

Needs Analysis of Physics Learning Media Integrated Local Wisdom

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Abstract

Indonesia is a country that is rich in cultural diversity, but it is starting to fade along with technological developments. Preservation of local wisdom is needed, one of which is by integrating it into physics learning. This study aims to analyze the needs of physics learning media integrated with local wisdom in schools. The research method used is a qualitative descriptive research method, namely by conducting a needs analysis. The research was conducted in September 2022 - October 2022 at SMA Labschool Unesa 1 Surabaya. The research results show that the learning media used are not varied. Teachers have not played a big role in developing learning media, especially related to local wisdom or culture around them. This research is expected to explain the concept of physics that can connect modern science with ethnoscience in traditional games and can be used as physics learning materials.

Keywords: Learning Media, Physics, Local Wisdom

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INTRODUCTION

Development of technology and information has progressed so quickly that it is not undeniably has caused a number major changes in society especially in the world of education in need technology as a means of support learning process The use of technology in the current digital era requires teachers to have ideas and innovations regarding learning media used in classroom learning. The fact that the use of learning media in schools is still not fully using interactive learning media. The use of media in learning has undergone many changes starting from its initial form in print, now there are many learning media in digital and online forms (Ichsan, 2018). Changes in the use of instructional media should make teachers start utilizing digital media today for alternative means of delivering material to students. (Christ, Arya, & Chiu, 2017). Many schools have used electronic media as a tool to support learning in schools. One of the digital-based schools is SMA Labschool Unesa 1 Surabaya. All students are required to have a tablet to use as the main learning medium at school.

Learners no longer need to carry lots of books because there are already many applications available that facilitate learning. In addition, now there are many e-books available that are easy to carry anywhere, which reduces the use of printed books (Muthukrishnan & Kelley, 2017). There are many forms of innovation that can be carried out by teachers such as developing teaching materials, learning media, lesson plans and student worksheets. All of these developments lead to one goal, namely to improve students' abilities both cognitively, affectively and psychomotor (Van der Veen & van Oers, 2017). Physics learning is one of the subjects that is very influential in the development of science and technology (Setiawan, 2012).

Indonesia is famous for its various cultures, and without realizing it, each culture has a different charm. Within the culture itself, there is science that is not widely known by people, besides that local wisdom from several different regions can be used as a source of learning in the field of science. So far, science learning, especially in the field of physics in schools, still partially refers to teacher and student handbooks, where handbooks contain science products in the form of facts, concepts, principles, theories, and laws and their application in the context of everyday life (Wulansari & Admoko, 2021).

Physics is part of science knowledge that is closely related to problems related to observed natural phenomena based on experience and facts. Natural phenomena that exist and develop from society are called ethnoscience. Ethnoscience is an activity of transforming between the original science of society and scientific science. Ethnoscience is knowledge that is owned by community groups. The emphasis is on original and distinctive knowledge from a community culture (Suprpto, Prahani, & Cheng, 2021). In other words, ethnoscience is a branch of cultural studies that seeks to understand how native peoples perceive their nature (Suprpto, Prahani, & Deta, 2021). Original science is reflected in local wisdom as an understanding of nature and culture that develops among the people. The social and cultural conditions of a society foster patterns of thinking, attitudes, and behavior which are often referred to as cognitive, affective, and psychomotor patterns (Aji, 2017).

Facts from previous research by Meilana & Aslam (2022) show that many teachers still use teaching resources such as government textbooks and teaching materials, as well as published products that are not in accordance with the learning environment of students. This situation causes students to find it difficult to understand the concept of the material presented. Learning materials available in schools do not prioritize cultural and environmental factors native to the local community. Thus, teachers as educators should be able to modify teaching materials by conforming to local culture and the environment in society. Integrating local wisdom in contextual learning will certainly help students understand physics concepts. Satriawan (2016) states that conceptual understanding can be interpreted as students' ability to understand meaning scientifically, both theoretically and its application in everyday life.

Understanding of the concept is part of the results in the learning component. Thus, understanding the concept is part of the learning outcomes in the cognitive domain. Cognitive learning aims to improve students' understanding of the concepts being studied. The available teaching materials are also still a little related to local culture. This is very important to include in the learning process by making materials that contain local cultural content. So that a source or supporting teaching material is needed as a teaching tool that contains elements of local wisdom. Currently learning physics is still a little applied to physics concepts related to phenomena that exist in life, so it can be said that it is still not contextual which is still fixated on the contents of the book and lack of exploration in the surrounding environment (Nugraha & Prabowo, 2022).

In line with the research of Astuti and Bhakti (2021) states that the local culture of traditional top games is a form of traditional games that can be applied in learning at school, one of which is in physics. This is also supported by research by Meilana and Aslam (2022) who argue that using local wisdom based teaching resources can provide real experience because in addition to introducing regional local wisdom and efforts to preserve regional local wisdom, it also makes it easier for teachers to connect the material explained with circumstances or conditions, environment around. Based on previous research, there is research that discusses the exploration of the concept of physics on the local wisdom Kekehan. Local culture based physics learning activities also have a close relationship with students' scientific literacy abilities, especially in terms of obtaining information and train two-way communication skills between teachers and students. interviews and student response questionnaires were analyzed descriptively.

METHOD

This research is a qualitative descriptive study. In this study, an analysis of the needs of learning media was carried out. The analysis was carried out thoroughly regarding the use of instructional media in the school. SMA Labschool Unesa 1 Surabaya is also a digital-based school by utilizing tablet media as a means of learning in class. The results of an interview with one of the Physics teachers at SMA Labschool Unesa 1 Surabaya stated that the teaching resources and teaching materials used in class activities were still limited to the teacher's handbook from the government and there were no teaching material innovations that were integrated with local wisdom. In this digital era, this research was conducted in September - October 2022. The research location is at SMA Labschool Unesa 1 Surabaya.

Data were collected by interview techniques, student response questionnaires, and direct observation of the condition of the learning media at the school. Interviews were conducted with physics subject teachers. The teacher was asked questions about the use of science learning media in the school. While in sampling In this case, the researcher used purposive sampling. This technique is used if in engineering determination of the sample based on consideration certain.

Students were given a response questionnaire with several questions regarding the use of physics learning media they had used. The next stage is to make observations by directly observing the state of the use of these learning media in schools, the function of observation is also to strengthen the analysis. The instrument was

made by taking into account 5 aspects consisting of (1) the type of learning media commonly used; (2) Frequency of digital media use; (3) The advantages of learning media that are commonly used; (4) Lack of commonly used learning media and (5) Teacher constraints in developing learning media. These five aspects are used because they are considered the main aspects that need to be observed in implementing the use of physics and environmental learning media at SMA Labschool Unesa 1 Surabaya. Results data interviews and student response questionnaires were analyzed descriptively.

RESULTS AND DISCUSSION

Based on the results of the research that has been done, it is obtained identification of problems resulting from field studies through pre-research activities. Researchers conducted interviews with Physics teachers at SMA Labschool Unesa 1 Surabaya, gave questionnaires to students in class XI IPA 3 regarding learning resources and implementation of learning in class, as well as gathering information through literature studies. This research is a qualitative descriptive study. In this study, an analysis of the needs of learning media was carried out. The analysis was carried out thoroughly regarding the use of instructional media in the school. SMA Labschool Unesa 1 Surabaya is also a digital based school by utilizing tablet media as a means of learning in class. The results of an interview with one of the Physics teachers at SMA Labschool Unesa 1 Surabaya stated that the teaching resources and teaching materials used in class activities were still limited to the teacher's handbook from the government and there were no teaching material innovations that were integrated with local wisdom. One of the physics teachers said that *"Physics learning media that I often use in class are ppt, government textbooks, kahoot, and PhET simulation. Physics learning in class also still does not link between the physics material being studied and the local culture in the local area."*

Computer applications that are part of information technology facilities can be used to develop student creativities in SMA Labschool Unesa 1 Surabaya. This application can trigger the creativity of students in developing presentation material where students can take advantage of multimedia technology that can be integrated into the application. In carrying out learning activities, SMA Labshool uses ICT every day. Teachers often provide material through UKBM assignments or through the whatsapp group, which are then sent via the whatsapp application itself or through google classroom. When collecting UKBM assignments, the teacher always instructs students to submit UKBM assignments in google classroom. In addition, the material provided by the teacher can be in the form of Internet links or youtube links. SMA Labshool Unesa uses the KIPIN application.

The results of an interview with a physics teacher at SMA Labschool Unesa 1 Surabaya stated that the teaching materials used in class were also not diverse, the main sources of learning books used were physics books from the government and supporting teaching materials in the form of power points and had not been linked to cultural potential. local local area. Responding to this, students stated that the media or learning resources had not been sufficiently helpful in the learning process. The results of student response questionnaires conducted at Labschool Unesa 1 Surabaya High School showed that students considered physics lessons to be quite difficult and not very interesting, this was because they considered physics lessons to have too many formulas and numbers, not very useful in everyday life. Today, physics lessons at school are also rarely connected with local culture.

The reality on the ground shows that the results of the data Preliminary scientific literacy taken through the handbook used by teachers at SMA Labschool Unesa 1 Surabaya was obtained results with very less category. So that during the learning process students do minimally meaningful experimental activities or nuanced activities scientific investigation so that students do not have the opportunity to construct their own knowledge. The effort given to this problem is to develop a special teaching material such as e-modules and train scientific literacy. Books that are already on the official website of the Ministry of Education and Culture, namely, do not yet contain physics subjects which should take full advantage of the maximum potential of digital books, such as a direct search feature that makes it easier for students to find related sub-materials and inclusion of animated, video and simulation content because the books are in the site is designed to be printed on paper as raw material. Along with the development of technology, printed modules began to be developed into digital modules in the form of softcopy that are easy to learn (Muzijah, 2020).

In this digital era, Information and communication technology is a tool in an effort to achieve a learning process that prioritizes 21st century skills that must be possessed by students. There are many technological devices or information technologybased applications that support student activities in the learning process to achieve 21st century skills such as creativity, innovation, communication, collaboration, information and media literacy skills. Learning media is needed in learning physics where the use learning aids or learning

media is an inseparable part of the learning process and is a form of integration of a method study used. The quality of learning physics can be determined by several factors, Availability of facilities, tools and materials laboratories and learning media good for carrying out a process learning.

Students consider that the available textbooks are difficult to understand, so students generally do not read textbooks before learning begins. Thick book dimensions and many subjects can make it difficult for students to bring learning resource books per day, even more so the available books all contain material for one school year. In ideal conditions, students should not be burdened with the weight of carrying these textbooks. This problem can be overcome by providing lockers at schools, printing books on lighter paper types, or using digital learning resources that can be copied and used independently (Febrianti, 2017).

The solution to solving the problem above is carried out with two alternatives for implementing the desired learning, namely: first, developing media that is theoretically appropriate, according to student characteristics, according to learning needs and in accordance with the cultural environment of students, so that in the learning process it can provide variations in the presentation material in the form of independent media. Second, bringing learning closer to the cultural environment of students, especially local culture which is the pride/excellence of the people in their area (Sholeh, 2019). Knowledge related to scientific concepts and regional languages is also contained in traditional games. The concepts contained in local culture and traditional games can help make it easier for teachers to deliver learning materials to students. Physics is one of the subjects which contains the basic concepts in traditional games. In these traditional games there are lessons that can be emulated, developed into learning physics at school (Hariastuti et al, 2020).

In line with this, according to Prastowo (2015) the function of materials teaching in this case is to be able to streamline time in teaching, the role of the teacher to be a facilitator and so that the learning process becomes interactive and interesting. The benefits students can also feel that when using this e-module students gain increased knowledge both in terms of physics and the technology used. E-modules equipped with various knowledge directly applications or physical phenomena in everyday life. Time efficiency in learning can also be realized because the e-module is in the form of a flexible application so that it allows students to study independently anywhere and is easy to carry. The research carried out is in line with the research of Wulansari, Kantun, & Suharso (2018) which states that e-modules are teaching materials that can help students learn subject matter independently using electronic media.

This could be one of the factors that causes the average value of physics to be lower than in other subjects, especially in science. For students, learning physics that is related to everyday life is a method that makes it easier for them to understand a concept or theory that has been explained. Many physics learning in Indonesian schools does not relate to local culture, even though Indonesia has a diversity of cultures that can be used as a source of learning. Learning with a scientific approach requires students to understand science from the surrounding environment and culture in the local area. Students argue that learning resources based on local wisdom interesting because it not only helps in understanding a theory but can preserve and pass on local culture that has started to fall behind. The use of textbooks in schools is not enough to provide an understanding of physics. Students state that teaching resources related to the phenomena of everyday life can help them to more easily understand the concept of the material being studied.

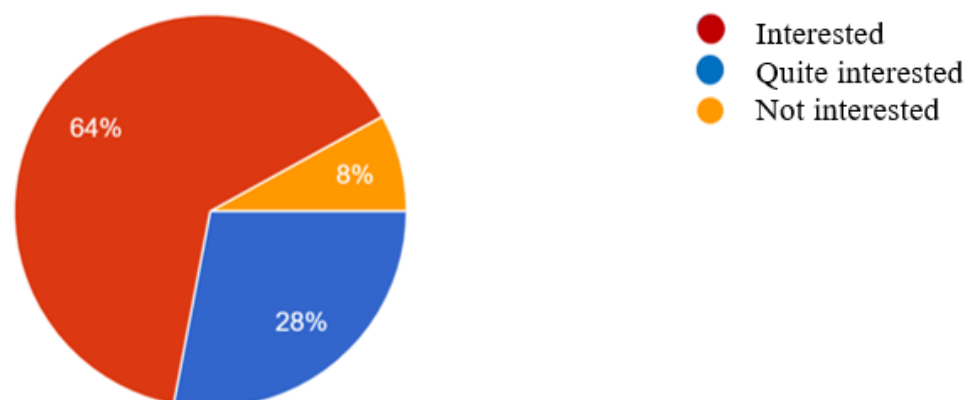


Figure 1. Student Response Diagram

The link between local wisdom and physics learning can be a new way to explain or present a theoretical explanation, which is packaged briefly and attractively in the form of a digital handout. Students think that learning physics by integrating real phenomena or events in life will be easier for them to understand. This is in line with Lukman's research (2019) which states that students are more interested in learning by using local wisdom-based animated video media in science lessons because it can make it easier for students to understand the material being studied. There were 8% who said they were not interested in learning based on local wisdom. Students stated that the integration of local cultural values with physics is a unification of science and culture which are considered different and difficult to learn.

Based on research conducted by Oktaviana (2017) suggests that the existence of a link between the material being studied and daily activities in the living environment causes students to gain direct learning experience. This is supported by Harefa's research (2017) that learning physics which is associated with real phenomena makes physics not only rote, complicated, pointless, and boring. However, physics becomes a meaningful, useful, and friendly lesson for students because what they learn really exists in their surroundings. Learning must be relevant with the opportunity given to students to construct knowledge in cognitive processes. In understand the various materials used various scientific approaches, so Information can come from anywhere, at any time only, and do not depend on educators.

Technology based learning in the 2013 curriculum is expected to be able to make the learning process more enjoyable so that it fosters students' interest in learning, helps students' understanding, motivates students, and makes the learning process student-centered (Zuhri, Muhammad Saifuddin., & Jatmiko, 2013). Optimizing the use of media with interesting learning approaches and learning resources is one of the learning objectives so that the teaching and learning process is achieved properly. Not only that, educators must also know the characteristics of students so that learning objectives can be carried out optimally and students get optimal learning outcomes (Sriwahyuni, 2019). Handout integrated with local wisdom provide an opportunity for students who study in cities, especially at SMA Labschool Unesa 1 to get to know local culture in East Java. In addition, handouts that are presented in digital form can support digital-based school implemented at SMA Labschool Unesa 1. Learning activities with digital media can facilitate and support students learning outside the classroom.

Learning with a scientific approach requires students to understand science from the surrounding environment and culture in the local area. The local potential in question is events, events, problems or phenomena found in the environment where students come from. Local knowledge studies related to the concept of physics in traditional Kekehan games have the potential to increase knowledge and preserve local wisdom values in Indonesia. When viewed from an educational perspective, identify local knowledge related to physics concepts in accordance with the 2013 curriculum for physics learning materials in schools (Rumiati, 2021). In essence, the subject matter contains messages to be conveyed to students to achieve learning objectives (Martawijaya, 2014). So that it can help teachers associate learning material with factual events in learning.

CONCLUSION

Physics learning media used in schools are not very diverse. Teachers find it difficult to develop learning media. The slow development process is also caused by the teacher not having much time to develop media. The results of the needs analysis are done, found that interactive multimedia development based on the local cultural context science subjects on the process learning is very important and necessary for use in the process learning. The developed media is context based interactive multimedia local culture that can improve students' understanding of the material which has an abstract concept and introduce students to original culture. Local wisdom oriented learning can improve student learning outcomes because it gives more in depth contextual impressions so students can easily understand the material being studied. Learning with a scientific approach requires students to understand science from the surrounding environment and culture in the local area. The local potential in question is events, events, problems or phenomena found in the surrounding area.

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