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Moodle-based Harmonization Learning Materials Development: Improving Learning Outcomes Office Management Automation Skills

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ABSTRACT

The qualification of the teaching material coordination developed using Moodle media and the effectiveness of the materials developed to improve student learning outcomes. This research is developmental research. The development model used in this research is the ADDIE model. The data in this study are data on the validity of teaching materials that have been validated by material experts, media experts, and learning designers. The data collected are further analyzed descriptively to find out the effectiveness of the educational materials developed and to know the efficacy of the teaching materials tested. The results of the research show that Moodle-based coordination materials are worthy of being used to improve the learning outcomes of alignment subjects among students in the X class of OTKP Vocational Education at Swasta Bina Satria Medan. On the results of the post-test, there was an increase in the student's learning outcome by 0.033 (0.3 < g ≤ 0.7) with a moderate criterion. Furthermore, Moodle-based coordination teaching materials are effective in improving the learning outcomes of student coordination subjects. Based on the t test, the magnitude of the thitung value is 2,187, while the t_{table} value is 0,396. This means that the value of t_{count} > t_{table} (2,187 > 0,396), so the teaching material is declared effective.

KEYWORDS

harmonization learning materials; moodles; learning outcomes.

INTRODUCTION

Teaching materials, in their role as providers of information, are really needed by educators and students as references and main sources of information in learning. In this case, educators are not just teachers; educators are also instructors from companies or IDUKA school partners who are invited to be guest teachers at schools. Therefore, harmonizing teaching materials requires the participation of both parties, namely teachers from the school and instructors from IDUKA, in the preparation process.

Bina Satria Medan Private Vocational School is one of the vocational schools selected as a Vocational School Center of Excellence in 2020. The determination of the vocational school as a vocational school center of excellence is inseparable from the school's success in establishing good and intense collaboration with its IDUKA partners.

Bina Satria Medan Private Vocational School has four skill competencies, including Light Vehicle Engineering (TKR), Motorcycle Engineering and Business (TBSM), Computer and Network Engineering (TKJ), and Office Management Automation (OTKP). One of the skill competencies that is prioritized as a proposal for the 2021 Center for Excellence Vocational School is the OTKP skill competency with its accompanying

IDUKA partner, namely PT Alfa Scoropii. Through draft MoU Number: 115/YPBS-SMK/MOU/X/2020 concerning Collaboration in Curriculum Development Activities, Student Training, Increasing the Competency of Educators and Education Personnel, and the Absorption of Graduates.

Seeing these conditions, the author created this digital alignment teaching material through the e-learning medium Moodle. Moodle, or Modular Object-Oriented Dynamic Learning Environment, is a digital learning platform designed to provide educators, administrators, and students with an integrated system so that learning can be done anytime and anywhere.

According to Herbimo (2020), Moodle may be a program bundle delivered for internet-based learning exercises and websites that employments social constructionist instructional method standards. Moodle is an application of educating and learning concepts and instruments that utilize data innovation, known as the concept of electronic learning or e-learning. Moodle can be utilized openly as an open-source item beneath the GNU permit. Moodle is an application of learning concepts and components that utilize web-based data innovation, which is regularly known as the e-learning concept.

The use of Moodle as a learning medium has also been utilized by various schools and universities as a more effective learning medium for improving student learning outcomes. This is reinforced by the recommendations given by Hachicha et al. (2021), who said that Moodle is one of the applications recommended for users of learning features. Apart from that, Moodle is used as an effective learning medium.

Nurkhalik and Syaichudin (2014) Advancement of Moodle-based instructing materials with respect to investigating portable workstation equipment for preparing members at the Mandiri Business person Center Surabaya. From the results of the analysis, the Moodle media developed can improve the learning outcomes of training participants at the Mandiri Entrepreneur Center Surabaya on hardware troubleshooting training material. laptops. Meanwhile, Shofiyah's research (2016), entitled The Effect of Using Android and E-Learning on. According to the results of the research conducted, there is no positive and significant influence of the use of e-learning on learning outcomes in social studies subjects.

According to Indah (2019: 13), learning results are the capacities that children pick up after going through learning exercisesc. Learning outcomes are authentic evidence that can be used or studied by a teacher or lecturer from IDUKA to see how students are able to understand a particular subject. Learning outcomes are changes obtained after experiencing the learning process (Handayani & Subakti, 2020: 152).

According to Zubaidah (2002) in Fatkhriyah (2014), how to improve learning results is impacted by two fundamental components, to be specific, variables from inside the understudy and components that come from exterior the understudy, or natural components. Inside variables comprise of (1) physical (wellbeing, incapacity); (2) mental (insights, consideration, intrigued, ability, rationale, development, availability); and (3) weariness. Outside variables are: (1) family (how guardians teach, relations between family individuals, domestic air, family financial circumstance, understanding of guardians, social foundation); (2) school (instructing strategies, educational modules, educator and understudy relations, understudy relations with understudies, school teach, learning instruments (learning media), school time, learning benchmarks over estimate, building condition, learning strategies, homework); and (3) society (understudy exercises within the community, mass media, social companions, shapes of social life).

Alignment teaching materials can be inserted into the materials or competency teaching materials owned by the school, whose nature is only to deepen and enrich the material content. According to the Directorate of Vocational High Schools (Directorate of

Vocational High Schools, 2020: 8–9), there are two methods that can be used to develop procedures for aligning curriculum and teaching materials between schools and IDUKA.

Procedure for Alignment of Curriculum and Teaching Materials Method 1: (1) IDUKA, together with SMK, analyzes SMK KD and IDUKA KD; (2) determine the KD to be used; (3) analyze GPA/KD elements and material; (4) determine GPA and material studied; (5) analyze and approve learning and assessment tools; (6) determine learning and assessment tools (adjusted to the learning implementation used). Curriculum Alignment Procedure and teaching materials Method 2: (1) IDUKA provides product examples or describes products produced by the company; (2) IDUKA and SMK analyze the KD needed to make products; (3) add KD results from product analysis to the syllabus; (4) analyze and agree on learning and assessment tools.

Moodle could be a learning stage outlined to supply teachers, directors, and understudies with a effective, secure, and coordinates system for making personalized learning situations. Moodle is an LMS application that's free and can be downloaded, utilized, or adjusted by anybody with a GNU permit. Moodle is an application program that can change over learning media into web shapes. This application allows users to enter a virtual "classroom" to get to learning materials. By utilizing Moodle, we are able make learning materials, tests, electronic diaries, and so on, like a lesson.

It is hoped that the development of Moodle-based teaching materials can help students in the learning process so that they can easily understand the learning material provided by the teacher. According to Amiroh (2012), the advantages of Moodle include the following: (1) Simple, efficient, light, and compatible with many browsers; (2) Very easy installation with support for various languages, including Indonesian; (3) Site management is available for overall site settings, module changes, and so on; and (4) Availability of good user management and course management.

The formulation of the problem in this research is: (1) How are Moodle-based aligned teaching materials suitable for use to improve student learning outcomes in OTKP skill competencies; and (2) How are Moodle-based aligned teaching materials effective in improving student learning outcomes in OTKP skill competencies?

RESEARCH METHODS

This investigate is advancement inquire about within the field of instruction, known as investigate and advancement (R&D). The advancement demonstrate utilized in this inquire about is the ADDIE show. The ADDIE show is an truncation of Examination, Plan, Create, Actualize, and Assess, which was created by Dick and Carry (1996) to plan learning frameworks. One of ADDIE's capacities is to serve as a direct in building preparing program equipment and foundation that's compelling, energetic, and underpins the execution of the preparing itself (Sari, 2017: 93).

This research was carried out at SMKS Bina Satria Medan for the 2023–2024 academic year on the alignment of learning outcomes between schools and IDUKA. The subjects of this research were two classes, namely students in Class X-1 OTKP Skills Competency, totaling 27 students, and X-3 OTKP Skills Competency, totaling 27 students.

Research procedures are the steps taken in research. The research procedure used in this research is the ADDIE model. At this stage, the analysis steps are developed using the development analysis developed by Dick and Carey (in Setyosari 2013). There are ten steps of development analysis according to the Dick and Carey model: (1) examination of needs and objectives; (2) learning examination; (3) examination of learning (understudies) and setting; (4) detailing of execution objectives; (5) creating disobedient; (6) creating learning methodologies; (7) creating and selecting learning instructing materials; (8)

planning and conducting developmental assessments; (9) making modifications; and (10) summative assessment. Execution of this improvement inquire about as it were comes to the eighth step, specifically planning and conducting developmental assessments.

Sadiman (2005: 183) explains the number of trial subjects. The trials are grouped into three categories: one-on-one trials with 2 students, small group trials with 9–20 students, and field trials that involve test subjects on a wider scale. The number of trial subjects in this study is presented in the following distribution: (1) one-on-one trials of 3 students representing ability levels (high, medium, and low); (2) small group trials of 9 students representing high, medium, and low levels of ability; (3) field trials of 27 students, which is the total number of students in one class; (4) show the products that have been developed. After that, carry out one-on-one trials, small group trials, and field trials. Products that have been assessed and validated are then revised based on suggestions for improvements from respondents.

The instrument grid for the validation sheet by material and media experts can be seen in Table 1 below:

Table 1. Material Assessment Instrument Grid in Alignment Teaching Materials by Material Experts and IDUKA Instructors

No	Material Aspect	No. Item	Indicator	Number of Item Value
1.	Suitability of learning objectives	1-2	- Clarity of basic competencies - Clarity of learning objectives	2
2.	Quality of material	3-8	- Accuracy of material content - The truth of the content of the material - Clarity of material content - Systematic content of material - Suitability of material with basic competencies - Completeness of material content	6
3.	Presentation of content	9-12	- Clarity of language - Use of images to support material - Use of video to support material - Ease of understanding the content of the material	4
			Total	**12**

Table 2. Media Assessment Instrument Grid by Media Experts and IDUKA Instructors

No	Media Aspect	No. Item	Indicator	Number of Item Value
1.	Benefits of media	1-3	- Easy to use for learning - As an alternative interesting learning resource - Interesting to use in learning	3
2.	General Appearance	4-5	- Proportional (text and image layout) - Appropriate color proportions	2
3.	Media interactivity	6	- Suitability of font selection	1
4.	Media presentation	7-12	- Suitability of images to material - Application attractiveness - Attractive appearance and material - The writing is easy to read and clear - Image clarity - Video clarity	6

No	Media Aspect	No. Item	Indicator	Number of Item Value
5.	Media design	13-18	- Accurate position of writing, images and videos - Color composition - Attractive cover design - Complete information on the outer packaging - Ease of use of the program - Freedom to choose materials	7
6.	The role of the media	19-23	- Conveys a good center point - The letters used are easy to read - Image layout consistency - Operating system access speed - Program file capacity for ease of application	5
			Total	**24**

Test Validity Test

Test validity can be calculated using the point-biserial correlation formula. This correlation is to test the validity of test items with a correct score of 5 and an incorrect score of 0. The point-biserial correlation formula is:

$$r_{pbs} \frac{M_p - M_t}{S_t} \sqrt{\frac{p}{q}}$$

Information:

r_{pbs} = Point biserial correlation coefficient
P = The proportion of students who answered correctly
Q = The proportion of students who answered incorrectly = 1_{-p}
M_p = Learning using Moodle-based alignment teaching materials which are standardized
M_t = The average score of all students
S_t = The standard deviation of the total score

Table 3. Interpretation of Validity

Range	Category
0,81 - 1,00	Very High
0,61 - 0,80	High
0,41 – 0,60	Enough
0,21 – 0,40	Low
0,00 – 0,20	Very Low

Source: Arikunto (2012 : 89)

If the rpbs value is greater than the table value (rt), then the results obtained are significant, meaning that the question item is declared valid. On the other hand, if the rpbis value is smaller than the table value (rt) at a significance level of 5%, then the results obtained are non-significant. This implies that the test things are pronounced substantial.

Evaluation Stage

At the evaluation stage, researchers evaluated all the activities that had been carried out to assess the feasibility of Moodle-based learning and assess student learning outcomes. Overall, a series of ADDIE model research procedures.

Data analysis technique

Information examination is the method of methodicallly looking and compiling information gotten from meet notes and documentation by organizing, synthesizing, choosing what is imperative, and drawing conclusions so that it is simple to get it for yourself and others (Sugiyono, 2017).

Data analysis is calculated using statistics. The strategy utilized to analyze the information in this investigate was the t-test. The t test may be a measurable test that's utilized to decide whether or not there's a critical contrast between two test implies of two factors being compared. Sometimes, recently testing the speculation, a control prerequisite test is to begin with carried out, to be specific the ordinariness test and the homogeneity test.

First Hypothesis Test

To determine its feasibility, the trial was carried out using a questionnaire sheet, which was analyzed using descriptive analysis techniques. Descriptive analysis is a data analysis technique used to analyze qualitative data from validation results using the technique of calculating average values. The calculation function is to determine the final score ranking for the item in question. The formula for calculating the average value is as follows:

$$P \frac{\sum n}{\sum N} x\ 100\ \%$$

Information:

P = Percentage of eligibility (sought score)

∑n = Number of scores obtained

∑N = Maximum number of scores

The assessment results are analyzed using the criteria presented as in Table 4.

Table 4. Likert Scale Categories

Score Value	Description
5	Very Worth It
4	Worthy
3	Enough Worthy
2	Not Eligible
1	Totally Inadequate

Source: Arikunto (2016:67)

Based on these calculations, the eligibility criteria for media using Moodle are as follows:

Table 5. Eligibility Level Qualifications Based on Percentage

Persentase	Interpretasi
81% - 100%	Very Worth It
61% - 80%	Worthy
41% - 60%	Enough Worthy
21% - 40%	Low Worthy
0% - 20%	Not Eligible

Second Hypothesis Test

Learning is said to be effective if there is a critical contrast within the normal learning results of the test course and the control course. This speculation testing is carried out

utilizing the normal contrast test, or t test (autonomous test t test). The t-test calculation employments a test of the contrast between two populace midpoints (Sudjana, 2016).

$$t \frac{\overline{x1} - \overline{x2}}{s_p \sqrt{\frac{1}{n1} + \frac{1}{n2}}}$$

$\overline{X1}$ = Sample mean1|
$\overline{X2}$ = Sample mean 2
$n1$ = Sample size 1
$n2$ = Sample size 2
$s1$ = Sample standard deviation 1
$s2$ = Sample standard deviation 2
S_p = Combined standard deviation

Hypothesis testing is carried out utilizing the cruel distinction test, or t test (autonomous test t test), since the information is homogeneous and regularly disseminated. The t-test could be a mean contrast test to determine whether there's a noteworthy distinction within the implies of the exploratory course and the control course with a importance level of 0.05 with SPSS 23 computer program. The speculation defined is:

Ho : µ1 = µ2 (there is no difference in the average between the control class group and the experimental class group)

Ha : µ1 ≠ µ2 (there is a difference in the average between the control class group and the experimental class group)

In decision making, Ho is accepted if the significance value is more than 0.05.

RESULTS AND DISCUSSION

Results

The results of expert validation on the quality of learning materials are seen in Table 6.

Table 6. Results of Expert Validation of Learning Material Quality

No	Indicator	Average Indicator	Category
Suitability of Learning Objectives			
1	Clarity of basic competencies	4	Strong valid
2	Clarity of learning objectives	4	Strong valid
Material Quality			
3	Accuracy of material content	4	Strong valid
4	The truth of the content of the material	4	Strong valid
5	Clarity of material content	4	Strong valid
6	Systematic material content	4	Strong valid
7	Conformity of material with basic competencies	4	Strong valid
8	Completeness of material content	4	Strong valid
Presentation of Material Content			
9	Clarity of language	4	Strong valid
10	Usefulness of images to support material	4	Strong valid
11	Usefulness of videos/links to support material	4	Strong valid
12	Ease of understanding the content of the material	4	Strong valid
Total		48	
Average Total		4	
Validation Results			Strong valid

Analysis of Learning Media Validation Results

Validation of learning media includes media benefits, general appearance, media interactivity, media presentation, media design, and media role. The results of expert validation on the quality of learning media can be seen in Table 7.

Table 7. Validation Results of Learning Media Quality

Aspects	Indicator	Average	category
Media Benefits	- Easy to use for learning	4	Strong valid
	- As an interesting alternative learning resource	3	Valid
	- Attracts desire to use in learning	3	Valid
General Proportional	- Appearance (text and image layout)	4	Strong valid
	- Color proportion suitability	3	Valid
Media Interactivity	- Suitability of font selection	3	Valid
Media Presentation	- Suitability of image to material	3	Valid
	- Application attractiveness	3	Valid
	- Attractiveness of appearance with material	3	Valid
	- The writing is easy to read and clear	4	Strong valid
	- Image clarity	4	Strong valid
	- Video clarity	3	Valid
Media Design	- Accuracy of the position of writing, images and videos	3	Valid
	- Color composition	4	Strong valid
	- Attractiveness of cover design	3	Valid
	- Completeness of information on outer packaging	3	Valid
	- Ease of use of the program	3	Valid
	- Freedom to choose material to study	3	Valid
The Role of the Media	- Conveying a good Center Point	3	Valid
	- The letters used are easy to read	4	Strong valid
	- Image layout consistency	4	Strong valid
	- Operating system access speed	4	Strong valid
	- Program file capacity to facilitate application	3	Valid
Total		77	
Total Mean		3,34	
Validation Results			Valid

From table 7, it can be seen that the average total validation value for the quality of learning media is 3.34, with the "Valid" category being in the criteria ($3 \leq Va < 4$). It can be concluded that the quality of the learning media developed is of good quality and can be used.

Analysis of Learning Design Validation Results

Validation of learning design includes learning objectives, learning activities, learning methods, learning media, time, and tests. The results of expert validation on the quality of the learning design can be seen in Table 8 below.

Table 8. Learning Design Validation Results

Aspects	Indicator	Average	Category
Learning Objectives	- Suitability of the formulation of learning objectives	3	Valid
Learning activities	- Suitability of learning objectives at learning activity stage	3	Valid
Learning	- Suitability of method to learning objectives	4	Strong valid

Aspects	Indicator	Average	Category
method	- Suitability of learning methods with learning activities (introduction, core and conclusion)	3	Valid
	- Suitability of method to student characteristics	4	Strong valid
	- Effectiveness of learning methods in learning activities	3	Valid
Learning media	- Suitability of media to learning objectives	4	Strong valid
	- Suitability of learning media with learning activities	4	Strong valid
	- Suitability of media to learning methods	4	Strong valid
	- Suitability of media to student characteristics	3	Valid
Time	- Accuracy of time allocation for each stage of learning activities	3	Valid
	- Time suitability for learning method	3	Valid
Tes	- Test Conformity of test to learning objectives	4	Strong valid
Total		45	
Total Mean		3,46	
Validation Results			Valid

Based on Table 8, it can be seen that the average total value of material expert validation on the quality of learning material is 3.46, "valid," which is within the criteria (3 ≤ Va <4). The validator concluded that the learning design was of good quality and could be used. The results of the feasibility test validation of Moodle-based aligned teaching materials can be seen in Table 9 as follows:

Table 9. Validation data for the feasibility of teaching materials

No	Aspects assessed	Validation	Max Score	(%)	Criteria
1	Material Validation	48	48	100	Very Feasible
2	Media Validation	77	92	84	Very Feasible
3	Validation of Learning Design	45	52	86	Very Feasible
Total Overall Aspects		170	192	88	Very Feasible

Testing the student learning outcomes research instrument consisted of 20 multiple-choice questions with a significance level of 5%, dk = 30, obtained r_tabel = 0.396 if referring to the testing criteria, with the testing criteria being r_count > r_tabel, then the learning outcomes test could be used or was valid. Thus, based on the calculations carried out, it is concluded that the learning outcomes test can be used or is valid.

Instrument reliability is used to determine the certainty of test results. After carrying out calculations, the reliability of the learning outcomes test was 0.848. Next, the instrument was applied during trials 1 (one) and 2 (two). The following is a table of reliability test results using the SPSS 23 application that has been carried out.

Table 10. Reliability Test Results

Reliability Statistics	
Cronbach's Alpha	N of Items
0,848	20

By using a significance level of 5%, the test criteria are as follows: If the sig value is <0.05, then Ha is accepted, and if the sig value is ≥ 0.05, then H0 is accepted. The results of normality test calculations with the help of SPSS 23 can be seen in Table 11 below:

Table 11. Data Normality Test Calculations Using **Uji *Kolmogrov-Smirnov***

Tests of Normality							
class		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Student Learning Results	Experimental Pre-Test	0,115	27	0,200*	0,969	27	0,584
	Pre-Test Control	0,127	27	0,200*	0,966	27	0,503
*. This is a lower bound of the true significance.							
a. Lilliefors Significance Correction							

Based on Table 11. over, it can be seen that the sig esteem in trial 1 is 0.200, where this esteem is more noteworthy than 0.05 (0.200 > 0.05), so Ho is acknowledged, or it can be concluded that the pretest information within the control course is regularly conveyed. Besides, the sig esteem for test course information is 0.200, where this esteem is more noteworthy than 0.05, so H0 is acknowledged, or, in other words, the pretest information for the control course and test course is ordinarily conveyed.

Because the data is normally distributed, it is continued by carrying out homogeneity testing. Homogeneity testing in both classes was analyzed using the Levene test with the help of SPSS 23. The hypotheses tested were:

Ho: The data sample has a homogeneous (same) variance.

Ha: The data sample does not have a homogeneous variance (not the same).

By using a significance level of 5%, the test criteria are as follows:

If the sig value is < 0.05, then Ha is accepted, and if the sig value is ≥ 0.05, then H0 is accepted.

The summary results of the pretest data homogeneity test can be seen in Table 12 below:

Table 12. Pretest Data Homogeneity Test Results

Test of Homogeneity of Variances

Student learning outcomes

Levene Statistic	df1	df2	Sig.
0,338	1	52	0,564

The calculation comes about are displayed in Table 12. over, it can be seen that the sig esteem is 0.564. Since the noteworthiness esteem is more prominent than 0.05, it can be concluded that Ho is acknowledged. This implies that the pretest comes about for both classes have homogeneous change.

After carrying out the prerequisite tests, to be specific typicality and homogeneity tests, where the information is regularly disseminated and incorporates a homogeneous fluctuation, Next, a t-test (independent sample t-test) is carried out with the following decision rules:

1. If the sig value is < 0.05, then there is a significant increase in learning outcomes in class.
2. If the sig value. > 0.05, then there is no significant increase in learning outcomes for the class.

The results of the independent sample t-test to see the significance of increasing student learning outcomes can be seen in Table 13, as follows:

Table 13. Independent Sample T-Test for Increasing Student Learning Outcomes

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference Lower	Upper
Learning Results	Equal variances assumed	3,309	0,075	2,187	52	0,033	8,519	3,896	0,701	16,336
	Equal variances not assumed			2,187	46,774	0,034	8,519	3,896	0,680	16,357

Based on Table 16, it is known that the value of $t_{count} > t_{table}$ (2.187 > 0.396); apart from that, from the table, the sig value is obtained. amounting to 0.033, where this value is smaller than 0.05 (0.033 < 0.05). These results show that there's a significant contrast within the learning results of control and test lesson understudies.

Discussion

The comes about of information investigation gotten from the comes about of trials I and II show that: (1) Moodle-based alignment teaching materials are suitable for use in improving learning outcomes for alignment subjects in the OTKP skills program, and (2) the development of Moodle-based alignment teaching materials is effective in improving learning outcomes for alignment subjects in the OTKP skills program.

In implementing alignment learning using Moodle media, At the beginning, the teacher explains the learning objectives and what activities will be carried out in implementing the learning. The teacher also first teaches students how to use Moodle and the features available in it. After the teacher provides direction and guidance on how to use Moodle in learning, the students then carry out learning activities, namely learning alignment subjects, using Moodle media. In its implementation, the teacher or instructor always controls and accompanies students if they experience problems while learning is in progress.

The material for learning alignment using Moodle is material about Learning Activity 1 New Basic Yamaha) and Learning Activity 2 (New Basic Yamaha). In this learning activity, students carry out various forms of learning activities in Moodle, including reading modules, watching videos, recording important things from what they read and watched videos, and then discussing with colleagues using the discussion column provided. in Moodle. In its implementation, for each topic discussed, an understanding test is also carried out, which students can do in their respective moods.

Learning using aligned teaching materials and Moodle media can make students more enthusiastic about learning; they don't get bored quickly because some of the activities are also presented in video form. Students are also curious to see the continuation of the topics they will study or encounter at the next stage because Moodle is deliberately designed so that students study the material in a complete and structured manner and cannot jump around the material as they, please.

In product development of Moodle-based aligned teaching materials. The advantages of this teaching material are: (1) it is easy to access; that is, by just clicking on the link that is shared, users can immediately use the teaching material; and (2) the features are made according to class X, making it easier for students to use the learning material. Based on Moodle, (3) the questions are made according to the learning material, (4) teachers can utilize technology in implementing learning because the supporting applications are easily accessible, and (5) teaching materials can be used anytime and anywhere by students.

From the results of the questionnaire distributed, it was obtained that the feasibility test assessment from material experts was 100% with very appropriate criteria because this teaching material is in accordance with the material taught in companies and in industry. Furthermore, the assessment from learning media experts was 84% with very appropriate criteria, and the assessment from learning design experts was 86% with very appropriate criteria.

From the appropriate assessment given by the material, media, and learning design validation team for Moodle-based alignment teaching materials, researchers can conclude that Moodle-based alignment teaching materials are suitable for use with students to improve learning outcomes for Bina Satria Medan Vocational School students.

After the teaching materials developed are said to be suitable by experts, the effectiveness of the product is then tested; this can be seen based on the t-test. In this effectiveness test, it was found that the t_{count} value was 2.187 while the t_{table} value was 0.396. This means that the $t_{count} > t_{table}$ value (2.187 > 0.396), so the alignment teaching materials were declared effective. These results show that the teaching materials developed using Moodle are significant in improving the learning outcomes of class X-1 OTKP students at SMKS Bina Satria Medan.

In the current era of technological change, teachers and instructors have a very important role in designing learning that is integrated with technology to facilitate learning access and ultimately improve student learning outcomes. Technology can be used as a supporting tool for students and educators to search for more information. The design of Moodle created in this research is also designed to make it look as attractive as possible so that learning done with Moodle is not boring and avoids feeling bored when following lessons. Using Moodle can, of course, also make learning easier because, if the instructor is unable to teach at school, learning can also be carried out online. With the convenience and attractiveness provided by the Moodle system, it can certainly make students more comfortable learning, so that within the conclusion, it can progress understudy learning accomplishment.

The results of this research are also strengthened by research conducted by Herayanti et al. (2017) regarding the improvement of Moodle-based learning media in fundamental material science courses is viably utilized in learning conjointly moves forward understudy learning results.

Based on this, several things must be done by instructors so that the application of the teaching materials is effective as follows: (1) providing training to instructors regarding the use of technology in learning; (2) school principals can procure and equip school facilities that support the application of technology in learning; and (3) class instructors who understand the application of technology in education can help class teachers who are not yet proficient in utilizing technology for the learning process.

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CONCLUSION

In the development stage, researchers build Moodle, which refers to the flowchart that has been made previously, which includes making teaching materials, making Moodle, making

material feasibility test instruments, media feasibility, and learning design feasibility tests, as well as making revisions or improvements to the media based on input. from media expert validators and the last is to conduct product trials, starting with one-on-one trials with three students with different levels of knowledge, namely high, medium, and low, and conducting small group trials and field trials.

The feasibility of aligning teaching materials based on practitioners from the company, in this case, material experts, obtained a percentage of all aspects of 100%, which is included in the criteria for being exceptionally reasonable for utilize as instructing materials. Based on learning media specialists, the percentage of all aspects is 84%, which is included in the very feasible criteria. Based on learning design experts, the percentage of all aspects is 86%, which is included within the exceptionally attainable criteria. From the three appraisals over, it can be concluded that the mood-based arrangement instructing materials created are exceptionally great at progressing understudy learning results. Implementation was carried out at SMKS Bina Satria Medan. The results of the t-test showed that the t_{count} value was 2.187 while the t_{table} value was 0.396. This means that the $t_{count} > t_{table}$ value (2.187 > 0.396) means that Moodle-based alignment instructing materials are successful in moving forward understudy learning results in alignment subjects. at Bina Satria Vocational School, Medan

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