Devleopment of Science Learning Application for Junior High School Students: Literature Review

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ABSTRACT. Learning applications are software specifically designed to provide interactive learning experiences, either for formal or informal educational purposes. This study aims to understand the effectiveness, teaching design, relevant learning models, suitability to the curriculum, use of technology, and challenges that may be faced. This study uses a systematic literature review method following the PRISMA guidelines. The study shows that science learning in junior high schools generally uses the R&D method, especially in grade VII, with various ethnoscience teaching materials such as science modules. This reflects a great interest in the development of science learning. Science understanding is also important in the development of Android technology , with concepts of physics, chemistry, and biology applied in Android application features.

Keywords: *Science Learning Application, Literatur Review*

INTRODUCTION

Ki Hajar Dewantara, the father of Indonesian national education, defined the concept of education. "Education is very important for the growth and development of children, because education brings out all the inherent power in children so that they can obtain the greatest security and happiness as humans and members of society as the humanization of humanity. must enable us to respect the human rights of all people.

Education is the most important thing in human life. This means that all Indonesian people have rights and are expected to continue to develop. Education never ends. Education in general means the process of life where every individual grows to live and live life. Therefore, being an educated person is very important.

Natural science is the science that studies living things and all their life processes. Natural science or often called natural science is the science that studies the disclosure of secrets and natural phenomena, including the origin of the universe and all its contents, including processes, mechanisms, properties of objects and events that occur. The knowledge obtained from this universe is then the basis for the development of natural science (IPA). IPA is a body of knowledge formed from a continuous inquiry process and carried out by people working in the field of science.

In the context of science learning, it is actually not much different from the concept of learning other subjects, only the emphasis must be in accordance with the nature of science itself, that learning science must involve a scientific process, producing scientific products by conducting experiments/trials and the formation of a scientific attitude.

In the era of globalization, the need for information is very high, and the presentation of information is required to be fast and accurate. At this time, information is one of the main needs of society in this modern era. One of the media that can be a facility to obtain information quickly and accurately is the internet.

Rapid technological developments require education to be in line with technological advances. Android is an operating system that is widely used because it has features that are easy

for users to understand. In addition, Android itself is an operating system used for Linux-based mobile devices that include operating systems, middleware, and applications (Putra, 2016) .

In conducting a literature review for the development of science learning applications for junior high school students, the main focus is to understand the effectiveness, teaching design, relevant learning models, suitability to the curriculum, use of technology, and challenges that may be faced.

METHODS

This study used a systematic literature review method following the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. This method involves reviewing clearly stated questions, using systematic and explicit methods to identify, select, and critically appraise relevant studies, and collecting data from existing studies to be included in the review. This method focuses on collection and analysis (Moher et al ., 2010).

The main research intuition is that the selection of articles to be included or excluded in a literary work involves inclusion and exclusion criteria (Hidayat & Hayati, 2019) . The intuitive author of this article uses the results of data searches using these criteria. The inclusion and exclusion criteria in this literature are shown in Table 1.

Table 1. Inclusion and exclusion

Inclusion Criteria	1) Research articles published in 2014-2024.
	2) Research topics include science learning application.
	3) The research subjects are generally junior high school students.
Exclusion Criteria	1) Research articles that cannot be accessed in full.
	2) Literature from the scholarly web.

After identifying the inclusion and exclusion criteria, the next step is to select the articles to be reviewed(Hadi et al., 2020). This is a chart of the process of selecting an article as shown in Figure 1.
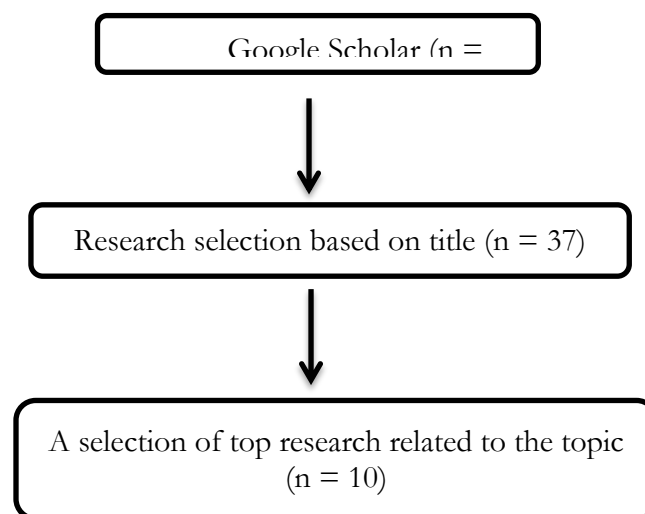

Google Scholar (n =

Research selection based on title (n = 37)

A selection of top research related to the topic (n = 10)

Figure 1. Articles Selection

RESULT AND DISCUSSION

Learning applications can be used in science learning in several discussion topics, because some materials cannot be learned just by reading the material. During face-to-face learning or offline learning, teachers can usually provide media directly that is already available at school as learning media. But in online learning, the existing media is less effective to use. The existing media can only be used during face-to-face learning, because the nature of the media is that it cannot be used anywhere. Different from mobile learning applications. Mobile learning is an alternative for developing learning media.

The development of learning media cannot be separated from the role of learning technology: theory and practice in the fields of design , development , use, management, evaluation of learning processes and resources. In learning technology , the relationship between domains is synergistic, so that the development of mobile learning media does not only focus on the development of the domain or the scope of the domain, but can also benefit from the theory and practice of other domains.

After conducting an article search via Google Scholar, 10 clinical articles were found published between 2014-2024, which were analyzed in Table 2.

Table 2: Characteristics of the Analyzed Articles

NO.	Author & Year	Research methods	Class	Material
1.	(Dhaniawaty, 2021)	ADDIE	VII	Human Digestive System
2.	(Fitriani & Negara, 2021)	ADDIE	VIII	Human Movement Organs
3.	(Permatasari, 2022)	R & D	VII	Classification of Matter and its Changes
4.	(Ibrahim, 2017)	R & D	VII	Human Excretory System
5.	(Sabir, 2022)	MDLC	VII	Solar System
6.	(Sujalwo, 2017)	R & D	VIII	(1) Movement of objects and living things; (2) Skeletons, muscles, and simple machines; and (3) Structure and function of plants.
7.	(Fatmawati & Hala, 2020)	R & D	VII	Human Movement System
8.	(Puspa et al., 2019)	R & D	VII	-
9.	(Kelana et al., 2021)	qualitative descriptive	-	-
10.	(Antika et al., 2022)	Quasi Experiment	VIII	-

Based on the analysis results from table 2, there are 10 articles discussing the Development of Science Learning Applications for Junior High School Students. The results of the analysis show that the study uses the Research and Development, Addie, MLDC, qualitative descriptive and Quasi-experimental methods. The percentage of the use of research methods can be seen in Figure 2.
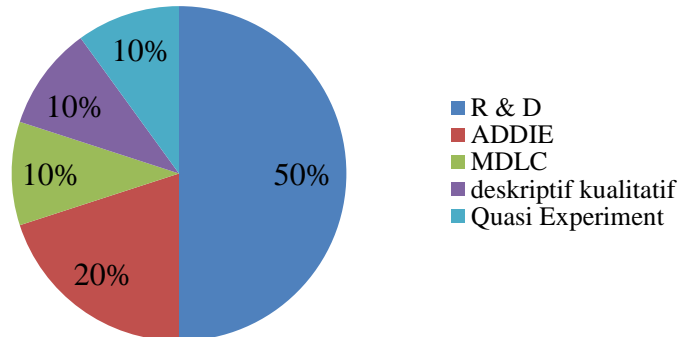

Figure 2. Research Methods

Based on Figure 2, it can be seen that the research method that is widely used is the Research and Development (R & D) method with a percentage of 50%. Then ADDIE 20 % and qualitative descriptive, MLDC, Qualitative Descriptive each with a percentage of 10%.

Research and development methods are often used in ethnoscience-based teaching materials in junior high school science learning because they allow integration between local knowledge and scientific concepts, producing teaching materials that are more relevant to students' contexts and encouraging a deeper understanding of the relationship between science and local culture, which in turn can increase students' interest and engagement in science learning.

The next thing that can be analyzed from the findings of the article is the class that was the target of the research. The class percentage can be seen in Figure 3..
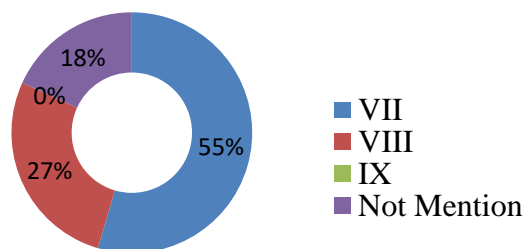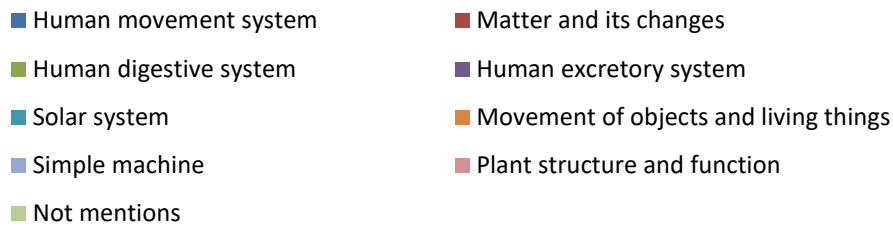

Gambar 3. Class Data

Based on Figure 3, it can be seen that the class that was most targeted in the research was class VII with a percentage of 55%. Next, class IX has a percentage of 0%. In the analysis, there is also research that does not have a class target with a percentage of 18%. Then the class percentage is 27% for class VIII. No articles were found discussing class 9 because the material taught is almost the same as the previous class so that more writers found discussions on class 7.

Next, there are several forms of material discussed in the articles found. The percentage of material using the application can be seen in Figure 4.

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Figure 4. Material

■ Human movement system
■ Matter and its changes
■ Human digestive system
■ Human excretory system
■ Solar system
■ Movement of objects and living things
■ Simple machine
■ Plant structure and function
■ Not mentions

Based on Figure 4, it is known that the form of material that uses the most applications is the motion system with a percentage of 20%. Then for the identified there are 20%. While for the materials and styles, the human digestive system, the human excretory system, the solar system, the movement of objects and living things, simple machines, and finally the structure and function of plants have a result of 10%.

The following is a trend based on VosViewers analysis shown in Figure 5.
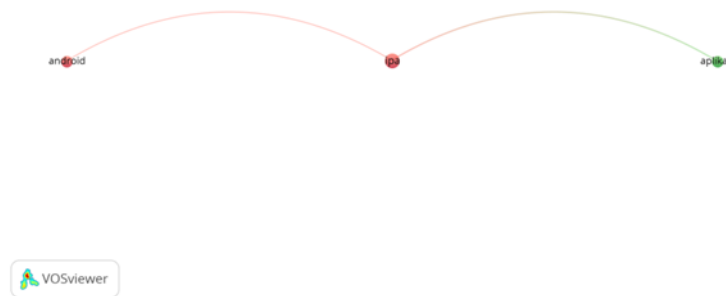

Figure 5. Issue Trend

The results of the reviewers highlight the relationship between Natural Science (IPA) lessons and Android and the application highlights the important role of IPA in the development of Android technology. Science is not just a subject in school, but also a conceptual foundation that underlies advanced technologies such as Android and the applications created for it.

First, understanding IPA helps in understanding the basic principles underlying Android technology. Physics concepts, such as the use of sensors to measure acceleration or rotation, form the basis for features such as gesture recognition, GPS navigation, and health monitoring in Android apps. Likewise, chemical principles play a role in understanding battery power, which is an important aspect in developing energy-efficient applications.

Second, the relationship between science and Android applications can be seen in the implementation of science concepts in application features. For example, computer science concepts such as data structures and algorithms, which are taught in science lessons, are applied in the development of Android applications to organize data, process information, and provide appropriate responses. Likewise, biological concepts are utilized in the development of health applications, for example to recognize sleep patterns or monitor heart rate.

In conclusion, the relationship between IPA and Android and applications cannot be ignored. A solid understanding of IPA concepts provides a solid foundation for developers to understand, design, and implement advanced features in Android applications. Thus, science learning is not only important in the context of education, but is also an inseparable foundation in the development of Android technology and its applications.

CONCLUSION

The conclusion of these sentences is that research in the development of Natural Science (IPA) learning at the junior high school level generally uses the Research and Development (R&D) method, with a focus on grade VII and using a variety of ethnoscience-based teaching materials such as science modules. The use of these teaching materials reflects a significant interest in the development of science learning at the junior high school level. In addition, understanding science also plays an important role in the development of Android technology and applications, with the concepts of physics, chemistry, and biology applied in the basic features and principles of Android applications.

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