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The Need Analysis for E-Learning Based on Massive Open Online Course (MOOC) for High School Students

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Abstract: The rapid development of the era demands that the world of education also be involved. Because along with the development of the times, education must experience innovation and adapt to advances in technology and information to exist and maintain its quality. MOOC is a system that integrates education and technology. Through this system, learning is presented that is interesting, effective, and easily accessible to anyone. This survey research was conducted as a first step in developing MOOC-based e-learning for high school students. The benefit of this research is that we will get what students currently need in learning physics online based on MOOC. This requirement analysis is seen based on two indicators: analysis of learning problems and analysis of students. Based on the results of this study, it was found that there is a need for MOOC-based e-learning for high school students with a high category level. Thus, the steps that will be made after this are developing learning tools to meet these needs.

Keywords: Need Analysis; E-learning; Massive Open Online Course (MOOC)

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Introduction

One of the significant advances and changes of the 21st century is the very rapid development of internet technology. One of the impacts of change that is felt in this regard is that we can get access to education and jobs through the internet today. Through the internet, we can also communicate and socialize without geographical distance, shop, or entertain ourselves (Bhardwaj & Goundar, 2018). Even the world of education is always required to adjust to always move along with global technological advances (Suyetno, 2019). This is also the origin of the birth of e-learning in the present era. The goal is that education is increasingly existing and can adapt to the conditions of the times so that the packaging of education is more attractive and transforms into better quality and quality. According to Munir in Hanum (2013), we can define e-learning as the application of information technology in the world of education in the form of a virtual world, which is intended as a form of transformation of the world of education in schools and colleges into a digital world bridged by internet technology. The need for internet technology and access to the digital world increases. Moreover, the world of education, which was originally conventional, began to try to change direction and transform towards digital as a form of adapting to the demands and conditions of this century.

E-learning will present a new atmosphere in various learning developments. The good use of e-learning can also increase student's motivation to the maximum (Ilyas & Liu, 2020). With its simpler and more efficient nature, this is a great opportunity for education to improve its quality and quality. Today the world of internet technology is very accessible. Moreover, a significant difference between e-learning compared to traditional learning is the position of the

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roles of teachers and students. In traditional classrooms, the teacher's position is placed as a knowing figure of knowledge sharing. So that indirectly, the sustainability of the class is very dependent on the presence of teachers in the classroom. Meanwhile, e-learning is more student-centered. In this learning, students are required to be more independent and responsible for their learning. It is expected to be more active in exploring and mastering the materials and tasks given more independently.

In the world of education, many learning projects have been started and directed to the digital world. One example is MOOC. MOOC, or what is commonly referred to as the Massive Open Online Course, is a learning system carried out online on a large scale with many participants with different and far-reaching scopes and distances. This MOOC can be accessed by using via the web or applications digitally and on the internet network. This makes this model system very efficient and easily accessible to anyone globally. Two characteristics that stand out from MOOC are the large number of participants and the large scale as well as the infrastructure in the distance learning process (Johan, 2015).

New technologies, such as MOOCs, provide innovative methods to address new challenges in learning. Even in recent years, MOOC has spread widely and become one of the future trends to help people from all over the place to study online and in various fields of science. (Akashdeep Bhardwaj & Sam Goundar, 2018). The development of technology and information, especially in Indonesia, is very dynamic. This development of the course impacts all fields, such as economy, health, social, and of course in the field of education (Cholik, 2017). So it is natural that currently, the educational model that adapts the MOOC system has been widely developed by various universities and corporate agencies worldwide. Among them are Coursera, IDX, Udacity, Moodle, and so on. Apart from being a learning medium, MOOC can also be a business market with high popularity (Kruchinin, 2019). These various providers are also very easy to access via the web and applications, so they can be accessed anywhere and anytime in the learning process. The features presented are also very promising and help in the effectiveness of learning, such as video features and materials, final assignments, as well as discussion and evaluation forums. So that this will not eliminate the essence of learning, but on the contrary, it will further enrich and strengthen the learning process itself.

Learning physics is a learning that is quite difficult and has a complex process, so that many students generally do not like to learn basic principles and concepts about physics. In physics learning, learning methods that are too teacher-centered are no longer sufficient to understand the basic principles of physics for students and cannot improve their learning quality. Therefore, to improve this quality, learning methods must be able to make students play an active role and interact with their surroundings (Gok, 2018). This can be done with discussions, experiments, and exploratory observations outside the classroom so that the learning experienced by students feels more meaningful and not just theoretical.

Based on the background description above, the researcher is interested in analyzing the needs of MOOC-based e-learning for students in schools with the title "The Need Analysis For E-Learning Based on Massive Open Online Course (MOOC) for High School Students". With this designed analysis, it is hoped that it can map the needs of students in the process of teaching and learning activities online.

Method

The analysis of this research was conducted at SMAN 1 Kuantan Mudik, Kuantan Singingi Regency, Riau, with a survey response totaling 46 students. The study was conducted in November 2020. The type of research conducted was survey research. The research process flow can be seen in Figure 1 below:

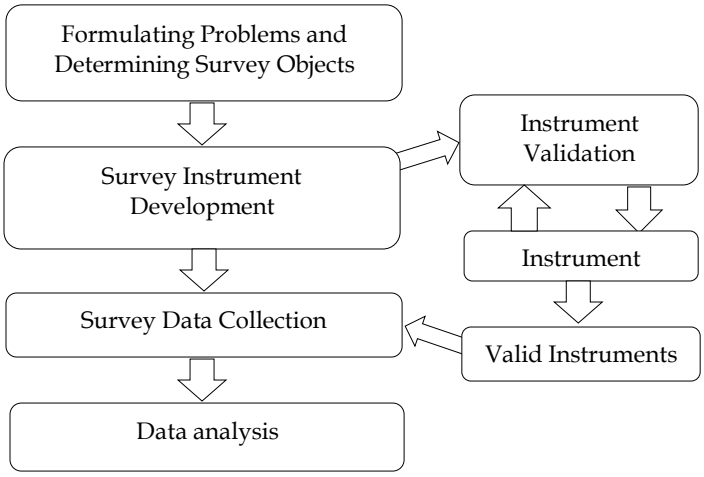

Figure 1. Flowchart of The Need Analysis For E-Learning Based on Massive Open Online Course (MOOC) for High School Students.

The research instrument used a questionnaire which was developed based on the indicators of needs analysis. This research instrument has been declared valid and reliable. The questionnaire consists of question items from 2 indicators which can be seen in Table 1 below:

Table 1. Instrument Question Indicator.

Analysis Indicators	Number of Question Items
Analysis of Learning Problems	4
Student Analysis	6

The question items consist of 4 answer choices: strongly agree with 4, agree with 3, disagree with 2, and strongly disagree with value 1. Before the questionnaire is distributed, the questionnaire will be validated by two expert validators to assess the appropriateness of the instrument. To determine the level of needs in this analysis can be seen in Table 2:

Table 2. Purposes Analysis Category.

No.	Average Score	Category	Decision
1.	>3.25 - 4	Very High	Need
2.	>2.5 - ≤ 3.25	High	Need
3.	>1.75 - ≤ 2.5	Low	No Need
4.	1- ≤ 1.75	Very Low	No Need

Result and Discussion

Kuo (2016) states that need analysis is a technique of collecting data and assessing relevant information related to a research design to map the problems to be studied. This study used needs analysis to assess how necessary MOOC-based e-learning learning is for high school students. This research is also expected to be the first step in the solution of the existence of learning innovations that integrate technology in education. So that e-learning learning which was previously unattractive, is now much more effective using MOOC-based media.

With this MOOC-based e-learning learning, teachers will be easier and helped by the role of technology in it. Likewise, students will be further interested in the packaging of various interesting features and content on the MOOC media, such as link access for virtual experiments, quiz features, and group chat features. Thus, the learning that takes place is highly integrated with technology. The share of information and communication technology is needed to improve the quality of education (Kuimova a, 2016). Developed countries make information and communication technology a driving force to advance the world of education. While third world countries still use manual methods or methods in making changes in the development of their education so that the accessibility of information and communication is slow to be integrated. This is the cause of the world of education experiencing degraded or underdeveloped decadence in the field of education (Kuimova, 2016).

In the analysis of the needs used as research subjects according to Dudley-Evans and St. John in Rahman (2015) states that there are three concepts of needs analysis: (1) to recognize the condition of students, (2) to know how learning can be maximized in certain conditions and groups, and (3) to know the target situation and environment so that data can be interpreted appropriately. Because in the context, it is following the opinion of Alqunayeer & Zamir (2016) that learning needs are defined as what students need to do and be able to master the necessary knowledge and skills. Therefore, everything related to students, such as their interests, talents, and backgrounds, must be considered in identifying or analyzing these needs.

In this study, two indicators will be measured and analyzed as a reference for the analysis of the development needs of MOOC-based e-learning for high school students. In the problem analysis indicator, there are 4 question items, including what learning methods have been used so far. Have these methods have been effective? And what methods were desired by students? In question item 1 about what learning methods have been used in e-learning learning, the responses provided answers as shown in Figure 2. To find out how effective these frequently used methods are and the learning methods students want in online learning, the first question is asked. 2 and 3, whose answers can be seen in Figure 2 below:

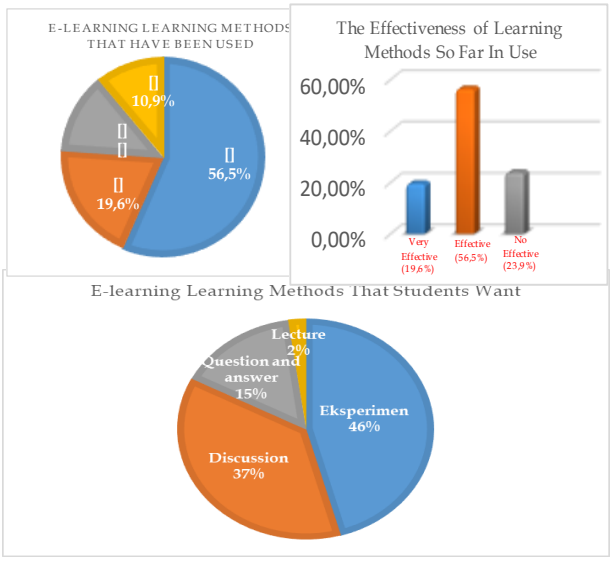

Figure 2. Questionnaire Results About the learning method, its effectiveness, and the method students want.

In the results of the answer to the question-and-answer method used, the students answered that the question-and-answer method was widely used. At the same time, the methods that are rarely used are the experimental and lecture methods. In question 2 about its effectiveness, the method used so far is still considered effective according to the dominant answer given, even though the method used still has many

shortcomings and weaknesses so that it has become a problem for e-learning so far. Because the learning method used still has shortcomings and weaknesses, according to the students' answers to question 3, many want an experimental method to learn physics. However, because learning takes place online, experiments must be packaged in virtual labs or experiments in cyberspace. To be able to do this, learning must be equipped with attractive and appropriate media. But the fact is that online learning problems that have had the most impact on teaching and learning activities so far are the less attractive and effective media used so that students are less interested in being actively involved in it. This is derived from the answer to question 4 in the survey. The results can be seen in Figure 3.

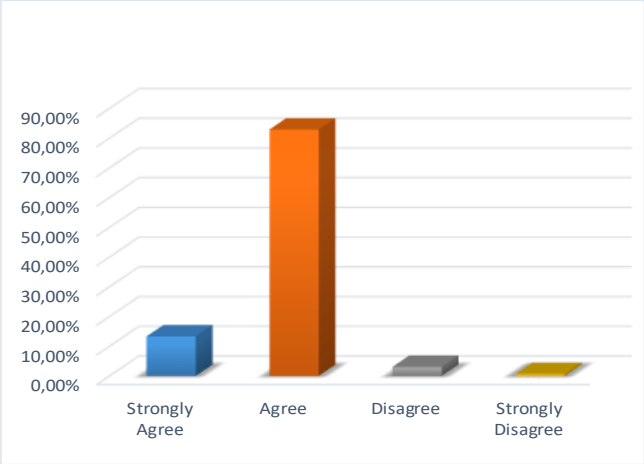

Figure 3. Questionnaire Results Concerning the Less Attractive Problem of Media in E-Learning.

In the analysis of the learning problems of the four question items posed in the questionnaire, it was concluded that the main problems for students in e-learning learning so far were less effective and, interestingly, the media used. For example, the media used is not interactive, does not have many features of learning content, and cannot facilitate students to do experiments. With mediocre media or without media, the learning methods are used ineffective, especially to allow experimentation. This also makes students feel less interested in being actively involved in the learning that is taking place and taught by the teacher. So that this problem must get the right solution, namely the use of media that is communicative, effective, and attractive to students. In this case, MOOCs can be an alternative option at the forefront of this problem. This is confirmed by the opinion of Woon (2019), which states that MOOC is a web-based online learning medium that attracts various people globally with the freedom of an open and easily accessible learning environment. So this MOOC creates a new approach in the world of learning and teaching. Kurniasari et al. (2018) also wrote that MOOCs had become a solution to educational inequality. Anyone can join it to access scientific studies and information that are more up-to-date and support skills. Thus MOOC can become a medium with innovative methods in facing new challenges in teaching and learning activities (Bhardwaj & Goundar, 2018).

In the analysis of students, there were 6 question items. Question 1 items get the result that all students (100%) who filled out an active questionnaire and often used a smartphone or laptop connected to the internet every day. The duration of use by them every day also varies, the survey results for the percentage can be seen in Figure 4 below:

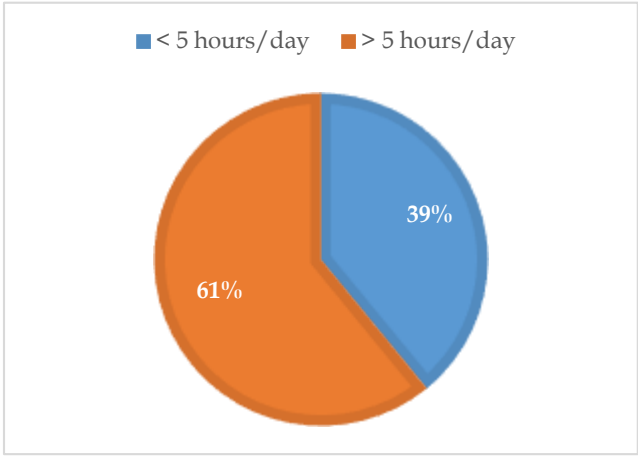

Figure 4. Questionnaire Results Percentage of the Duration of Using a laptop or smartphone with a Student's Internet Connection per Day.

In the picture above, we can see that the high percentage of students using a Smartphone or laptop with an internet connection is more than 5 hours/day. This is also strengthened and by data from the Ministry of Communication and Information, which notes that most Smartphone users come from the millennial generation. This proves that high school students are now very dependent and often use smartphones or laptops at any time in their daily lives. This phenomenon certainly has advantages and disadvantages. The disadvantage is that the use of smartphones has become a trend or lifestyle today, and with various applications, they can provide various social media, so it is often misused by students (Manumpil et al., 2015). If it is not controlled properly, it will be very dangerous if it is used for something that is not good, and with the length of use, it will reduce social interactions and disturb health. However, it will be different if the use of a smartphone or laptop with an internet connection is used for positive activities such as studying. This, of course, will be a means of

support to improve the quality of the learning and education process.

This student analysis also surveys the needs needed by students in online learning so that teaching and learning activities continue to be communicative, effective, and interesting even though they take place online. To find out, several questions were asked about the needs of students. These questions include the transfer of learning using a laptop or smartphone with an internet connection that makes learning more interesting and fun. Another question is about students' need for learning media and effective and efficient learning content in learning physics online. The results of the student need analysis survey are obtained, as shown in Figure 5.

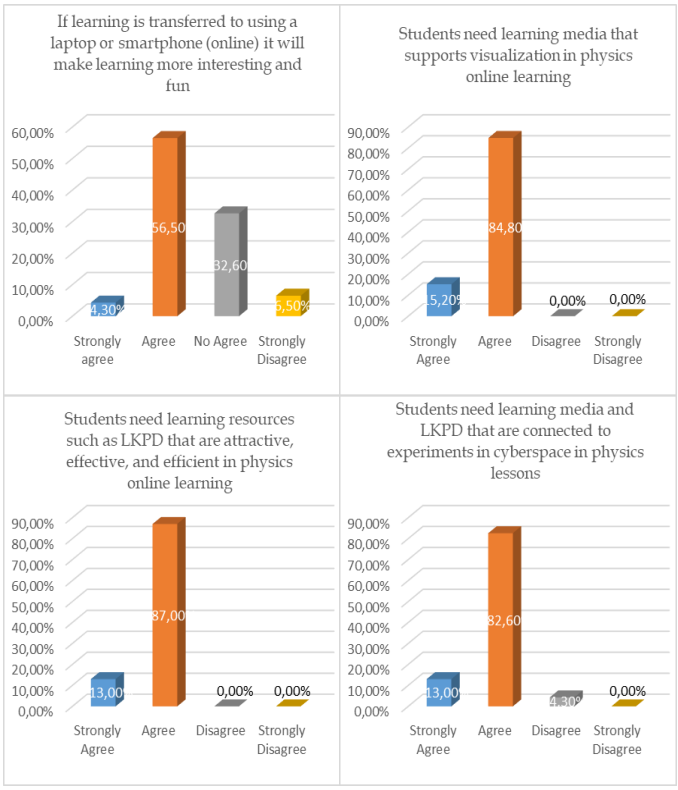

Figure 5. Results of the Student Needs Questionnaire in E-learning.

In the survey results in the picture above, from each question item, the majority of students agree with the option which states that physics learning will be more interesting and fun if it is transferred and integrated with a system that can be accessed with an internet connection via a smartphone or laptop. In addition, the majority of students also agree that there is a need for learning that is equipped with learning content that is packaged in such a way as to visualize virtual experiments presented through integrated, communicative, effective, interesting, and easily accessible media. So that it attracts higher interest and participation of students in teaching and learning activities and still makes learning effective even though it is online. In this case, the media to be used is based on the MOOC system.

The analysis of needs in this study can be a reference and benchmark for current educational needs. From the description of the results of the analysis survey research data above, it can be seen that the high interest of students in need for a learning device based on a MOOC system as a communicative, integrative, and effective medium with a variety of interesting features and content in learning. This advantage can be a big asset to maintain the quality of education and increase the attractiveness of this learning.

Based on the survey results of each question item regarding problem analysis and student needs analysis, it can be concluded that there is a need for MOOC-based e-learning for high school students especially in physics lessons. Thus the results of the survey conducted can meet the needs of the analysis in this study.

Conclusion

The needs analysis for e-learning based on the Massive Open Online Course (MOOC) for high school students consists of 2 indicators: analysis of students' problems and needs. Based on the study results, it was found that there was a need for MOOC-based e-learning for high school students with a high category level. Thus, the steps to be made after this are developing learning tools to meet these needs.

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