research development model used is the ADDIE model which aims to determine the analysis of observation, validity, practicality, effectiveness and evaluation. Based on the research, it can be said that the development of Prezi learning media deserves to be facilitated as follows teach science students by accessing the already shared link. E-modules can be used for improve cognitive and scientific skills in science teaching. Prezi learning media development is also included in the correct category with a validity score of 95%. The practicality of the e-module when used in learning, is included in the efficient category. Furthermore, the results of the Prezi learning media practicum are 95% which are included in the very practical section. Then the effectiveness of the e-module get the results of the N-gain analysis of 0.73 included in the high category. Furthermore, it would be better if it was done in several schools with different clusters so that the resulting data will be more representative understanding in each school cluster so that the quality of teaching the result will be better.

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