Analysis of physics e-books assisted by application of learning house using quantum learning models to improve the 21st century skills of high school student

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Abstract: At this time, known as the century of openness and globalization, human life has changed and is different from previous lives, this century is known as the 21st century. 21st Century is also known as the era of knowledge, which is all alternative efforts to meet the needs of life in a variety of more knowledge-based contexts. The 21st century education paradigm has experienced a shift marked by differences in learning orientations. The learning of the previous century emphasized literacy in reading, writing, and mathematics, in which in the 21st century they were used as the basis for developing new literacy, namely human, data and technological literacy which is very important to face the current and future globalization era. The problem found in the field is the low skill of students there are three. First, learning physics in schools is very theoretical and mechanistic. The learning process begins with an explanation of concepts accompanied by examples, followed by work on exercises in Physics questions. Secondly, schools do not arrange the learning environment. Third, students have difficulty learning physics. This is supported by the results of interviews with students that one of the subjects considered difficult is physics. This is caused by their ignorance of the benefits they get from studying physics. Based on the preliminary analysis conducted, the first it was found that Value Of Physics Learning is for the preliminary and closing components is 78 for preliminary activities and 78 for closing activities. The learning process delivered by the teacher should not only provide knowledge to students, but students who must build skills in their own minds. The results of the data analysis show that: the implementation of learning components and strategies using the quantum learning model in physics learning are grouped into sufficient categories, the use of e-books is that physics teachers have never used them, teacher only uses printed books or modules in learning. Therefore, the results of this study can be used as a basis for designing and developing the required physics e-book to increase student knowledge.

1. Introduction
The 21st century is marked as the century of openness or the century of globalization, meaning that human life has undergone fundamental changes that are different from the order of life in the previous century[2].The 21st century is also known as the age of knowledge, namely all alternative efforts to meet the needs of life in various contexts that are more knowledge-based. The 21st century education paradigm has undergone a shift marked by differences in learning orientation[9]. Previous century learning emphasized literacy in reading, writing, and mathematics, in which in the 21st century the three of them were used as basic capital to develop new literacy, namely human, data and technology literacy which is very important to face the current and future era of globalization. Education in schools needs to produce graduates not only possesses relevant knowledge but also interpersonal relations and communication skills[1].
Physical Science is formed from the process of studying natural phenomena carried out by scientific methods. A series of scientific processes is applied in physics learning to facilitate students in building knowledge, attitudes and skills [10]. Choosing a learning approach that is in accordance with the scientific method in learning physics, besides being able to develop students' science process skills, it can also foster scientific attitudes [2]. In the 2013 curriculum, physics learning is carried out using a process skills approach. Physics learning should no longer only lead to the provision of concepts, but there must also be skills, physics learning must lead to the physics process.

Improving the quality of education can be carried out in the aspects of knowledge, skills, attitudes, and values in various ways. The development of this aspect is carried out to improve and develop life skills through a set of competencies, so that students can survive, adapt, and succeed in the future. The implementation of education in Indonesia functions to develop abilities and shape character in order to educate the nation's life [4].

Interactive E-Book is a learning media used to help students understand abstract learning to be clear about the material. In this media there are text, images, graphics, videos which are packaged together in the form of an electronic book so that it can attract the attention of students to learn. The function of e-books in general is as a medium for reading information digitally through special devices. Generally, e-book users are those who are technology literate and are used to buying e-books for learning media.

There are three problems found in the field are the low skills of students. First, learning physics in schools is very theoretical and mechanistic [10]. The learning process begins with an explanation of the concept accompanied by examples, followed by doing exercises in physics. Second, schools do not do enough in structuring the learning environment. Third, students have difficulty learning physics. This is supported by the results of interviews with students that one of the subjects considered difficult is physics. This is due to their ignorance of the benefits they get from studying physics. The learning process conveyed by the teacher should not only provide knowledge to students, but students must build skills in their own minds. Based on such problems, an alternative solution to improve students' 21st century skills is the use of an interactive physics E-book with a quantum learning model [18].

There are three problems found in the field are the low skills of students [10, 11]. First, learning physics in schools is very theoretical and mechanistic. The learning process begins with an explanation of the concept accompanied by examples, followed by doing exercises in physics. Second, during the pandemic schools did not provide online learning resources to students, only assignments. Third, during this pandemic students experienced difficulties in studying physics because online learning was not going well because of the lack of resources to study learning material. This is supported by the results of interviews with students that one of the subjects considered difficult is physics. This is due to their ignorance of the benefits they get from studying physics. The learning process conveyed by the teacher should not only provide knowledge to students, but students must build skills in their own minds. Based on such problems, an alternative solution to improve students' 21st century skills is the use of an interactive physics E-book with a quantum learning model.

2. Research Method

Research Method is procedures for collecting and analyzing data. The Research type used in this research is descriptive which was conducted in August 2020. The preliminary analysis used is a needs analysis and analysis of student characteristics. Valid information requires appropriate research instruments. The research instrument used was an interview guideline sheet. The research sample was SMA N 7 Padang and SMA N 8 Padang.

Descriptive research to describe or explain such as research variables [8]. The data obtained are qualitative data. The results of the analysis obtained are expressed in percentage terms and then interpreted in the form of scientific narrative.
3. Results and Discussion

Data from observations of the implementation of physics learning were obtained from two high schools in the city of Padang. The observation indicators of physics learning consist of four which include: Preliminary Activities (A), Use of learning house applications (B), Quantum Learning Model (C), closing activities (D). The data were obtained from five teachers from two SMA Negeri 7 and SMA Negeri 8 Kota Padang. The results of the analysis of the implementation of physics learning can be seen in Figure 1.

![Figure 1. Value of physics learning](image1)

From Figure 1, it can be seen that the highest score for the preliminary and closing components is 78 for preliminary activities and 78 for closing activities. Whereas in the use of the learning house application, teachers at school are only aware of the application but have not used it in the current pandemic condition[19]. In the use of quantum learning models have been used by teachers but only a few times. Quality education can be identified by fulfilling the needs that support the learning process. The results of the needs analysis can be elaborated through performance analysis, analysis of student learning difficulties[15].

Performance Analysis is a specialist discipline involving systematic observations to enhance performance and improve decision making, primarily delivered through the provision of data analysis. This analysis can be seen from the identification of teachers and the school completeness facilities available. The results of the performance analysis conducted at SMA N 7 and SMA N 8 can be explained by Figure 2.

![Figure 2. Performance analysis](image2)
Based on Figure 2, can explain that the teacher's ability to design the learning process is good, but still needs to be improved. It can be seen from the expert's indication that only 68%. The learning process will run well if the learning devices are made in accordance with the content standards and basic competencies that have been formulated in the 2013 curriculum[15].

Based on interviews, the facilities at school are actually good and quite complete, but school still need improve to use of facilities and infrastructure that have been provided at school. In this pandemic, all subject and learning process in online class, Physics laboratories and practice tools are rarely used in the learning process. The teacher does not conduct experiments on each learning topic to do Basic Competency 4 contained in the learning objectives[14]. This is evidenced by the percentage of the use of facilities and infrastructure in the learning process only 57%, under current conditions, the laboratory is not used optimally because all learning is carried out online. For application of learning house, teacher still not really know about that application[16].

Competence is the result of learning achieved by students at the end of the learning process. Every students has own competence, and is the main part that must be formulated in learning, which has an important role in determining the direction of learning[10]. Competencies that must be possessed by students are competency attitudes, knowledge and skills competencies. Every student should have good competence to make learning goals. One example is good social relations are external forces for students in achieving competency in good social attitudes[11].

Physics learning is considered difficult by students. To minimize student difficulties, it takes a learning model, approaches and right teaching materials in learning Physics[12]. Quantum learning model one of model learning that’s good to use when teaching physics. Good teaching materials are teaching materials that are in accordance with the 2013 curriculum, one example of teaching material is e-book for student. The right learning model and approach is also an important part for overcoming learning difficulties[13].

The results of the analysis of characteristics showed a percentage that was classified as low and not really good. The solution to these problems is teaching materials that can help students to understand the concepts of physics more easily, increase student interest and motivate and improve competency in attitude, knowledge and skills. Therefore a preliminary study is the basis by the authors to develop e-book in learning high school physics.

4. Conclusion
Based on the preliminary analysis conducted, there are two results of this research, the first it was found that Value Of Physics Learning is for the preliminary and closing components is 78 for preliminary activities and 78 for closing activities. This value can be classified into very practice category. The second, in the use of the learning house application, teachers at school are only aware of the application but have not used it in the current pandemic condition. while at this time the learning house application is very helpful in the online learning process. In the use of quantum learning models have been used by teachers but only a few times. The implication of the results of this study can be obtained from research results related to the analysis of Physical Analysis of E-Books Assisted by the Application of Learning Houses Using Quantum Learning Models to Improve the Skills of 21st Century High School Students. Both physics e-books and the 21st century have become relevant issues that needs to be investigated further. For this reason, research is to analyze physics e-books with the help of learning house applications to improve the quality of physics learning in schools and improve student skills in the 21st century.

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