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Development of Computer Accounting Teaching Materials Using LMS to Improve Student Learning Outcomes of Class XI AKL SMKN 4 Bandar Lampung

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Abstract: This study develops computer accounting teaching materials using LMS to improve student learning outcomes in class XI AKL. This type of research is development research. The development design uses the ADDIE model with the following stages: (1) Analysis, (2) Design, (3) Development, (4) Implementation, and (5) Evaluation. The test subjects consisted of expert trials consisting of material experts, and media experts, small group trials involving 8 students, and field trials carried out in class XI AKL 3, the class that was given the treatment. Data collection techniques using questionnaires and observations. Data analysis using qualitative and quantitative analysis. Determine the effectiveness of the product, it is done by comparing the learning outcomes of students in class XI AKL 3 as the experimental class with class XI AKL 1 as the control class. The results of the study found that (1) accounting computer teaching materials were developed using the ADDIE model step, (2) accounting computer teaching materials were able to improve student learning outcomes after using development products with a difference in learning outcomes of 0.65 with moderate criteria, which means that product development is effective. in improving student learning outcomes, (3) Class XI AKL 3 learning activities that use accounting computer teaching materials using LMS are more effective than class XI AKL 1 which does not use LMS teaching materials.

Keywords: teaching materials, computer accounting, LSM, learning outcomes

I. INTRODUCTION

The Government of the Republic of Indonesia prepares national education standards. These standards are the minimum criteria regarding the education system in all jurisdictions of the Unitary State of the Republic of Indonesia which is regulated in Government Regulation Number 13 of 2015 concerning National Education Standards. The National Education Standards consist of eight standards, in which the determination of Graduate Competency Standards (SKL) is used as the main reference for the development of other standards. Efforts to achieve SKL can be done by maximizing the learning process in educational units. The learning process is very dependent on the components in it. Wina Sanjaya explains that these components consist of objectives, subject matter, learning methods or strategies, media, and evaluation. Subject matter or more broadly referred to as teaching materials is one component that must exist in the learning process [1]–[3]. Teaching materials are all forms of materials used to assist teachers/instructors in carrying out teaching and learning activities [2], [4], [5].

Vocational High School (SMK) is part of the national education system which has the aim of vocational education, namely to produce skilled workers who have the ability to meet the demands of the business/industry world and are able to develop their potential in adopting and adapting to the development of science, technology, and art. Therefore, Vocational Schools have productive subjects, namely groups of training subjects that function to equip students to have work competencies in accordance with the Indonesian National Work Competency Standards (SKKNI). One of the majors in SMK is Accounting. Graduates from this department require their students to be skilled in accounting for financial statements and be able to apply the preparation of financial reports using computers. One of the productive subjects in the Accounting Department at SMKN 4 Bandar Lampung is Computer Accounting. As a practical subject, Computer Accounting subjects have characteristics in the learning process that are different from other subjects [6], [7].

Based on a preliminary study conducted by researchers, information was obtained that the level of achievement of student learning outcomes in Computer Accounting subjects was not maximized. This can be seen from the results of the odd semester assessment on the Computer Accounting subject for class XI AKL at SMKN 4 Bandar Lampung. With the specified Minimum Completeness Criteria (KKM) of 75, there are 22 students, or 52.77% of the 36 students who have not reached the KKM, and 17 others who have achieved the KKM or 47.22%. Based on the results of the needs analysis, the teacher experienced several obstacles in teaching accounting computer subjects. This is noticed by

the lack of enthusiasm of students in following the lesson, students have difficulty in capturing lessons, and students being less active in learning.

The use of computer laboratory facilities and internet networks has not been used optimally by the school. The carrying capacity of school facilities is sufficient, such as electricity, computers, and internet networks, and the provision of student expertise in accessing the internet is in line with their use in the learning process. Learning that utilizes technology and learning media, should provide the widest possible access and opportunity for students to build their own and build existing learning resources through learning media so that learning objectives are easily achieved. Accounting Computer subjects are one of the productive subjects that are classified as difficult for class XI AKL students. This is because previously in class X students have not obtained the accounting cycle material, both service, and trading companies according to the predetermined Competency Standards and Basic Competencies[8]. Then, in class XI students are required to practice directly and thoroughly from materials related to service and trading companies. During the practical learning process, there has been no construction process of the accounting concepts practiced. This can be seen from the confusion experienced by students when they encounter practical questions that are not similar to the practice questions that have been done before.

The need for teaching materials is supported by the results of a questionnaire given to Class XI AKL students at SMKN 4 Bandar Lampung. The results of the questionnaire on the need for Computer Accounting teaching materials for class XI AKL SMKN 4 Bandar Lampung, are as follows:

TABLE 1 ANALYSIS OF STUDENT NEEDS AGAINST COMPUTER ACCOUNTING TEACHING MATERIALS

No	Analysis of Questions	Identification of Problems	Identification
1	67% of Students know the number of books in the implementation of computer accounting learning	Number of accounting computer book ratios at SMKN 4 Bandar Lampung	The need for teaching materials at SMKN 4 Bandar Lampung
2.	85% of students answered the importance of accounting computer teaching materials	Students answered the need for accounting computer teaching materials	The importance of learning accounting computers
3.	81.15% of students answered that they needed interactive, practical, and can be used learning media facilities.	Students answered that they needed practical learning media.	The need for learning media that supports accounting computer subjects

Source. Results of the Class XI AKL Initial Observation Questionnaire

The use of appropriate teaching materials greatly influences the achievement of student competence in solving accounting computer practice problems. Ika Lestari explains that teaching materials are a set of subject matter that refers to the curriculum used to achieve predetermined competency standards and basic competencies [9]. The existence of teaching materials allows students to learn a competency or basic competency in a coherent and systematic manner so that they are cumulatively able to master all competencies as a whole and in an integrated manner. In fact, learning Computer Accounting at SMKN 4 Bandar Lampung has not used teaching materials or sourcebooks that provide complete material in accordance with Computer Accounting learning at school. The teaching materials used are still limited to practice questions that come from 1 textbook and also use practice questions for the Vocational Competency Examination (UKK) from year to year. The textbooks used are not yet available according to the number of students, where 2 students use 1 textbook in class. In fact, there are many types of teaching materials that can be used by students to increase their knowledge, as revealed by Rohman and Amri "We can find sources of teaching materials/learning materials from various sources such as textbooks, magazines, journals, newspapers, etc., internet, audiovisual media, and so on"[10], [11].

The material for recording cash/cash receipts and disbursements (not from the sale of services) into the MYOB Accounting application is a very important subject in the accounting cycle, so the development of teaching materials is made so that learning is more effective, efficient and does not deviate from the competencies to be learned achieved. To overcome these problems, innovative teaching material is needed that is able to support the learning process so that learning becomes efficient. By looking at today's technological advances, developing teaching materials using LMS is a solution to the problems that researchers found at SMKN 4 Bandar Lampung. With the development of teaching materials using LMS for this learning, it is hoped that students will not feel bored in the accounting learning process. In addition, it is expected that students can understand the material presented by the teaching materials that have been developed [12]–[14]. The development of accounting computer teaching materials was developed so that students have the motivation to be able to bring students to self-study with high motivation and help improve student learning outcomes.

According to Kruse in Rusman web-based learning often has many benefits for students. If designed properly and appropriately, web-based learning can be fun learning and has a highly interactive element so that students remember more of the subject matter being taught [15]–[17].

LMS learning media facilities are expected to be a learning solution to make it easier for students to achieve their desired goals. The characteristics possessed such as interactivity, flexibility, accessibility, and enrichment will make the learning problems encountered will be easier to overcome which will ultimately have a positive impact on improving student learning outcomes. regarding "Development of Accounting Computer Teaching Materials Using LMS to Improve Student Learning Outcomes of Class XI AKL SMK Negeri 4 Bandar Lampung".

II. RESEARCH METHOD

This research uses research and development methods which are often called Research and Development (R&D) [18]. This research was conducted in class XI AKL at SMKN 4 Bandar Lampung. The research method used is research and development with the ADDIE model (Analyze, Design, Development, Implementation, and Evaluation) [19], [20]. The instrument of data collection is by giving a questionnaire. The questionnaire was given to measure the feasibility of teaching materials using LMS from the aspect of learning materials and media. Students were distributed questionnaires to find out their responses regarding the use of teaching materials using the LMS. Measurement of the questionnaire based on the Likert scale. Test the effectiveness of using accounting computer teaching materials using LMS based on the results of measuring student learning outcomes [21]. The average high and low scores of student learning outcomes using the guidelines according to Hake the amount of increase is calculated by the average normalized gain formula [22], namely:

$$N\text{ Gain} = \frac{\text{posttest score} - \text{pretest score}}{\text{maximum value} - \text{pretest score}}$$

The results of the gain calculation are then interpreted using the classification from Hake [22] as shown in Table 2.1 below:

TABLE 2 GAIN CLASSIFICATION

Average normalized gain	Classification
$\langle g \rangle \geq 0,70$	High
$0,30 \leq \langle g \rangle < 0,70$	Medium
$\langle g \rangle < 0,30$	Low

Source [22].

Before it is concluded that the Accounting Computer Teaching Materials Using LMS affects improving student learning outcomes, the data is tested for accuracy. The hypothesis testing used in this study is the similarity test of two averages and the two-average difference test. The similarity test of the two averages was carried out on the initial ability (pretest), while the different test of the two averages was carried out on the n-Gain. Before testing the similarities and differences between the two averages, there are prerequisite tests that must be carried out, namely the normality test and the homogeneity test to determine the form of the next test.

$$H_0 : \mu_{1x} \neq \mu_{2x}$$

Information:

μ_1 = pretest result (x) in the experimental class

μ_2 = pretest result (x) in the control class.

x = student learning outcomes.

Test criteria: accept H_0 if $-t_{1-1/2\alpha} < t < t_{1-1/2\alpha}$ with degrees of freedom $d(k) = n_1 + n_2 - 2$ and reject H_0 for other t values. By determining the significant level $\alpha = 5\%$ chance $(1 - \frac{1}{2} \alpha)$. Testing the similarity of data on the ability of students between the control class and the treatment class using this teaching material was carried out using an independent simple t-test analysis contained in statistical software. The test is carried out based on the tendency of the similarity of the pretest scores obtained = by students so that the two classes are worthy of being research subjects. Conclusions are drawn based on the value of Prob/Significance/P-value $< \alpha$, then H_0 then H_0 is rejected and if the value of Prob/Significance/P-value is $\geq \alpha$, then H_0 is accepted [23].

III. RESULT AND DISCUSSION

A. Result

This research produces a product in the form of computer accounting teaching materials using LMS to be used in Computer Accounting subjects at Class XI AKL. The resulting product is a computer accounting teaching material. The

development of teaching materials is expected to improve student learning outcomes. The first step in this research is a preliminary study with research and information gathering. In learning activities in the classroom, teachers and researchers use learning media in the form of books published by the Ministry of Education and Culture of the Directorate of Vocational Development, entitled Computer Accounting for Class XI Volume 1 2013. Teachers have never used teaching materials specifically for computer accounting. After the researcher conducted a needs analysis, the researcher designed the product. The design stage begins with the storyboard making stage, starting with designing the instructional media components consisting of: (a) the main page, (b) the front page, and (c) the courses page. The design of teaching materials prepared by the author is described in a storyboard consisting of: (a) the cover and (b) the content of the material. The development of accounting computer teaching materials using LMS was made based on a storyboard, then this product was validated by experts in learning materials and learning media. The validation of learning media experts is carried out by an expert who has a minimum of three-level competence (S3) in the field of learning media. The assessment carried out by media experts includes an assessment of accounting computer teaching materials using LMS. Based on the results of the media expert's assessment of the display aspect, a percentage of 65% was qualitatively categorized as "fit for use with revision". Meanwhile, in the aspect of the display, the percentage obtained is 66% which is qualitatively categorized as "fit for use with revision". Some things that need to be revised include giving layout colors, elements, and attractiveness of images in the guidebook. The validation of learning material experts is carried out by experts with a minimum educational background of three strata (S3) in economics learning material experts. Based on the results of the assessment of teaching materials experts on both aspects, the percentage obtained is 80% for the learning aspect and 75% for the presentation aspect of the material, qualitatively categorized as "very feasible to use". Accounting computer teaching materials using LMS were then tested on small groups of eight students. There are three aspects of the small group trial assessment, namely the display aspect, the material presentation aspect, and the benefit aspect. The benefits aspect obtained the lowest average score of 2.90 which was categorized as "decent". Meanwhile, the display aspect and the presentation aspect obtained an average score of 3.25 and 3.27 which were categorized as "very feasible" for use in accounting computer learning in the classroom. Students' comments on accounting computer teaching materials using LMS from small group trials are as follows: (1) The existence of teaching materials using Accounting LMS can facilitate accounting computer learning activities anywhere and anytime, and (2) Overall, the appearance of the learning media is good and visible. The large group trial was conducted in class XI AKL 3 at SMKN 4 Bandar Lampung with a total of 36 students. The assessment of students in large group trials in three aspects the assessment, namely the presentation of the material, the aspect of the display of the material, and the aspect of benefit. The material presentation aspect got the highest average score of 3.40, the display aspect got a score of 3.26, and the benefit aspect got an average score of 3.33. Based on the results of student responses during the large group trial, the average score was 3.33 with the "very feasible" category.

B. Discussion

Research and development were carried out at SMKN 4 Bandar Lampung, the experimental class was class XI AKL 3 and the control class was XI AKL 1. The selection of this class was determined from the results of the equivalence test. To see the equality of students, a homogeneity test was conducted. This test was carried out using the Pretest scores before using the teaching materials in the two classes. Then the value of the Pretest results is calculated using a statistical formula with H_0 : There is equality of ability from student learning outcomes between class XI AKL 3 and XI AKL 1 and H_1 : There is no equality of ability from student learning outcomes between class XI AKL 3 and XI AKL 1. The results of the pretest and posttest classes in the experimental class and control class are shown in the table below:

TABLE 3 PRETEST AND POSTTEST RESULTS OF EXPERIMENT CLASS (XI AKL 3)

Test Type	Student Amount	KKM	Mean	Value Minimum	Value Maximum
Pretest	36	75	56,39	30	80
Posttest	36	75	76,39	50	100

Source. 2022 research results

Based on the data on the cognitive learning outcomes of control class students (XI AKL 1), it is known that the average cognitive learning outcomes of students before learning is applied is 56.67 and the minimum score obtained is 30, and the maximum score is 80. The average obtained is based on cognitive learning outcomes of students after learning activities are 74.14 and the minimum score is 50, and the maximum value is 100.

TABLE 4 RESULTS OF PRETEST AND POSTTEST CONTROL CLASS (XI AKL 1)
TEST TYPE QUANTITY

Test Type	Student Amount	KKM	Mean	Value Maximum	Test Type
Pretest	36	75	56,67	30	80
Posttest	36	75	74,17	50	100

Source. 2022 research results

Based on the data on the cognitive learning outcomes of the experimental class students (XI AKL 3), it is known that the average cognitive learning outcomes of students before the application of learning is 56.39 and the minimum score obtained is 30, and the maximum score is 80. The average obtained is based on cognitive learning outcomes of students after learning activities are 76.39 and a minimum score of 50 is obtained. Based on the results of the pretest and posttest scores in the experimental class (XI AKL 3), then it can be used to determine the effectiveness of learning using computer accounting teaching materials using LMS with the formula N-normalized gain. The results of the normalized N-gain of students' cognitive learning outcomes for class XI AKL 3 obtained an average of 65.28%. According to Hake's criteria, this value indicates that computer accounting teaching materials using LMS are "quite effective"[22]. While the results of the normalized N-gain cognitive learning outcomes of students for class XI AKL 1 obtained an average of 51.55 for the control class. According to Hake's criteria, this value indicates that the accounting computer teaching material is "quite effective"[22]. This study supports research conducted by Basri [24] showing that the development of web-based learning media is feasible to use in the learning process because it can increase the average student learning outcomes from 43% to 86% with a classical completeness rate of 4% to 90 % so that the developed web-based learning media proves to be effective in improving student learning outcomes. Learning that involves all the senses of students makes learning more meaningful and is expected to be a solution to problems faced by teachers and students. In addition, the learning process is not only confined to school, students can also access learning media through computers, smartphones and tablets outside of school as long as they are connected to the internet.

At the development stage, the research resulted in the development of accounting computer teaching materials using a valid LMS whose effectiveness could be seen. To analyze student learning outcomes, pre-requisite tests were conducted first, namely the normality test, homogeneity test, and t-test. If the data is normal and homogeneous, then the next test uses a parametric test. Based on the summary regarding the analysis of the cognitive values of students, it is known that the homogeneity test results with a significance level of $0.52 > 0.05$, so H_0 is accepted and means that the variation in each sample is the same (homogeneous). So, it can be said that class XI AKL 3 and class XI AKL 1 have the same level of ability. The pretest-posttest value data are normally distributed and homogeneous, so the further analysis will be carried out using the independent simple t-test test. The use of the T-test is based on the balance that in this model trial the researcher wants to compare the average value of the experimental group (XI AKL 3) with the control group (XI AKL 1) and compare the conditions before being treated with after being given treatment.

TABLE 5 SUMMARY OF PRETEST AND POSTTEST SCORE ANALYSIS RESULTS

Test	Type Test	Result	Decision	Conclusion
Homogeneity	Levene Test	Sig = 0,52	H_0 accepted	Homogeneous data
t-test		Sig = 0,472	H_0 accepted	There is a significant difference between the learning outcomes of the experimental class and the control class

Source. 2022 research results

Based on the results of the research on the T-test, an analysis will be carried out using an independent simple t-test of 0.472. If the Prob/Significance/P-value $< \alpha$, then H_0 is rejected, and if the Prob/Significance/P-value $\geq \alpha$, then H_0 is received. This means that H_0 is accepted because $0.472 > 0.05$ or there is a difference after being given teaching materials. It can be concluded that accounting computer teaching materials can have an influence on learning outcomes. This statement supports research by Prawiradilaga in his book which states that e-learning is an effective and efficient learning process by using a combination of electronic, digital, and multimedia as learning resources[25]. the availability of learning resources and the creation of learning experiences are important factors in using e-learning. Because in the use of e-learning learning outcomes achieved by students are higher than in classes that do not use e-learning. And also the results of this study are also in accordance with research conducted by Alif Lingga Persada[14]. This study showed that the product effectiveness test using the results of the Independent T-test analysis obtained a value of 6,331. By using the calculated significance level of 5%, the value of 2,000 is obtained. Because $6,331 > 2,000$ then H_0 is rejected. This means that improving student learning outcomes using website-based teaching materials is

more effective than students who do not use website-based teaching materials. This shows that by using LMS media students can more easily learn the material provided.

IV. CONCLUSION

The results of observations of computer accounting learning in class XI AKL SMKN 4 Bandar Lampung can be concluded that learning in class still uses printed books provided in the library. Learning methods that are often used in the learning process in the classroom are also the lecture method, discussion, question, answer, and giving assignments to students. Using this learning method, the teacher plays a more dominant role in the classroom, and students are not fully involved in learning. The use of computer laboratory facilities and internet networks has not been used optimally by the school. The carrying capacity of school facilities is sufficient, such as electricity, computers, internet networks, and the provision of student expertise in accessing the internet is not in line with their use in the learning process. Based on this, this research develops accounting computer teaching materials using LMS to improve student learning outcomes. The process of developing accounting computer teaching materials for class XI AKL refers to the ADDIE development model which consists of five stages, namely Analysis, Design, Development, Implementation, and Evaluation.

In the learning effectiveness test, it is known that the average value obtained by the experimental class is 65.27, this average value is higher than the control class which does not use accounting computer teaching materials using LMS in learning. The average achieved by the control class is 51.55. Thus it can be concluded that the use of computer accounting teaching materials using LMS is quite effective in improving student learning outcomes.

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