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Development of Moocs-Assisted Digital Teaching Materials to Improve Students' Learning Motivation in Business and Energy Materials at Senior High School of Bengkulu City

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Abstract

The purpose of this study was to see students' perceptions of MOOCs-assisted digital teaching materials for work and energy materials. This research uses the research and development (R&D) method and uses the 4D model. The population in this study were high school students in Bengkulu city with a sample of class XI high school students who were in three schools in Bengkulu, namely SMAN 4 Bengkulu City, SMAN 9 Bengkulu City, and SMAN 10 Bengkulu City. The research was conducted from August to November. The research was conducted using a Liket scale instrument, observation sheets, interview sheets, and needs questionnaire sheets. Data collection techniques were also carried out by observation, interviews, and questionnaires. Data analysis was carried out quantitatively with the help of SPSS. This study obtained the result that the current teaching materials are very boring, just printed books. Thus, 78.25% of respondents agree that digital teaching materials are very necessary to increase student learning motivation.
Keywords: *Digital Teaching Materials, Effort and Energy, Learning Motivation, MOOCs*

A. Introduction

There is an increasing popularity of many electronic and spoken communication methods. As a result, this evolution impacts textbooks and other educational resources. All competencies that will be mastered by students through learning activities are displayed in a clear and organized format in teaching materials [1]. The use of teaching materials can improve student performance by assisting students in capturing the concepts being taught. A variety of audiovisual formats are available for use as teaching resources. Audiovisual media, sometimes known as "video", is a type of educational media that combines visual and audio components. Student curiosity and drive for knowledge can both be increased through this medium [2]. Audiovisual media is very important for physics education because it provides visual representations of real world events, natural phenomena, and presentations of physics experiments. It's a fantastic way to encourage curiosity. Students' natural interest must be disturbed, nurtured, and maintained [3].

One way to foster motivation is to create a new form of course or learning. Courses that are held online are the newest educational method that are widely open. There is no limit to the number of participants in the MOOC (Massive Available Online Course), an online course that is free and open to anyone. The content presented in MOOCs is usually presented in video form and is accompanied by document files that can be downloaded and contains material that is in accordance with the material taken [4]. Users can access MOOCs online at any time, and students can choose content that interests them. As an innovative alternative to conventional university courses, massively open online courses (MOOCs) have gained popularity in recent years[5]. MOOCs, which stands for "Massive Open Online Courses", are basically just online classes that anyone, anywhere can take. As an added bonus, anyone from any location or demographic can sign up for massively open online courses (MOOCs).

To sign up for a MOOC, all you need is a MOOC-capable device and a connection to the internet. And most MOOCs are either completely free or very cheap. Because of the unique qualities of MOOCs, they are increasingly being considered as a viable alternative to the traditional model of higher education by a variety of schools, from vocational schools to universities. Because the demand for university education is growing rapidly around the world, especially in developing countries [6]. If you want a higher education from a top college but can't afford to go there every day, large open online courses (MOOCs) may be the answer. Therefore, integrating MOOCs into*setting* Established academics are the main challenge today [7]. MOOCs have many benefits, such as providing open material that can be accessed at any time and from any location (*flexibility*), offers a wide variety of materials that can be selected based on the desired interests, talents, and skills, presenting material in a systematic manner. Lastly, it offers many free versions (although some are paid), and provides certificates [8]

Student interest and engagement can be influenced by the use of video-based teaching materials. That is the reason video media is useful and used as an educational medium [9]. Students are more motivated to learn thanks to the use of video media by teachers in science classes because they are exposed to new teaching methods [10]. As shown by surveys and interviews conducted at Bengkulu City Public High School, textbooks and supplementary materials such as PowerPoint are widely used in the classroom. The Internet has become an increasingly common source for students seeking additional reading material. Many classrooms still rely on tried and true teaching methods; others make use of ICT, but only to access YouTube videos. As a result, students lack motivation and interest throughout the class. As a result of teaching materials that are less interesting, students are less enthusiastic about learning.

Three teachers and 84 students from three different schools representing SMA Negeri in Bengkulu City filled out a needs analysis questionnaire, and the results showed that 71 students agreed with the statement that the current teacher's teaching materials cannot help, support, and increase student learning motivation. And 84 students strongly agreed that additional teaching resources exist as an alternative to teaching materials that are now accessible, such as with the introduction of massive open online courses. Learning resources in digital form that allow students to study independently and from anywhere. Student responses indicated that more than eighty-three percent of those surveyed strongly agreed that current textbooks were failing to inspire students to learn and that other resources were needed. Regarding the need to create MOOCs-assisted digital teaching materials to increase student motivation in business and energy subjects, 81.35% of the three professors surveyed were in the "strongly agree" group.

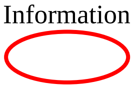
Making MOOCs-assisted digital teaching materials on work and energy is one approach to addressing this problem and increasing student learning motivation. With their ability to streamline, organize, and conserve resources, MOOCs and digital resources are perfect for effort and energy content. The benefits of developing teaching materials using MOOCs include making interesting visuals and learning videos, which will help increase students' knowledge of the subject matter being taught. It's not difficult to understand the mechanics or use the software.

B. Research Methods

The research process uses a development method known as R&D (Research and Development). To create and evaluate the efficacy of a product, researchers use a research procedure known as "Research and Development" (R&D) [11]. This research makes MOOC-assisted teaching materials on work and energy materials using the 4D material development approach (define, design, develop, and dissemination). While previous studies have mostly focused on deployment, this one is more interested in how to get there. This is because the focus of this study is the development of electronic learning resources, particularly in the fields of business and energy..

Image 1. Research design

Information :

 : Research focus

SMAN 4 (Bengkulu City), SMAN 9 (Bengkulu City), and SMAN 10 (Bengkulu City) were the research locations. The research was conducted in November. Class X IPA students and a number of professors of physics from three different high schools in Bengkulu City became the population of this study. Defining this group is helpful for limiting the generalizability [12] and informs decisions about how many samples to use. The reason: the sample only represents a small part of the whole [13] *Purposive sampling* used to select 84 X Science students and 3 physics professors for this study. Methods of collecting information in the form of interviews, questionnaires, and direct observation. Students' need for MOOCs-enhanced

digital course materials was analyzed using observation, interviews, and questionnaires. This had to be done the old fashioned way, with prints. Quantitative methods are used to analyze the data. This is due to the Likert scale used to test data from the research needs questionnaire. Attitudes, views, and perceptions of a person or more about social phenomena can be measured using a Likert scale. The Likert scale provides a means to transform the target variable into a more universal characteristic [14]. Table 1 displays the layout of the Liker scale answer sheet.

Table 1. Likert Scale Score Value [15]

Criteria	Score
Strongly agree	4
Agree	3
Don't agree	2
Strongly disagree	1

A total of 4 levels are available on this particular Likert scale. This application is intended to decide between choices that make respondents feel unsure about their answers because they refer to neutral choices. One of the goals of this scale is to encourage students to think critically about the answers they give and the justification they provide for these responses.

Student responses to the research questionnaire will be entered into the data management system. This is achieved by using a graphical representation of the findings obtained through the use of a data interval approach. Percentage responses for each question were derived using Eq. (1), namely as follows,

$$P_{score} = \frac{score\ obtained}{maximum\ number\ of\ scores} \times 100\% \quad (1)$$

In order to make it easier to read the data from the percentage validation results of the questionnaire for the need for the development of digital teaching materials assisted by MOOCs, the resulting percentage values are analyzed and used as a reference to determine the scale interpretation criteria, as shown in table 2 below,

Table 2. Table of Likert Scale Interpretation [16]

Interpretation	Percentage
Strongly disagree	0% - 25%
Don't agree	26% - 50%
Agree	51% - 75%
Strongly agree	76% - 100%

Based on the established research decision procedure , we made calls on each survey item included in this investigation. If rcount is greater than rtable, it can be safely assumed that the calculation is accurate. Unreliable if ($r_{count} < r_{table}$): rcount value is smaller than rtable value. When determining the validity and reliability of the questionnaire, SPSS was used to analyze each statement and answer option to ensure it was applicable without sacrificing quality. SPSS is a computer tool that facilitates precise and accurate management of statistical data [17]. This aims to check the validity and reliability of the instruments used.

C. Results and Discussion

Results of Student Responses

Students' opinions about physics education were collected using a four-point Likert scale statement: strongly agree, agree, disagree, and strongly disagree. The findings of the student needs analysis questionnaire for digital pedagogical resource creation inform these comments. For example, by looking at the percentage agree/disagree/strongly disagree matrix for the statement "I have difficulty understanding physics lessons", we see that 23 people have a strong level of agreement with that statement, 48 people agree, 12 people disagree, and 1 people totally disagree. In the second chart, 5 respondents strongly agree with Statement 2 (I am interested in studying physics), 39 respondents agree, 39 respondents disagree, and 1 respondent strongly disagrees. This is in accordance with Figure 2.

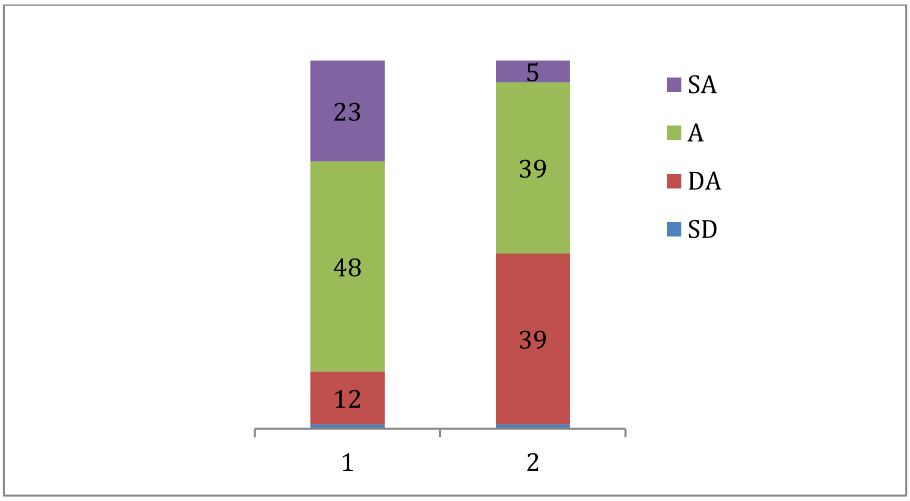


Figure 2 . Diagram of Student Responses to Learning Physics

Figure 2 shows that many students continue to struggle with understanding physics and show little enthusiasm for physics class as a result of this study. Students are detached from the learning process because contemporary physics textbooks are too heavy on formulas and heavy on formulas [18].

There are three statements used to describe students' reactions to the course material: strongly agree, agree, and disagree. Six respondents strongly agreed, 59 agreed, and 19 disagreed with the illustration of the third statement, which read, "I believe that the current teaching tools have not made it easier for me to learn physics material." It can be seen from the percentages in the fourth statement diagram that 37 people strongly agree with statement 4 ("I need additional teaching resources as alternative teaching materials that are now accessible"), 45 people agree with statement 4, and 2 people disagree with statement 4 Based on the percentage in the fifth statement diagram, 24 people strongly agree that current teaching materials are boring, 54 people agree, and 6 people disagree. Figure 3 shows this clearly.

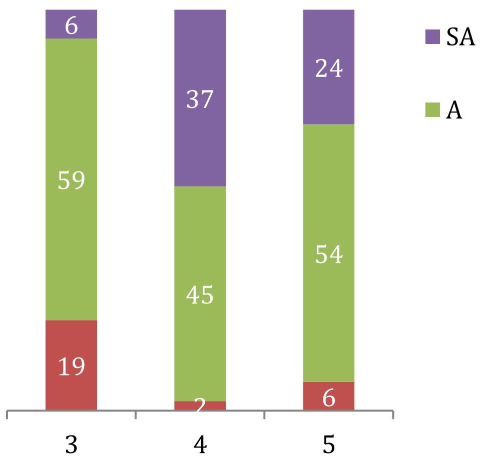


Figure 3. Diagram of Student Responses to Teaching Materials Used in Class

Figure 3 shows that students' access to current teaching materials does not increase their understanding of physics concepts. In addition, children need more interesting educational materials because what they have access to now is not enough, and they need these alternatives to motivate them to learn. Findings such as these are consistent with research [19] which demonstrated the use of instructional resources to enhance teaching and learning processes. However, most of the teaching resources are currently delivered to students in the form of printed textbooks or other printed teaching materials, making them less interesting to read. When students are engaged and interested in what they are reading, learning, and doing, the instructor has played an important role in this process.

You can best understand how students feel about video-based learning from their responses to the three statements, which include strongly agree, agree, and disagree. There were 23 people who strongly agreed with the statement "I am interested in learning physics material through learning videos on the internet", 50 people who agreed, and 10 people who disagreed with this statement. The seventh statement diagram shows that 15% of respondents strongly agree, 58% agree, and 11% disagree with the statement "Physics material given in the form of interactive films is more interesting than the information offered in printed books." In the eighth diagram, 19 respondents indicated that they strongly agreed with the statement, "I prefer content delivered in the form of videos on the internet." There are 56 people who agree with you and 9 people who don't. Figure 4 shows just that.

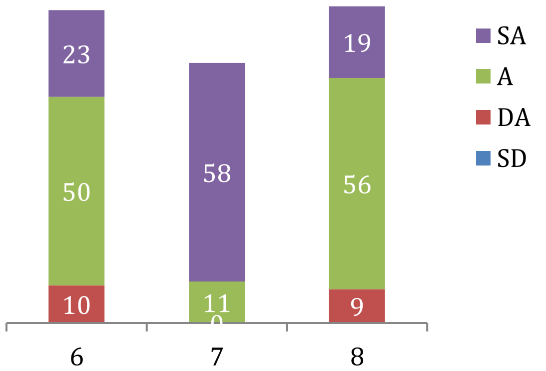


Figure 4. Diagram of Student Responses to Learning Using Video

Figure 4 shows that the majority of students are interested in using online videos as part of their digital learning resources. Research [20] supports the claim that using videos as part of teachers' lesson plans can help them better express their information to students and encourage them to succeed in their studies.

The eight items broken down into “strongly agree”, “agree”, and “disagree” provide an overview of students' feelings about in-person and online education. The percentage of respondents who strongly agree, agree, or disagree with the following statement is illustrated graphically: for Statement 9, the percentage of respondents who strongly agree with the statement is 100%; for Statement 9 the percentage of respondents who agreed was 68; and for Statement 9, the percentage of respondents who disagree is 8. The percentage in the tenth statement diagram shows seven people strongly agree with the statement "I have accessed learning or information on the web (internet)" and seventy-seven people agree with the statement. The percentages for statement 11 on the graph are as follows: 8 respondents strongly agree, 66 respondents agree, and 10 respondents disagree with the statement "I need a learning model other than the standard learning model". There are 62 respondents who strongly agree with the statement "I want online learning" and 17 who agree and 5 who disagree, the percentage in the 12th statement diagram amounts to 95% agree. The percentages in the 13th statement diagram show that 10 respondents strongly agree with the statement "I have an electronic device such as a computer or android that can help me in learning", and 73 respondents agree with this statement. As seen in the pie chart for item 14, 15 respondents strongly agree that "the internet connection I have can help me in the learning process", while 69 respondents agree with this statement. For example, in the case of statement 15, "Studying online can increase my interest in studying physics", 53 respondents strongly agreed, while 31 respondents agreed, as shown in the appropriate percentage chart. In the 16th statement diagram, 7 respondents strongly agreed, 67 agreed, and 10 disagreed with the statement, "I understand the subject matter more easily if the content is related to activities and daily life." Figure 5 shows a typical example.

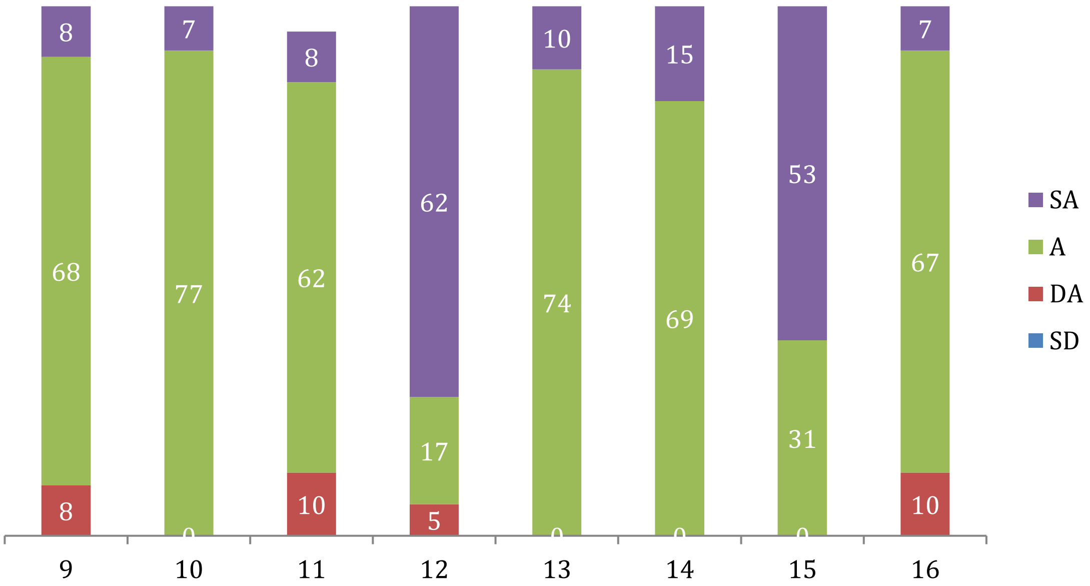


Figure 5. Diagram of Student Responses to Conventional and Online Learning

Figure 5 illustrates these findings, indicating that students need a variety of additional instructional resources, including but not limited to those that can be accessed anytime and from any location, such as computers, cell phones, and the internet, and which are simple to understand and have relevance directly related to students' daily lives. The findings of this study are in line with research [21] which shows that the use of online teaching resources is very effective in arousing students' curiosity and engagement with the subject matter being taught.

One comment broken down into the categories "strongly agree," "agree," and "disagree" shows how students feel about the evolution of digital teaching materials aided by massive open online courses (MOOCs). Based on the percentages in the 17th statement diagram, 23 respondents strongly agree with the statement "I hope MOOCs-based learning grows", while 61 respondents strongly agree with this statement. Figure 5: Results of this study.

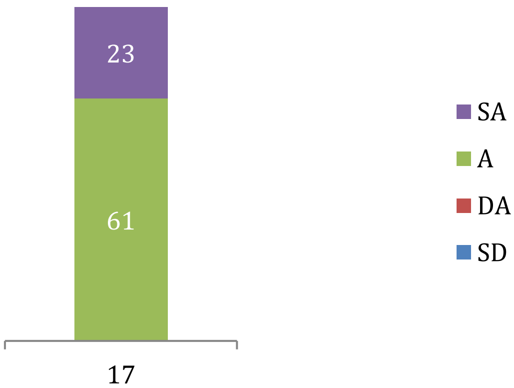


Figure 6. Diagram of Student Responses to the Development of Moocs Assisted Digital Teaching Materials

From what can be seen in Figure 6, it seems that most students prefer using massive open online courses (MOOCs) to create digital teaching resources that can be used both inside and outside the classroom to increase student motivation during the learning process. Based on table 3, if the item produces valid findings when used to calculate the validity test, the item can be considered valid.

Table 3. Item Validity Test Table

Number of Items	r- Count	r-Table	Information
1	0,361		
2	0,221		
3	0,259		
4	0,381		
5	0,341		
6	0,336		
7	0,440		
8	0,299		
9	0,261	0,1807	VALID
10	0,219		
11	0,263		
12	0,200		
13	0,200		
14	0,263		
15	0,401		
16	0,320		
17	0,215		

Using the information in table 3, it has been determined that the calculated r values for all 17 items are higher than the respective table r values. As a result, it can be concluded that all questions submitted to the items are valid.

Table 4. Case Processing Summary Table

		N	%
Case	Valid	84	100.0
	Exluded[a]	0	.0
	Total	84	100.0

The validity of the items evaluated is summarized in Table 4. Based on the data in the table, 84 of the total respondents (N) were considered valid with a validity threshold of 100%. Invalid item or*Exluded* as many as 0 respondents, as shown in the summary above, yielding a percentage of 0%. This 100% overall percentage, based on the number of responses reported (84), is also accurate. The questions used in the reliability test are shown in table 5.

Table 5. Table of Reliability Statistics

Cronbach Alfa	N of Items
.186	17

Table 5 displays the results of the reliability test conducted on the items. Cronbach's Alpha for the 16 questions included in the reliability statistics table is 0.186. The value of r table is compared with the score; with alpha(α) = 0.05 and the sample size is quite large, namely 84 respondents, the r table value is 0.1807. As you can see, the confidence score of 0.186 is much higher than the r table value of 0.1807 (0.186 > 0.1807). Thus, we can conclude that the elements in the query are reliable. Table 6 below displays student feedback collected to determine the extent to which digital instructional resources are needed.

Table 6. Table of Student Needs Response Data Results

Respondent	Grade-Average Score	Highest Score	Presentase (%)
84 high school students	53,23	58	78,25%

Table 6 shows that students at SMAN 4 in Bengkulu City, SMAN 9 in Bengkulu City, and SMAN 10 in Bengkulu City all support using MOOCs to supplement their digital teaching resources for business and energy courses. The 78.25% mark, out of a possible 100, is indicative of this.

Interview Results of Teachers and Students

Three physics teachers and some of their students from three different public high schools in Bengkulu City were interviewed for this study. Based on the results of the interviews that have been conducted, it is known that every school has a reliable internet network (such as Wi-Fi), but this access is limited to students and faculties only. Thus, students use their personal data cards to gain access to the web. In general, the physics laboratory in every school has been well managed, although there are some deficiencies. There is also physics lab equipment, but only a small part of it is usable at the moment. This is gleaned from the instructor's explanation given during the interview, where he said that although technologies such as LCD projectors, Infocus, and other media are available, the focus of most institutions remains on theoretical learning rather than practical applications.

When it comes to course content, activities, instructional resources, media, instructional strategies, and more. Common classroom resources covered in this interview include student workbooks, library books, PowerPoint presentations, and animated videos. Subject-specific explanations, individual student question-and-answer sessions, and class-wide debates are just a few of the strategies educators use. Meanwhile, the educator shares his view that certain students still cannot pay attention in class and keep up with the lesson, even though he has tried his best to get their attention during the course. Although the teacher classified the information about effort and energy as "understandable," she acknowledged that some children still struggle with it. In this scenario, educators need additional teaching resources designed to arouse student interest, particularly in physics. Because increasing students' interest in learning is very important to make progress in physics subjects.

Under these regulations, students may bring cell phones into class to use during class hours. Schools that allow their students to bring communication devices also impose restrictions on their use, such as forbidding students from using them during class hours, unless specifically permitted by the teacher in charge. In addition, each school has its own punishment for bad behavior.

Teachers and students generally support the creation of MOOCs-assisted digital teaching materials, according to interviews conducted by academics, who hope this will facilitate teaching and learning. The findings of this study are consistent with previous research [22], which found that both students and instructors want and need digital teaching resources that include MOOCs. Previous studies have focused on temperature and heat; this one involves developing digital teaching materials on labor and energy.

D. Conclusion

Digital teaching materials for business and energy developed using*massive open online course* (MOOCs) based on findings from surveys and interviews with students. Based on the findings, it is clear that students and educators can benefit from access to digital instructional resources. The validity and reliability of the instruments used are also demonstrated by the findings of this study.

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