Implementation of the Science Mobile Learning Application for Solar System Material for Class VI Emereuw Jayapura Elementary School

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Abstract

The urgency of PNBP community service in 2024 is that teachers need to implement mobile learning applications as interactive multimedia learning media for science on solar system material for grade VI elementary school students. This is necessary because students find it difficult to understand the solar system subject matter and do not know what planets are in the solar system using textbook teaching materials and students get bored quickly and are less interested because students only imagine the solar system based on the teacher's explanation on the board. The purpose of this community service is the transfer of science and technology to implement mobile learning applications as interactive multimedia learning media for science on solar system subject matter for grade VI elementary school students. Community service activities are carried out using lecture methods, discussions, questions and answers, demonstrations and practices for using mobile learning applications for science, as well as evaluation of community service activities. The targeted output is that elementary school students can use interactive learning media for mobile learning applications for science to improve the quality of learning solar system material and the results of community service activities in the form of articles published in community service journals.

***Keywords**: Application, Solar system, Mobile Learning, Elementary School, Android*

INTRODUCTION

Education at elementary school level, students learn various kinds of knowledge, attitudes and skills. One of the important subjects in grade VI elementary school (SD) is natural science (IPA). Science subjects are knowledge that includes mastery of a set of facts, concepts, principles, theories, and mastery of the discovery process. The learning process places greater emphasis on direct experience with the aim of developing environmental understanding. Natural science learning regarding the solar system at SD Negeri Emereuw Jayapura is still carried out traditionally, namely the teacher explains on the blackboard, explains the solar system learning material to the students along with the pictures in the printed book, and the students ask the teacher and write the lesson material in the notebook. Students feel bored with the traditional teacher-centered learning process, and teachers do not create interactive science learning media as an innovation in modern learning models so that students are not motivated and interested in learning. If students study at home and there is science lesson material at school that the students do not understand and the students forget to write the teacher's explanation, then the students will have difficulty solving the problem. The science subject matter of the solar system is difficult for students to understand using the traditional learning model using printed book teaching materials because it requires visualization of the planets, sun and other celestial bodies and students tend to feel bored quickly and are less interested because students only imagine the solar system based on the teacher's explanation on the blackboard. This makes it difficult to provide maximum understanding to students, such as the example of the movement of planets which revolutionize while rotating.

With the development of information and communication technology, it is necessary to have independent learning media and make learning more interesting. Android-based mathematics learning application training at Abepura Adventist Elementary School was successful and increased students' learning motivation. Teachers and students show high interest in this application, as evidenced by their enthusiasm and active participation. Students enjoy learning and doing practice questions using the application (Wororomi et al., 2024). Usage media learning mobile learning is more effective and efficient on education base, because can increase interest Study student, motivation, and help student

understand material Which delivered by Teacher with easy. Android-based applications can be used as a means of learning natural science materials for studying the solar system. The development of Android-based interactive mathematics learning media developed with Articulate Storyline 3 software is able to improve class VII students' understanding of integer material and mathematical multiplication [1]. Mobile learning applications are a unique learning medium because students can access learning materials, tutorials and applications related to learning materials anytime, anywhere without being limited by space and time. Additionally, mobile learning can allow students to study alone or with friends. The presence of mobile learning can complement existing learning. Android-based mobile learning also provides students with the opportunity to repeat material they do not yet understand. The application of the Edmodo E-learning application for online learning at Abepura Adventist Middle School, Papua is used as a learning medium that is relevant, interesting and not boring for students [2] . The use of interactive learning media with Smart Apps Creator helps teachers in teaching students in the current era. The development of Android-based learning media using Smart Apps Creator aims to help effectiveness and efficiency in the teaching and learning process. This learning media is interesting and helps students to understand and find out to what extent they understand the material provided, thus making students happier and more enthusiastic in learning mathematics [1] .

Learning media is an important factor in the process of teaching and learning activities to achieve success in the learning process at school. The learning process cannot run optimally if it is not supported by learning media, because media functions to make it easier for educators and students to interact in teaching and learning activities. The solar system application is designed as a learning tool that can be accessed offline on Android devices. This media offers practicality and effectiveness because it can be used anytime and anywhere, thus providing more flexibility for students in learning. After using this application, students' understanding of the material increases [3]. Procurement of learning media is very necessary to increase students' interest in learning science material [4].

IMPLEMENTATION METHOD

UNCEN PNBP service activities in 2024 for Emereuw Jayapura Public Elementary School students, carried out for the application of science and technology (IPTEK) regarding the application of applications *mobile learning* Solar system science as an interactive learning medium. This activity is carried out using lecture methods, discussions, questions and answers, demonstrations and practice in using application learning media *mobile learning* Solar system science, as well as observation and evaluation of the results of service activities.

The service activities have been carried out in 5 stages, namely the first stage is coordinating with Emereuw Jayapura State Elementary School teachers, the second stage is socialization about interactive learning media application training *mobile learning* Solar system science, third stage of training and practice in using interactive learning media applications *mobile learning* Solar system science, the fourth stage is evaluation of training in the application of science and technology, and the fifth stage is reporting. The stages of implementing community service activities are shown in Figure 1.

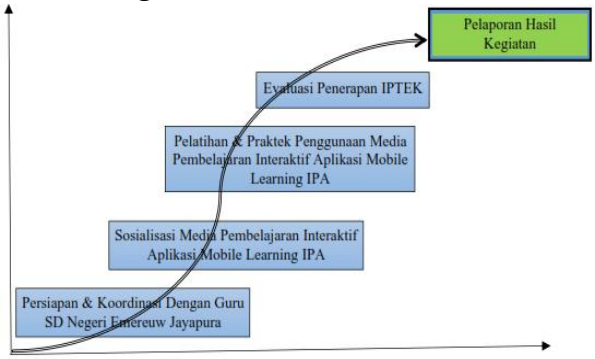


Figure 1. Stages of Implementing Community Service Activities

RESULTS AND DISCUSSION

Service activities for Emereuw Jayapura State Elementary School students, held on September 16 2024 for the application of science and technology (IPTEK) regarding the application of application *mobile learning* Solar system science as an interactive

learning medium. Activities have been carried out using lecture methods, discussions, questions and answers, demonstrations and practice in using application learning media *mobile learning* Solar system science, as well as observation and evaluation of the results of service activities. Several previous studies have become references regarding Android-based mobile learning media which have been applied in various educational contexts as new innovations that are more effective in improving the quality of learning. Using an Android-based mobile application with a flipped classroom model can improve the quality of learning in the era of industrial revolution 4.0. The application of this innovation at the 1945 Kupang Teachers' Association University shows that students are more actively involved in the learning process, have control over their learning, and experience deeper learning [5] . Developing an English vocabulary mobile phone application can increase understanding, motivation and learning independence for students at Adventist Elementary School, Abepura, Papua. This application is expected to make learning more effective, creative and flexible anytime and anywhere [6] . Development of learning media IPA through applications Augmented Reality**,** is an alternative solution so that students can be skilled in using it *smart phone* as a science learning medium and students do not feel bored during the learning process. The research discusses the use of applications Augmented Reality as a learning medium to increase students' learning motivation, especially in science subjects about the solar system. Teachers in the digital era need to have good skills to become inspiring educators. Augmented Reality allows students to get to know objects interactively without having to see them directly, just by scan flashcards so that the object looks real [7]. According to [8], learning media is the main and most dominant factor for the success of the teaching and learning system. Learning media that is integrated with the culture of a region is an important means of transferring material and preserving culture. This research aims to develop Integrated Digital Mathematics Learning Media for Malay Culture. Another research on an Android-based virtual reality box application designed to make it easier for teachers and students to learn about the solar system by providing 3D visualization to students. This application can be used without an internet connection, so it is more practical and can be used by students at any time [9]. Development of interactive multimedia applications *Smart Apps Creator* Smartphone-based learning in elementary/MI can be utilized in the teaching and learning process with the theme of space exploration. This application is interesting to use in learning because it presents animations, videos, audio, images, quizzes, as well as instructions for use that are clear and easy for students to understand, thus increasing students' interest in participating in learning [10].

Application deployment *mobile learning* as a science learning medium for solar system learning material can be a solution problem for grade VI Emereuw Jayapura State Elementary School students. Instructional Media *mobile learning* The solar system makes it easier to convey learning material, makes the boring learning process interesting, and clarifies the delivery of the material with real examples. Presenting learning material in the form of interactive multimedia (audio, video, text, animation) makes the visualization of solar system learning material interesting and easy for students to understand. With the existence of learning media technology, it can improve the quality of science learning and support learning programs in elementary school education environments to create a more creative, effective and interactive learning atmosphere. Figure 2 shows the initial appearance of the IPA SD Mobile App application.

Figure 2. Initial appearance of the IPA Mobile App

Figure 3 below shows the menus learning material in the application *App Mobile IPA* which includes the solar system, sun, planets, other celestial bodies and practice questions.

Figure 3. IPA Mobile App Aging Display

Figure 4, figure 5 and figure 6 show part of the solar system learning material in the application *mobile learning* as an interactive learning media that can help grade VI Emereuw Jayapura State Elementary School students to understand the actual situation that occurs in the solar system without having to guess at the description of the material presented, so that the reflection will be embedded in the child's memory.

Figure 4. Planets and their positions relative to the sun

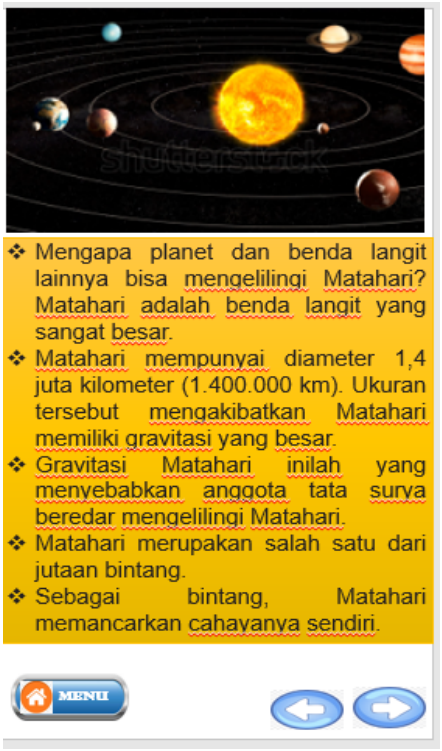


Figure 5. Planets and Celestial Bodies Around the Sun

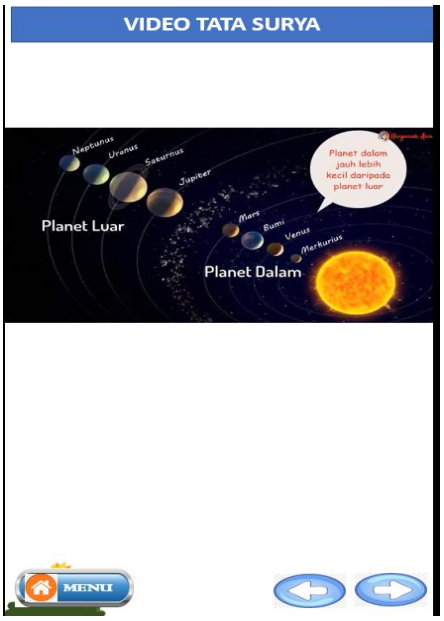
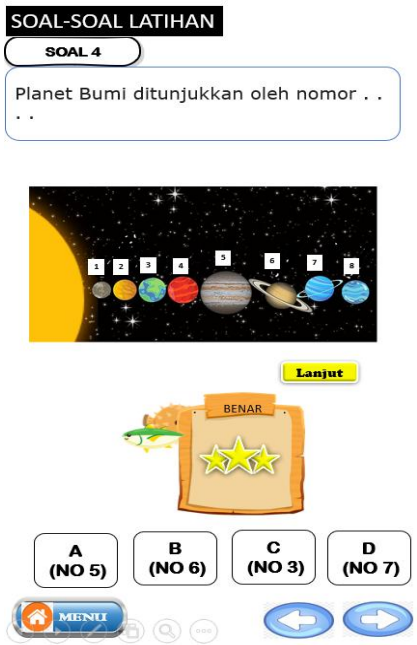


Figure 6. Video Explanation of the Solar System

Figure 7 shows the practice questions in the application *App. Mobile IPA*. This is necessary to evaluate students' abilities and interest in the application *App. Mobile IPA* in understanding science learning material, solar system sub-subject material.



Picture 7. Exercise Questions

CONCLUSION

Cenderawasih University's PNBP service activities through the implementation of interactive learning media, science mobile learning applications on solar system material for 6th grade elementary school students, have been carried out well for the transfer of science and technology to students at Emereuw Jayapura State Elementary School as service partners. The results of service activities are that students are interested and motivated to learn to use the application *App. Mobile IPA* Android based to increase knowledge and skills in learning science sub-material using the solar system *smartphone*. The learning materials contained in the application are named applications *App. Mobile IPA* namely Planets, Sun, Other Celestial Bodies, and practice questions.

SUGGESTION

Technological advances in the digital era, including learning media technology, need to be applied to schools in order to improve the quality of education and innovation for teachers to create an interesting and interactive learning environment so that students are motivated and active in learning independently.

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