Analysis of the Needs for the Development of Moodle LMS-Based Interactive Learning Media in High School Physics Subjects

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Abstract: The purpose of this research is to develop of Moodle LMS-Based interactive learning media at SMAIT Ulil Albab Batam Class XI in physics subject. The research used descriptive method which aims to capture and present the desired facts, realities, symptoms, and events appropriately. The research involved 48 SMAIT Ulil Albab Batam students and 31 Physics MGMP subject teachers in Batam City. The questionnaire developed consisted of 18 question items for students and 19 question items for teachers based on four indicators then analyzed using descriptive statistical analysis techniques. The result showed that the average 3.40 for students and average 3.38 for teachers which is categorized as very high, it is necessary to develop interactive learning media as learning media.

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Introduction

In order to prepare schools in the industrial revolution era 4.0 and fulfill the third Nawa Cita, namely "Building Indonesia from the Outskirts by Strengthening Regions and Villages within the Framework of a Unitary State", the Ministry of Education and Culture (Kemendikbud) developed the School Digitalization program (Kominfo.go.id, 2019). It is confirmed according to (Bandung City Education Office, 2017a) in the book "Parents Education Series: Educating Children in the Digital Age," which states that the younger generation in Indonesia is a digital generation. The digitalization of schools is a new breakthrough in the world of education. This program utilizes the development of information technology in various aspects of the teaching system (Bandung City Education Office, 2017).

The school digitization program is one of the driving school programs, where various digital platforms aim to reduce complexity, increase efficiency, add inspiration and a customized approach (Kemendikbud.go.id, 2021a). The Mobilizing School Program is an effort to realize the vision of Indonesian Education in realizing an advanced Indonesia that is sovereign, independent and has personality through the creation of Pancasila Students. The Mobilizing School program focuses on developing student learning outcomes holistically, including competence (literacy and numeracy) and character, starting with excellent human resources (principals and teachers). The Mobilization School Program is a refinement of the previous school transformation program. The Mobilizing School Program will accelerate public/private schools in all school conditions to move 1-2 stages more advanced. The

program is carried out in stages and integrated with the ecosystem so that all schools in Indonesia become the Driving School Program (Kemendikbud.go.id, 2021b).

One of the efforts to support the Mobilization School Program is changing the learning method from conventional to interactive. Interactive learning requires media capable of supporting an interactive learning process. Interactive learning media that has taken advantage of technological developments can make learning more engaging, practical and fun. It provides convenience for both teachers and students because information and communication technology will significantly assist in learning activities in class.

Designing good media must pay attention to several important points that can make a media said to be good for implementation in the world of education. Learning media must pay attention to the user's encouragement to use it to increase their interest in using the media (Yunus, 2019). The learning media must also be designed to be interactive by paying attention to good multimedia development components. Interactive learning media must be integrated into elements such as sound or audio, animation or moving images, video or audio-visual, text, symbols, and other media components. These elements become a single unit connected synergistically and symbolic of providing good benefits for users in studying material content in the media concerned (Muharika & Agus, 2019).

The problem that often occurs today is that teachers have not used innovative learning models that can increase student motivation in learning (Ari & Wibawa, 2019). Teachers are more dominant in using conventional learning models so that students feel bored when studying in class; this will affect the achievement of knowledge competence in learning material that is less than optimal, especially in learning physics. The learning process should attract students' attention and interest to achieve learning objectives optimally (Marhayani & Wulandari, 2020). Less interesting learning will make students feel bored in learning, affecting low student learning outcomes. Designing innovative learning is a difficult challenge for teachers to realize, so inappropriate learning designs impact student learning outcomes (Putri et al., 2018).

Paying attention to the problems above, it is appropriate that innovation is carried out in learning physics. If what happens is that most of the learning activities are carried out by students, then in this study, efforts will be made to increase students' understanding through developing skills in the era of the industrial revolution 4.0, which plays a vital role in creating the civilization of a country which is characterized by advances in technology and information to increase motivation and achievement of students.

Research Method

The method of research used was a descriptive research framework, which aims to appropriately capture and present the desired facts, realities, symptoms, and events (Raco, 2010). This research involved 48 SMAIT Ulil Albab Batam students and 31 Physics MGMP subject teachers in Batam City, Indonesia. They were asked to fill out online forms and closed questionnaires that attempted to interpret what aspects were required to develop instructional media. The questionnaire was in the form of questions for teachers consisting of 19 questions and for students consisting of 18.

The instrument used was a question in the form of multiple choice. The collected data were then analyzed using descriptive statistical analysis techniques. Descriptive statistics describe or provide an overview of the object to be studied, sample data or population as it is, in this case, descriptive statistics without conducting analysis and making general conclusions. Several data recipes in descriptive statistics can be used, such as tables,

frequency distributions, graphs, and group explanatory data through the mode, median, mean value, group variation, and standard deviation, as seen from the indicators. The number of items for each student and teacher questionnaire indicator can be seen in Table 1.

Table 1. Indicators of Student and Teacher Needs Questionnaire

Indicator of Need Analysis	Number of Questions Item (Students)	Number of Questions Item (Teacher)
Student Analysis	5	4
Analysis of learning problems	8	9
Analysis of learning setting	3	2
Analysis of the objective	2	4

Source: (Tegeh dan Made, 2014)

The questions in Table 1 were made with five choices (strongly agree 5, agree 4, undecided 3, disagree 2, strongly disagree 1) for part 1. 5 choices (always 5, often 4, sometimes 3, rarely 2, never 1) for part 2. Before the questionnaire was distributed to students and teachers, two experts validated the instrument first. If the expert has stated that the instrument is valid, then the instrument can be used for surveys. Questionnaire results of analysis of the needs of Moodle LMS-based interactive learning media in Batam City were analyzed using descriptive statistics, namely the average and percentage level of need for Moodle LMS-based interactive learning media for each indicator can be seen in Table 2.

Table 2. Category Analysis of Needs

No	Range average score	Categories	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

Source: (Yennita et al., 2019)

Results and Discussion

The development of interactive learning media aims to help improve the quality of learning resources available in schools, facilitate students in obtaining lessons, improve students' abilities in the academic field, as well as increase media learning for teachers in carrying out learning activities in class and seek to increase students' knowledge and understanding of physics learning in high school.

The first stage in this study was observation to collect information directly about the learning process at SMAIT Ulil Albab Batam and MGMP Physics Subject in Batam City. The response from the Physics teacher revealed this; several teachers still used conventional methods in the learning process in class. The teacher's more active activity by lecturing does not have a real impact on increasing student potential. This method needs more activity from students; instead, students only listen, and record information obtained from the teacher's explanation. Learning will feel boring, and students' motivation to participate in learning will decrease, decreasing student learning outcomes.

Questionnaires were given to students and teachers to find information about the needs of students and teachers for media development in the learning process. The needs analysis questionnaire for developing interactive learning media is based on the range of needs analysis category scores. Based on research instruments, there are 4 (four) indicators (Tegeh and Made, 2014), including student analysis, analysis of learning problems, and

analysis of learning processes and objectives. Based on the 4 four indicators of data analysis, it was found that information had been obtained on the analysis of the needs of students in the development of interactive learning media according to the indicators.

The following is presented in Table 3 of student needs analysis data and Table 4 of teacher analysis data related to media development according to indicators.

Table 3. Analysis of Student Needs

No	Questions according to indicators	Student's Response
1.	Student Analysis	- Out of 48 students gave answers with the conclusion that students experienced difficulties in the learning process - Students experience difficulties because of the limited learning media from the teacher - Students more easily understand visual-based material - The material presented is difficult to understand
2.	Analysis of learning problems	- Teachers do not use learning media in the learning process - Interactive learning media helps increase student motivation
3.	Analysis of learning setting	- Learning methods still use conventional - The material taught is theoretical and not contextual
4.	Analysis of the objective	- It is easier to understand the contextual learning process d - It's easier to understand interactive media-based learning

Table 3 analyses students' needs in developing learning media in class, especially for high school physics subjects. Based on Table 2, students experience difficulties in understanding the material, as stated by Sigit (2018), who found that students' problems include difficulties in understanding the material and the need for media to help motivate learning. The type of media used influences students' motivation to learn physics. It happens because the learning media used is less effective. In addition, in the revolutionary era of 4.0, there is a need for learning innovation by utilizing technology and information to increase student motivation and achievement.

Table 4. Teacher Needs Analysis

No	Questions according to indicators	Teacher's Response
1.	Teacher Analysis	- Learning methods are still conventional - Difficulty in determining the learning media to be used
2.	Analysis of learning problems	- The lack of media used, the media used by teachers include Quizizz, Google Form and Canva - Requires interactive learning media
3.	Analysis of learning setting	- Very rarely use of media during the learning process
4.	Analysis of the objective	- Do not have their own media for the learning process in class, still using available media such as Quizizz, Google Form and Canva

Table 4 Table 2 analyses teacher needs in developing instructional media. Table 4 also shows the media's vital role in assisting the learning process. The material being taught requires props that are not only abstract or can only be imagined. Teaching materials used at this time were only books, practicum tools, worksheets, modules, and others. At the same time, there was the material that brought out students' creativity in learning the material, as is the case with impulse momentum material which explains the nature of objects. It reinforces the need for media development to assist teachers in conveying material effectively. The same

research on media development showed that students need learning media because it can improve their learning outcomes (Meilan Arsanti, 2018).

The relationship between the questionnaire to the categories of needs analysis

Based on the questions on the analysis of the needs of students and teachers through questionnaires, it can be concluded that the category of the relationship between the questions and the categories according to (Yennita et al., 2019), can be seen in Table 5.

Indicator of Need Analysis	Number of Questions Item (Students)	Number of Questions Item (Teacher)
Student Analysis	2.95	3.47
Analysis of learning problems	3.50	3.67
Analysis of learning setting	3.28	3.32
Analysis of the objective	3.88	3.09
Average	**3.40**	**3.38**

The main concern in the learning process in the industrial era 4.0 is using innovative learning models (Ari & Wibawa, 2019). One of the efforts to increase student motivation and achievement is changing the learning method from conventional to interactive. More interesting and fun learning will give a deep impression on students and impact increasing student learning outcomes.

Based on the results of the questionnaire responses to the analysis of student needs according to indicators with an average score of 3.40, categorized as very high, it is necessary to develop interactive learning media in the Physics learning process. So with the results of the questionnaire responses to the analysis of teacher needs according to indicators with an average score of 3.38, categorized as very high, it is necessary to develop interactive learning media as teaching media. Responses to the teacher need analysis questionnaire showed the need for teachers to use learning media; even teachers never used media in the learning process. Teachers use minimal media, and only familiar media are used, such as Quizziz, Canva, PhET Colorado, and Google Form. Furthermore, many exciting media exist, such as H5P, Moodle LMS, Wordwall and Kahoot. Most teachers have hopes for innovation in the development of interactive media.

Overall, based on the results of the analysis of students and teachers, it is necessary to develop good learning media with the following points: 1) Learning media can be easily accessed anywhere and anytime; 2) Learning media can facilitate work in understanding and studying learning material in a learning media; 3) The material used must be following the curriculum used for learning subjects in the media; 4) Learning media must be easy to use for ordinary users, do not let media that should be easy but make it more difficult for users in appearance and effectiveness of other uses; and 5) The media that is made must prioritize simplicity and use (Fransisca et al., 2019).

Conclusion

The result showed that conventional methods did not optimally increase students' learning motivation. Teachers still use conventional methods of in-class learning, resulting in teacher-centered, monotonous, and uninteresting learning. This method proved unable to contribute to improving student learning outcomes. In the industrial era 4.0, teachers are expected to take advantage of technological sophistication. Media innovation needs development, so developing interactive learning media based on Moodle LMS is urgently needed. Interactive media are expected to increase motivation and student learning outcomes to fulfill and support the driving school program. This research is a reference for further

research to develop interactive learning media. The developed media is expected to pay attention to the needs analysis indicators.

Recommendation

The researcher provides recommendations; the needs analysis has identified that teachers and students of SMAIT Ulil Albab Batam need interactive media development in learning physics. Developing interactive media can increase student learning motivation and improve student learning outcomes.

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