DESIGN OF M-LEARNING BASED ON HOME SCIENCE PROCESS SKILL FOR SCIENCE LEARNING

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ABSTRACT

Instructional media that are innovative and easy are really needed by students in the current situation. M-learning based on Home Science Process Skill (HSPS), is an innovative learning medium that applies science learning directly in life, with the guidance of parents at home and teachers. The study aims to produce design of m-learning based on home science process skill for science learning. This research was conducted in April 2021 at SMPN 30 Kota Tangerang. The method used was the Research and Development (R&D) research method with the Instructional Development Institute (IDI) model. The stages of research and development of learning media were to define stage, develop stage and evaluate stage. The results of the feasibility test for the design of m-learning based on Home Science Process Skill by media experts and material experts obtained an average assessment of 78.40% and 87.50% with good and very good interpretations. The conclusion of this research was that the design of this learning media was feasible to be used as a medium for student learning media.

Keywords: M-Learning, Home Science, Process Skill, Science, Biotechnology

INTRODUCTION

The current state of the Covid-19 pandemic is one of the changes in the education system that changes the learning process from face-to-face to online or distance learning. Many policies emerged due to the Covid-19 pandemic. Educational activities and the learning process become a big problem, because there are many activities that are not sufficient theoretically but also practical. This situation changes actions that should be carried out directly or face to face between educators and students and are limited (Zulhafizh & Permatasari, 2020).

The existence of this situation becomes a challenge for teachers and students who require the learning process to change by doing new things to deal with it. For the first time, teachers are learning online by using a variety of new learning media to adjust to the learning process.

One of the changes or developments in the learning process that needs to be considered is the use of mobile learning. Mobile learning is a learning medium that

uses smartphones or other devices as a medium for delivering information on learning materials to support the learning process (Sutiasih & Saputri, 2018).

So we need a learning media as a tool to overcome the difficulties of implementing learning in class, given the limited time in the learning process in the classroom. The development of mobile learning is effectively used for learning in the classroom (Rahmawati & Mukminan, 2018). Mobile learning has the potential to gain wider acceptance in education that complements classroom learning (Sasongko, Widiastuti, & Harjanto, 2017).

The development of mobile learning or m-learning media is very practical, valid and effective to improve learning outcomes (Sumiati, Rizal, & Anwar, 2020). The development of mobile learning allows teachers to conduct learning more effectively. Students who use mobile learning are also challenged to use it better (Sulisworo, Ishafit, & Firdausy, 2016).

Natural science is one of the lessons that should be based on everyday life. However, when viewed, students describe science as the study of certain things with the final grade they will get. Home Science Process Skill (HSPS), is a structured combination of learning material that elaborates familiar science process skills in everyday life and can be done by students at home with teacher guidance (Airlanda, 2016). Efforts to develop students' science skills are not only through the learning process in the classroom but can also be done through various activities outside the classroom and anywhere, one of which is by using the Home Science Process Skill (HSPS). Students who use learning with the Home Science Process Skill respond positively and well to work from school to do at home (Novitasary, Cahyani, & Mulyani, 2018).

With this condition, a solution is needed to overcome and accommodate all aspects that exist in science learning. Therefore, it is necessary to design of m-learning based on Home Science Process Skill (HSPS) for science learning.

METHOD

This research was conducted in April 2021 at SMPN 30 Kota Tangerang, class IX, even semester of the 2020/2021 school year, on the basic concept competencies and the role of biotechnology. The method to be used in research and development (R&D) is the Instructional Development Institute (IDI) development model, on the basis of the consideration that the model is suitable for developing m-learning learning media based on Home Science Process Skill (HSPS), right on target, effective, dynamic and very helpful (Ampera & Sari, 2014). The steps of this research and development process are as follows:
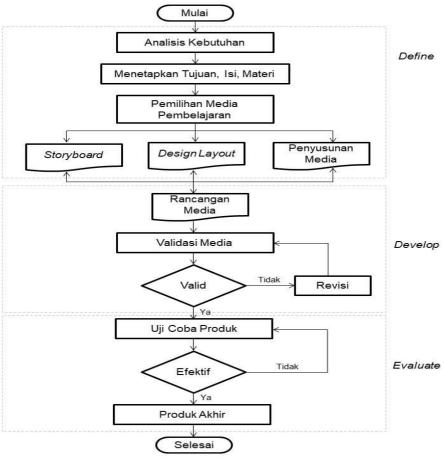
Figure 1. Flowchart of M-Learning based on Home Science Process Skill

RESULTS AND DISCUSSION

Based on the results and discussion of the research design that has been carried out on m-learning design based on Home Science Process Skills in Science Learning, the following results are obtained:

The define stage, carried out a needs analysis of students and interviews with one natural science subject teacher. The results of the recapitulation of the student needs analysis showed that 70% of students had difficulty understanding science learning materials during the Covid-19 pandemic and 30% of students had no difficulties. Students need learning media that is attractive and can be applied in everyday life, 81% of students are interested in and support the development of the design of m-learning learning media based on Home Science Process Learning in natural science learning. Of the eight natural science learning materials provided, 54% of students chose interesting Biotechnology learning materials to be developed and designed in the science-based process of everyday life. The natural science teacher interviewed explained that in learning biotechnology during this pandemic, the teacher had difficulty explaining it to students to apply it in life. Curriculum analysis is carried out to determine the basis for the design of objectives, content, materials and selection of m-learning media based on the Home Science Process Skill. Curriculum analysis also includes material organization that refers to four main sub-discussions, namely the development of biotechnology, its application in life, the impact of application and development, and plant cultivation techniques.

Furthermore, at the develop stage, the design of m-learning learning media based on Home Science Process Skill was carried out. Figure 2 below is a Home

Science Process Learning (HSPS) based m-learning flowchart designed for a smartphone application.
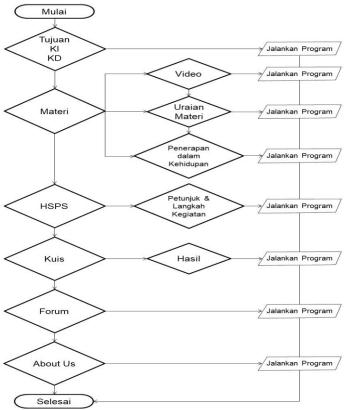

Figure 2. Flowchart of M-Learning Based on Home Science Process Skill

The m-learning format is adjusted to the required learning, consisting of a learning menu with sub-materials. Each lesson consists of an introduction menu, namely objectives, core competencies and basic competencies. Then enter the main material menu to be discussed. In the menu the material is divided into three parts, namely in the form of explanations with videos, material descriptions and examples of learning in their application in life. Furthermore, there is the Home Science Process Skill (HSPS) menu, which contains instructions and steps for student activities based on daily life. In science process skills that are carried out at home with the guidance of teachers and parents, as explained by Wahyuni, Indrawati, Sudarti, & Suana (2017) that in these activities what is measured includes learning activities in observing, grouping, interpreting, predicting, asking questions, planning experiments, using material tools, applying concepts, and communicating learning outcomes.

The quiz menu contains questions and questions to deepen previously studied material. The forum menu is used for students to discuss learning that has been implemented. Discussion is very necessary in learning, this is in accordance with the opinion Fatmawati (2019) that the existence of discussion forums on mobile learning can increase student participation compared to discussions that occur in class conventionally or classically face-to-face. The last menu is about us which contains the identity of the m-learning designer.

Furthermore, in the validation of the product test design, the design was revised by media experts and learning material experts. Expert analysis on a series of m-learning instructional media product designs based on Home Science Process Skills

is carried out by asking for input from media experts and material experts. The results of the media expert's due diligence are presented in Figure 3 below:
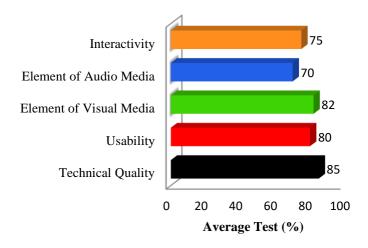

Figure 3. Average Test Results of Media Experts

Based on the quality evaluation data, the technical quality assessment aspect with indicators of portability, installation, smooth operation, and documentation obtained an average score of 85% with good interpretation. The usability assessment aspect with the consistency indicator average score is 80%. The aspect of assessing visual media elements with indicators of document text, alignment of text and background colors and illustrations consisting of images, videos, or animations gets an average score of 82%. In the aspect of assessing audio media elements with narrative indicators, sound effects, and background scores an average score of 70%. Whereas in the aspect of assessing interactivity, it got a score of 75%. Overall aspects of the assessment by media experts get an average score of 78.40% with a good interpretation, which means that it is suitable to be used as a learning medium.

In addition to the due diligence of media experts, a due diligence of material experts is also carried out. The results of the due diligence of material experts are presented in Figure 4 below:
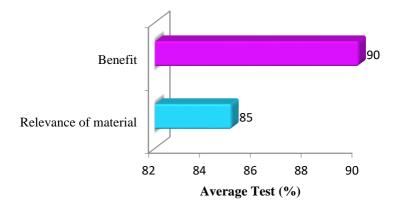

Figure 4. Average Test Results of Material Experts

The results of the feasibility test for material experts on the aspect of evaluating the relevance of the material consist of indicators of material suitability, suitability of material with objectives, suitability of material with competence, completeness of material, material order, writing format, accuracy of image selection, musical

illustrations, easy to understand component images, video accuracy, material and material clutter related to application in life, obtained an average score of 85%. Meanwhile, in the aspect of benefit assessment, an average score of 90% was obtained. Overall aspects of the assessment by material experts get an average score of 87.50% with a very good interpretation, which means that it is very suitable to be given to students.

The results of the feasibility test for media and material experts as a whole obtained an average rating of 78.40% and 87.50% with good and very good interpretations. In accordance with the opinion of Darmaji, Kurniawan, Astalini, & Ria (2019) that m-learning media with a good percentage can support the learning process. According to Fatmala & Yelianti (2016) if the results of the feasibility of the media are in the very good category, then the learning media can be used as a means of independent learning that can be used by students.

Meteri experts also state that the advantages of designing m-learning learning media are very interesting and different from other learning media, because they are based on everyday life, learning media rarely apply it directly in life, usually only fixated on theory and results. This is in accordance with the opinion of Permana & Sari (2018) that science learning is not just knowledge about facts, concepts, and theories, but must also be meaningful in student life so that it makes students curious about the learning.

Although getting the results of the due diligence day of the experts is good and very good, there are several parts that must be improved so that the design of m-learning learning media based on Home Science Process Learning can be more perfect and developed even better. In the design of m-learning media based on Home Science Process Skill, it is carried out only until the develop stage is not continued with the evaluate stage, this is due to the limited time of the research. So further research is needed to develop the design of m-learning media based on Home Science Process Skills to perfect this research.

CONCLUSION

Based on the results of research and discussion, the design of m-learning based on Home Science Process Learning in science learning has been successfully designed and gets a good interpretation value. The design can be used as the development of learning media for students as a means of independent learning. Suggestions that can be used to improve and perfect this research, namely, further research is needed to determine the effectiveness of the application and development of m-learning based on Home Science Process Learning towards understanding the basic concepts and role of biotechnology in learning, as well as a longer time for further research.

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