Development Of Etno-POE Multimedia In Science Learning Courses For Primary School Teacher Educations Program Students

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Abstract. This research aims to develop Ethno-POE multimedia, namely ethnoscience-predict, observe, explain in science learning for Primary School Teacher Education Program Students in science learning development courses in elementary schools. This development research was carried out using the four D (4-D) model, namely define, design, develop, and disseminate. Based on the results of the study, it was obtained that the feasibility aspect of the material content was obtained with a percentage of 88% in the very feasible category, the feasibility aspects of design and appearance of technology with a percentage of 89% in the very feasible category, and the practicality aspect obtained a percentage of 87.5% in the very practical category. Based on these results it can be concluded that the development of Ethno-POE multimedia is very feasible, practical and effective for use in learning science in primary schools

Keywords: Multimedia, Ethnoscience, POE

1 Introduction

A learning portrait is an illustration of how the learning process is carried out at school. As a place for the formation of knowledge, skills and attitudes, schools play an important role in creating a pleasant atmosphere. Evaluation in learning needs to be carried out to find out the extent of the success of the learning process that has taken place. As a form of process, of course it starts from optimal treatment so that the expected output from the realization of the process can be successful. The learning process must be able to adapt to conditions, student needs, and the environment around students so that students are no longer just recipients of information but active members and able to collaborate in education. Learning updates need to be carried out to adapt to the needs of the times. Seeing advances in technology and

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communication, teachers as implementers of the learning process need to implement adaptive learning that is able to apply an educational method that is able to implement technological advances in the learning process.

[1] in his research stated that the role of technology in the process of teaching and learning activities in elementary schools is able to make it easier to convey lesson material, it is easier for students to understand the lessons delivered by the teacher, and is able to make learning more effective so that students succeed in achieving a successful learning process. maximum. Learning in elementary school does not only contain one lesson, but consists of several subjects, either integrated or stand-alone subjects. [2] stated that based on observations made in learning, it was found that students' interest in science material tended to be less than satisfactory, the interactions that took place during learning tended to be one-way and they were not able to explore concepts and develop students' skills. Science learning actually requires students to be able to learn actively which can be implemented in physical or mental activities, not only including hands-on activities but also minds-on activities.

The basic concept in science is a basic applied science that aims to find the root of the problems of currently developing technology. Transforming technology in science learning can create students' interest in learning. This is in line with research conducted by [3] that information technology is able to increase children's interest in learning in elementary school, however there are other variables that influence science learning such as classroom management, comfortable classrooms, students' enthusiasm for learning and also class situation. How to create an active, joyful atmosphere and effective learning so as to foster positive character in science learning requires applying the concept of a fun science culture.

Culture in science can foster creative students, make the culture more productive, and build representation for science and technology communication in society. Science is very unique, because it is able to bridge the combination of culture in the surrounding environment or indigenous knowledge with scientific culture in schools or unique knowledge from a community or ethnoscience [4] In line with research conducted by [5] which states that focusing on preparing the future generation to understand science with curriculum content that pays attention to culture and daily life so that it is more contextual will improve science learning in elementary schools. In accordance with curriculum developments, science learning can be supported by connecting with local culture and wisdom in the local area [6].

One way to reconstruct cultural or ethnoscience-oriented scientific knowledge is to present interesting learning resources [7]. Presenting interesting or interactive learning resources can be implemented using multimedia in learning. According to [4], multimedia is a technology that combines various media sources such as text, graphics, sound, animation, video and so on which are delivered and controlled by a computer system interactively. The aim of applying multimedia is to present information in a form that is fun, interesting, easy to understand and clear. Information will be easy to understand, especially as all senses can be used so that they can absorb information better. Based on preliminary studies in the form of observations carried out by researchers in the science learning process, it was found that so far, students have only studied formally and have not been able to understand the environment with the various problems that exist around them, delivering or channeling messages from learning sources in a planned manner to students resulting in an environment conducive learning where the learning process can take place efficiently and effectively. This can be seen from learning that only focuses on the books provided, without any other sources being used to develop students' knowledge and skills. In their learning, students only read material from books, then make presentations, the material is rarely explained and delivered specifically by the teacher so interest in learning is very low. So researchers are trying to create an interactive multimedia development so that it can support students to learn more deeply about science and be able to connect it with the culture in the surrounding environment.

What strengthens researchers in conducting this research is that previous research provided teaching materials for basic science concepts, so it would be even more perfect if equipped with interactive multimedia, as a development of learning in basic science concepts courses. Judging from the results of the preliminary study from observations based on the mid-semester exam scores of class I 2022 PGSD students, it was obtained from 34 students who took the mid-semester exams in science learning courses, it was found that 58.9% of students succeeded in completing the science learning material well, while 41, 1% of students have not succeeded in completing the science learning material. With an average score of 51.2, it is felt that the concepts in science learning have not been implemented optimally so that the competencies expected by students have not been achieved.

From the text explanation above, it is felt that very important to develop lectures, through theories that are already in books and mastered by students, it needs to be developed by providing learning multimedia to increase students' interest in learning. So researchers want to

try to develop Etno-POE (ethnoscience-predict, observe, explain) multimedia in science learning. Multimedia Etno-POE is a learning aid that is able to bridge the culture that exists in the surrounding environment with the knowledge or scientific culture that exists at school. Based on the background above, the researcher raised the title: **"Development of Multimedia Etno-POE (Ethnoscience-Predict, Observe, Explain) in Science Learning in Elementary Schools".**

2 Method

The purpose of this research is to contribution in creating quality learning, so researchers are trying to create an optimal learning process by developing Etno-POE (ethnoscience-predict, observe, explain) multimedia in science learning for students. The location for this development research was carried out in the primary schhol teacher education program. The population in this study was taken from the total number of students in this program who took science learning courses in primary school, namely 12 classes, then sampling in the research will be carried out using a cluster random sampling technique.

The type of research used is development research with a 4D model. The 4D model was developed by consisting of 4 main stages, namely: 1) define, 2) design, 3) develop, and 4) disseminate.

3 Result and Discussion

The development of Etno-POE (ethnoscience-predict, observe, explain) multimedia was carried out to improve problem-solving abilities in science learning for PGSD students. This research, which was designed using a 4D (four-D) development model design, consists of several stages, 1) define, 2) design, 3) develop, and 4) dessiminate. Based on the research and development carried out, research results were obtained, namely the define stage was carried out in class J PGSD 2021 which became a guideline in developing multimedia Etno-POE (ethnoscience-predict, observe, explain). The activities carried out at this stage are analysis of lecturer needs and analysis of student needs. Analysis of lecturer needs is the initial stage carried out in developing Etno-POE (ethnoscience-predict, observe, explain) multimedia, namely by conducting an analysis of teacher needs which is carried out by conducting interviews with one of the science lecturers at PGSD related to the implementation of science learning. The interview results that have been obtained are used as guidelines in developing Etno-POE (ethnoscience-predict, observe, explain) multimedia.

The results of interviews that have been conducted relate, among other things, to learning outcomes in science courses, semester learning plans, availability of teaching materials and science learning media. Next, analyze student needs. Analysis of student needs is to determine student needs in learning science. Researchers distributed a questionnaire given using Google Form with the link: https://forms.gle/yzaxN4hPA7edaH118 which was filled in by 35 students related to science learning at PGSD. The response results obtained are as follows:

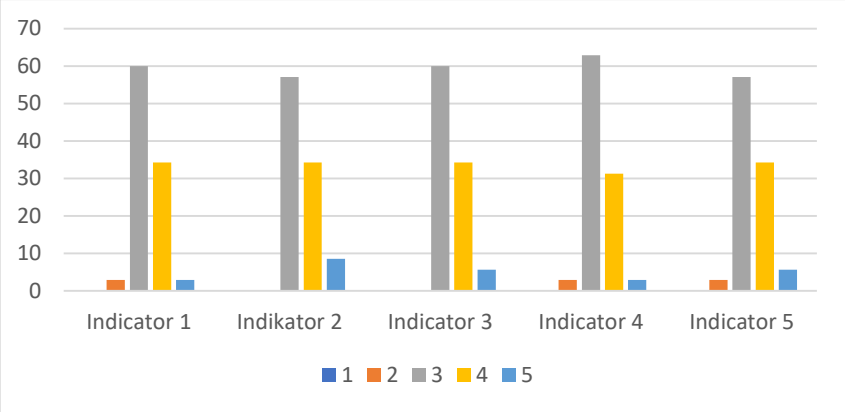

Figure 1. Diagram of Student Needs Related to Practical Guidelines

Based on the diagram above, the results of the student needs analysis questionnaire above, it is known that in indicator 1, namely student interest in learning science in elementary school, 2.9% answered that they were not interested in learning science, 60% answered that they were quite interested in learning science, 34.3% answered that they were interested, and 2.9% answered that they were very interested in learning science. Furthermore, in indicator 2, namely the availability of teaching materials in science learning, it was found that 57.1% filled in as quite available, 34.3% filled in as available, and 8.6% filled in as very available. Indicator 3, namely the usefulness of using learning media in science learning, was obtained by 60% answering quite useful, 34.3% answering available, and 5.7% answering very available. Then in indicator 4, namely the suitability of the designing a semester learning plan with science learning media, it was found that 2.9% were not suitable, 62.9% answered quite suitable, 31.3% answered it was appropriate, and 2.9% answered it was very suitable. Furthermore, indicator 5 related to the meaningfulness of science learning in improving students' skills was found to be 2.9% not yet meaningful, 57.1% quite meaningful, 34.3% significant, and 5.7% said it was very meaningful. The results of this analysis concluded that students stated that the science learning carried out was still in the sufficient category, namely

59.2%, so it needed to be developed. After define step is design stage. At this design stage the aim is to design Etno-POE (ethnoscience-predict, observe, explain) multimedia. The first steps are as follows: designing a semester learning plan. The semester learning plan that was developed refers to the 2023 Faculty of Education guidelines. Next, designing Etno-POE (ethnoscience-predict, observe, explain) multimedia. Next, at the development stage, the development stage aims to produce Etno-POE (ethnoscience-predict, observe, explain) multimedia. To explain the feasibility of the multimedia product that has been prepared, it is necessary to carry out the expert validation regarding the multimedia product, namely the media and material presented in the multimedia Etno-POE (ethnoscience-predict, observe, explain). To validate the material obtained as follows:

Table 1. Expert Validation Results of Content Eligibility

Aspect	**Result**	**Number**	**Maximal Score**	**Score**	**Clasiffication**
Components of teaching materials	In this aspect are still needs to be expanded with more references.	1,2,3	15	8	
Material Substance	Material substance prepared is in accordance with the learning outcomes of the science learning	4,5,6	15	16	
Physical Appearance	Good design, font, and picture able to increase the attractiveness of the students	7,8,9,10	20	18	
Total			50	42	**88% (Suitable)**

The validation of material experts for the development product given the suitbale category, the attractive design, material substance, and components of teaching materials are good.. Meanwhile, for media validation, the following results were obtained:

Table 2. Expert Validation Results of Media

Aspect	**Result**	**Number**	**Maximal Score**	**Score**	**Clasiffication**
Suitability of Teaching Materials	The suitablity between the material and the	1,2,3,4,5,6,7,8,9,10	50	48	

	design is good				
Flexibility	Easy to use	11,12,13,14,15,16,17,18	40	32	
Presentation	The design of presentation is good, the sounds , image and video presented are attractive	19,20,21,22,23	25	22	
Usefulness	Encouraging students are usefullnes to develop thinking skills	24,25	10	8	
Total			125	110	**89% (Suitable)**

From the results of the expert validation from material and substance, the development product has met the assessment criteria, and what is available is suitable. Several things that need to be developed related to more depth in the material.

4 Conclusion

From several stages in the development research carried out. Based on the results of the feasibility test carried out by material experts, the material validation results were 88% in the good category and from the validation results from media experts, the media validation results were 89% in the good category, so it can be concluded that Etno-POE multimedia can improve learning in the eyes. science learning lectures in elementary schools

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