

Analysis of The Need for Digital Teaching Materials Vibration and Wave Materials in Class XI of Integrated Islamic High School

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Abstract

The curriculum with this scientific approach focuses more on the use of teaching materials with the use of Information and Communication Technology (ICT) in all fields of study taught by teachers. In fact, physics learning is more often done by reading books and memorizing equations and students interact less with the surrounding environment to improve their ability to solve physics problems. An alternative solution to this problem is the development of digital teaching materials in the form of E-modules for physics subjects. Before developing these teaching materials, it is necessary to hold an introduction to the main research on the development of digital teaching materials. The purpose of this study is to analyze the need to design a draft of physics teaching materials in the form of Quran-based E-modules. The benefit in this study is to find out the analysis of the need for digital teaching materials for physics subjects. The research method used is descriptive qualitative with the object of research for class XI I students of Integrated Islamic High School totaling 52 students. Data collection techniques with interviews, observations, and questionnaires. A needs analysis is carried out to identify the scope of teachers, facilities and infrastructure and identify the characteristics of students. The results of this study were that 93.3% of students agreed with the development of digital teaching materials such as E-modules of vibration and wave materials and 90% of students agreed with the development of digital teaching materials such as E-modules in Physics It provides a real picture of the need to develop digital physics learning resources for vibration and wave-based materials of the Quran in class XI students at the integrated Islamic High School Palembang.

INTRODUCTION

The world of education is currently starting to integrate technology in various aspects including learning. Education policy is directed to utilize information and communication technology so as to be able to prepare human resources who are able to face global challenges (Syaiful, 2017). Utilizing the development of information and communication technology, education can reach all levels of society living in various places, in cities, villages, even in remote or inland areas. According to Ketang Wiyono (2014) The development of ICT in the field of education is characterized by the use of computers to create practical, interesting and interactive learning. Information and communication technology is able to generate motivation for learning.

There are many things that are able to influence the learning process. One of them is motivation. The presence of good motivation in learning will show good results. With diligent effort and based on motivation, someone who learns will give birth to good achievements. The intensity of a person's motivation will determine the level of achievement of his learning achievement (Sardiman, 2006). Therefore, to realize a good quality of human resources, at least students must have good learning achievements. Good learning achievements can be realized, one of which is by increasing learning motivation through the use of information and communication technology in the learning process.

The curriculum with this scientific approach focuses more on the use of learning media with the use of Information and Communication Technology (ICT) in all fields of study taught by teachers. Likewise, physics learning in schools prioritizes the process of science and technology that is developing today. Physics is one part of Natural Science (IPA), which is a science that studies natural symptoms, events or phenomena and reveals all the secrets and laws of the universe. (Asyisyifa, 2016) . Fisika is "the branch of basic science that studies the behavior and structure of matter". The nature of physics is the same as the nature of science as a product (*a body of knowledge*), attitude (*a way of thinking*) and process (*a way of investigating*) (Ataji, 2020).

In fact, physics learning is more often done by reading books and memorizing equations and students interact less with the surrounding environment to improve their ability to solve physics problems. So to support the improvement of physics learning, there needs to be teacher consideration in choosing a learning approach and also choosing learning resources to be used, for example learning tools, learning media, modules, books and others (Budaeng, 2017). Learning is expected to be able to provide space for students who want to be creative and develop their talents independently. According to Ismet (2013) a productive strategy in teaching is to provide various representations of a physical process, in the form of words, drawings or sketches, diagrams, graphs, and mathematical equations. The explanation of a science concept will be clearer when the concepts are presented using various representations (multirepresentation) at once.

Electronic modules are teaching materials that are arranged systematically and interestingly including material content that can be accessed through electronic media to help students in the learning process e-modules have a *self-instruction* character that allows students to learn independently. This e-module will later be equipped with virtual simulation, virtual simulation is a simulation medium using a computer that can present natural phenomena that play a very important role in science learning (Daulay, 2016). Virtual simulation media can be a substitute for practicums that use props, because with simulation microscopic phenomena can be described with a dynamic approach. The use of virtual simulations in learning can potentially provide motivation in significantly improving learning and more effective learning experiences.

The purpose of learning physics is to master concepts and principles and have the skills to develop knowledge and a confident attitude as a provision to continue education at a higher level and develop science and technology (Lestari, 2020). In addition, physics is physical knowledge, so to

study physics and form knowledge about physics, direct contact with what you want to know is needed, because physics is a science that requires more understanding than memorization (Firdaus, 2019). The purpose of learning physics is to master concepts and principles and have the skills to develop knowledge and a confident attitude as a provision to continue education at a higher level and develop science and technology (Hartono, 2015).

Physics as a lesson related to daily life will certainly be easier and more fun if in the learning process it uses interesting learning media and is related to events that occur in the student's living environment. For example, by associating physics with natural phenomena that occur or associating the process of physical knowledge with the Qur'an. In addition, physics is physical knowledge, so to study physics and form knowledge about physics, direct contact with what you want to know is needed, because physics is a science that requires more understanding than memorization (Wiyono, 20 21). The purpose of learning physics is to master concepts and principles and have the skills to develop knowledge and a confident attitude as a provision to continue education at a higher level and develop science and technology (Fajar, 2022).

Based on the results of the needs analysis questionnaire given to 20 students at SMA IT Raudhatul Ulum, 60% of them experienced difficulties in learning Physics in the classroom. Then data was obtained that the teaching materials used in the Physics learning process in the form of package books and LKS as well as additions from the internet commonly used by educators could not be used optimally. Then data was also obtained that students needed teaching materials that were integrated with verses of the Quran in physics learning in Class XI. Based on the background, a problem can be formulated, namely How is the analysis of the need for digital teaching materials for vibration and wave materials in Class XI of Integrated Islamic High School?

METHOD

This research method uses descriptive qualitative research (Arikunto, 2014). This research was conducted at the Palembang Integrated Islamic High School. The research subjects at the anasisis stage need with 1 Gutu Physics Subject class XI, as well as analysis of the characteristics of students in 52 class XI students at the Integrated Islamic High School who are involved in learning the subject of Physics of vibration and wave matter. Data collection techniques used in the analysis of the need for digital teaching materials are interviews and questionnaires in the form of *google forms*.

RESULTS AND DISCUSSION

Based on the needs analysis data in this step, the activities carried out by the researchers are conducting interviews and distributing questionnaires through *google forms* to teachers and students of class XI at the Palembang Integrated Islamic High School. The purpose of the interview with the physics teacher is to find out how the learning process is physics in the classroom and what learning resources have been used by the teacher. The following is data from an interview with a class XI physics subject teacher at the Palembang Integrated Islamic High School.

The results of the needs analysis in this study identified the scope of the study Most students find it difficult to understand physics lessons, especially on Quran-based wave vibration materials. This is because vibration and wave material has not been linked to the Quran-based, through printed learning resources and and many materials have not been associated with the Quran because it requires practical access. This phenomenon can be seen from the value of student scores, namely 96.66% still below the minimum completion criteria.

In addition, the researcher obtained some information that supports the selection of products and materials to be developed in the *E-module*. Some of the findings from the results of the scope identification analysis are as follows: 1) Teachers of Class XI physics subjects stated that the achievement of student competency results in physics learning is still relatively low. This is because learning physics of vibration and wave materials is still considered difficult 2) Teachers of physics subjects rarely use digital books in delivering material so that students have difficulty in understanding a lot of material 3) Teachers of physics subjects rarely use digital teaching materials. Teaching materials that are often used are printed books, modules, 4) Teachers have never used E-modules, because only printed teaching materials are available.

Based on the analysis above, it allows learners to understand less vibration and wave material due to the lack of teaching material innovation in physics learning. Teachers need the right solution in the form of practical digital learning materials and videos. The learning materials needed must be in accordance with the needs and characteristics of students so that they can help students in improving learning outcomes. After identifying the physics subject teachers, then the researchers identified the scope of facilities and infrastructure at the Palembang Integrated Islamic High School. The results of the analysis of facilities and infrastructure can be seen in table 1.

Table 1 Analysis of Facilities and Infrastructure of Palembang Integrated Islamic High School

Facilities and Infrastructure	Ada/Tidak Ada	Information
Computer Laboratory	Ada	30 Computers
Internet Connection (<i>wifi</i>)	Ada	Connected
<i>Smartphone</i>	Ada	Every learner
<i>LCD</i>	Ada	Can be used in the learning process

Furthermore, from the analysis of the scope of facilities and infrastructure that has been carried out, researchers do the next rare thing, namely identifying the characteristics of students. Based on the identification of student characteristics, it is carried out using a *googleform* for class XI students of the Palembang Integrated Islamic High School. The results of the identification analysis of students can be seen in table 2 below:

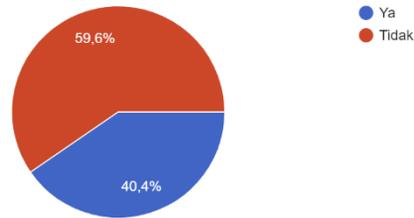
Table 2 Identification of Learner Characteristics

Percentage	Data Results
53,8%	Do not understand the physics of Vibration and Waves based on the Quran.
93,3%	Students think that they need interactive jar material for vibration and waves.
61,5 %	Learners need to learn Physics using the FlipHTML5 E-module
69,2%	Students love learning with audio visuals by displaying videos
90,9%	Students want learning with teaching materials equipped with barcodes
93,6%	Students want learning with teaching materials equipped with <i>google form</i>
89%	Students want learning with teaching materials equipped with links using the internet
98%	Students want learning with teaching materials that can be used with various Gadgets
87%	Learners want learning by using the FlipHTML5 app independently

95% Students want learning with teaching materials to be accessed anywhere and anytime

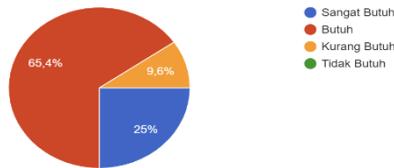
2. Apakah kamu tahu Materi Getaran dan gelombang yang berbasis Al-Quran?

52 jawaban



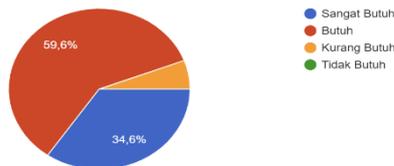
4. Pembelajaran Fisika Getaran dan Gelombang dengan E-Modul dilengkapi dengan Barcode

52 jawaban



5. Pembelajaran Fisika Getaran dan Gelombang dengan E-Modul dilengkapi dengan Evaluasi melalui Google Form

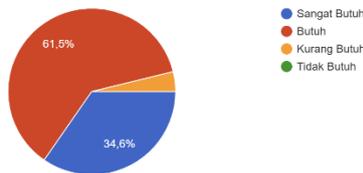
52 jawaban



2. Pembelajaran Fisika menggunakan E-Modul FlipHTML5

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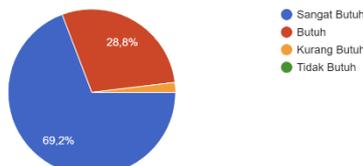
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3. Pembelajaran Fisika Getaran dan Gelombang dengan E-Modul dilengkapi dengan Video

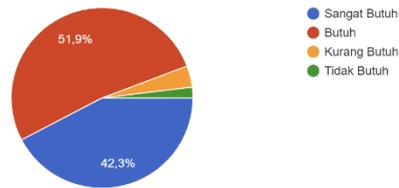
[Salin](#)

52 jawaban



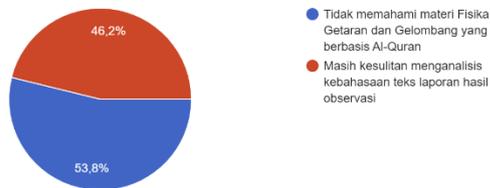
1. Materi dilaksanakan dengan fisika Getaran dan gelombang menggunakan Modul yang Interaktif

52 jawaban



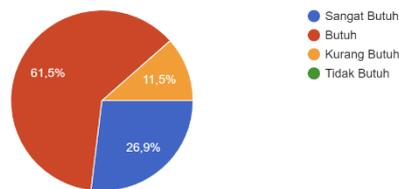
3. Hambatan apa yang kamu alami di saat mengaitkan materi Fisika Getaran dan Gelombang yang berbasis Al-Quran?

52 jawaban



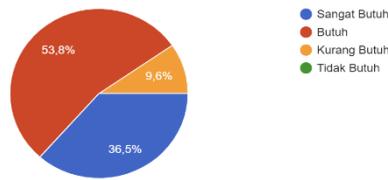
10. Pada pembelajaran tatap muka peserta didik mempelajari E-Modul materi Fisika Getaran dan Gelombang dengan menggunakan aplikasi FlipHTML5 secara mandiri

52 jawaban



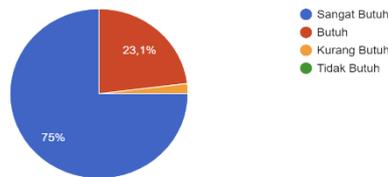
6. Pembelajaran Fisika Getaran dan Gelombang dengan E-Modul disediakan dalam bentuk Link menggunakan Internet

52 jawaban



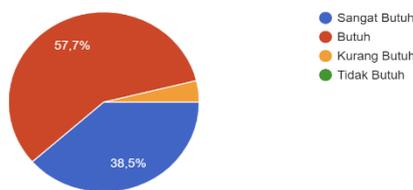
7. Pembelajaran Fisika Getaran dan Gelombang dengan E-Modul dapat gunakan dengan berbagai Gadget (Laptop, HP, Tablet)

52 jawaban



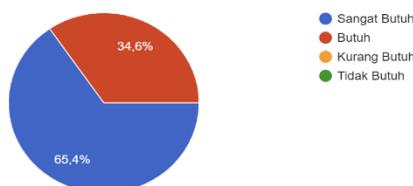
8. Pembelajaran Fisika Getaran dan Gelombang dengan E-Modul dapat gunakan dengan dimana saja dan kapan saja

52 jawaban



9. Guru memberikan pengantar dan arahan sebelum pembelajaran dimulai pada pembelajaran tatap muka

52 jawaban



Identifying the analysis of needs and characteristics described above there are 10 points shown that 80% of students are used to using laptops, this is because the facilities in the school support the learning process. The learning process at Palembang Integrated Islamic High School is quite good, only the lack of learning with digital learning resources makes students less interested and feel difficulty in learning, this aspect is also continuous with the second point which proves that 53.3% of students think the learning resources used so far are not interesting and 73.3% of students have difficulty in learning the material. Getaran and wave. So that it can be concluded from the needs analysis carried out that there is a need for new innovations in the form of more interesting and innovative digital materials to support the learning process at the Palembang Integrated Islamic High School.

CONCLUSION

It can be concluded that there is a need for new innovations in the form of more interesting and up-to-date digital teaching materials so that students can access teaching materials anywhere and anytime that are more practical and efficient. From the analysis data on the need for the development of digital teaching materials in the form of E-modules, it is known that 80% of respondents think there is a need for smartphone-based or computer-based digital learning materials that support technological developments so that they can adjust the learning styles of students independently which aims to help learn vibration and wave material and guide students in learning independently. Based on this data, as many as 80% of students stated that they needed a solution in the form of digital teaching materials.

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