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Assessment Based on Case Study to Improve Critical Thinking Ability on Blended Learning in the New Normal Era

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ABSTRACT
The purpose of this research and development is to produce an assessment based on the case study that is feasible to use and can improve students' critical thinking skills. The case study assignments developed were adapted to real problems that occur in the world of work. The data were researched and developed using the R & D method, the research model used was adopted from Borg & Gall [1]. The subjects of the research were 10th graders of Online Business and Marketing. To determine the feasibility of the product developed, the instrument developed was validated by an expert validator of assessment and material. The data analysis technique used is in the form of a questionnaire that was a percentage and using a normalized gain analysis (gain score)0. The results of the validation of the assessment experts obtained the "Very Feasible" criteria in the cognitive and psychomotor aspects. The results of the material expert validation obtained the "Very Feasible" criteria. The responses of teachers and students to case study-based assessment products in large class trials received a high response. The increase in student competence can be measured through the pre-test and post-test scores, where the results of the gain score calculation show that students' critical thinking skills increase with the difference in the gain score between the experimental class and the control class of 0.10.

Keywords: *case study-based assessment, critical thinking, blended learning*

1. INTRODUCTION

The Covid-19 virus has brought great changes in various fields, especially in the field of education. One of the striking changes that have occurred in the field of education is that learning activities were initially carried out face-to-face in schools, now learning activities must be carried out online by utilizing various technologies. The existence of these changes certainly requires an educator to always keep abreast of technological developments and always innovate in carrying out learning activities, especially innovating in compiling an assessment instrument.

The assessment instrument is one of the most important aspects of learning activities that are used as a tool to measure students' abilities. Assessment can be interpreted as an activity that aims to use an instrument that can make it easier for teachers to determine the material that has been mastered by students and determine the level of success in the cognitive, affective, and psychomotor domains [2], [3]. A well-constructed assessment instrument will produce a valid and reliable value according to the student's ability.

Vocational High School is a secondary education level that prepares students to enter directly into the industrial world and develop their skills based on the skills chosen according to the needs of the world of work [4], [5]. According to the World Economic Forum [6] that ten skills that will be needed are complex problem solving, critical thinking, creativity, human resource management, teamwork, emotional intelligence, judgment and decision making, service orientation, negotiation, and cognitive flexibility. Some of these skills can be developed for students during learning activities. Critical thinking skills are important for students to be able to make the right decisions and solve various problems in their lives [7]. The ability to think critically will appear in students if, during the learning process in the classroom, the teacher builds patterns of interaction and communication that

emphasizes the process of actively forming knowledge by students [8].

An assessment instrument that can be used to improve critical thinking skills is an assessment based on a case study. Learning based on case studies requires students to be more active in the classroom, the teacher only acts as a facilitator [9]. According to Fakhriyah [10] case study is a learning model that uses real problems encountered in the environment as a basis for acquiring knowledge and concepts through critical thinking and problem-solving skills. Case study-based assessment to determine students' abilities in dealing with a problem, [11]

During the Covid-19 pandemic, learning activities must still be carried out by educational institutions so that the objectives of learning can be achieved, currently, several schools in Indonesia are still implementing blended learning. According to Usman [12] blended learning is learning that combines the application of traditional learning in the classroom with online learning that utilizes information technology. According to research results from Purnomo [13], it is explained that blended learning has the characteristics of being open, flexible, and can be done anywhere. Thus, it can help students to develop themselves in the learning process, according to the learning modalities of each student, [14].

The marketing subject teacher in the observations and interviews stated that the assessment activities in the new normal era were more centred on cognitive assessment, by giving several assignments or practice questions in the form of multiple-choice using the google form. Through this assignment, of course, has not been able to improve students' critical thinking skills. The case study-based assessment is expected to improve students' critical thinking skills and be able to produce objective, valid and appropriate scores according to students' abilities.

Based on this background, researchers are interested in developing a measurable assessment that includes cognitive and psychomotor assessments. The purpose of the research and development carried out is to produce an assessment based on a case study blended learning in Marketing subjects that is suitable for use and to improve the critical thinking skills of class X students of the Department of Online Business and Marketing at SMK Negeri 1 Nglegok.

The novelty of the research carried out is that there is an assignment using a case study that is prepared by adjusting the real problems that occur in the industrial or corporate world so that when students enter the world of work they can solve problems that occur properly. In addition, the assessment rubric developed is structured in detail and adapted to the given case study assignment so that it can produce valid scores and according to students' abilities.

2. METHOD

The research method used is R & D research which aims to produce a case study-based assessment product in Class 10 Marketing Subjects. According to Sugiyono [15], research and development is a research method used to produce certain products and test the effectiveness of these products. The basic competencies that will be developed are implementing a marketing strategy for goods and services and implementing a brand strategy.

The limited trial activity was carried out by providing a case study-based assessment product to class 10 students of the Online Business and Marketing Department of SMK Negeri 1 Nglegok, totalling 15 students. Meanwhile, for the product trial in the large class, 36 students in class X BDP 1 were assigned to the experimental class and the control class was class X BDP 2 with 36 students.

Data collection techniques used are in the form of observation, interviews, documentation, pre-test, post-test and questionnaires. The compiled questionnaire was used for product validation, limited trials and large class trials. The types of data obtained from research and development are in the form of quantitative data and qualitative data obtained from filling out questionnaires.

Research and development method, the researcher adopted the Research & Development (R&D) model of Borg and Gall [1]. The steps are (1) preliminary study, (2) planning, (3) product draft development, (4) content validation, (5) limited trial, (6) design revision, (7) product revision, (8) large class trial, (9) final product revision, (10) case study-based final product assessment. The various stages can be seen in Figure 1 as follows:

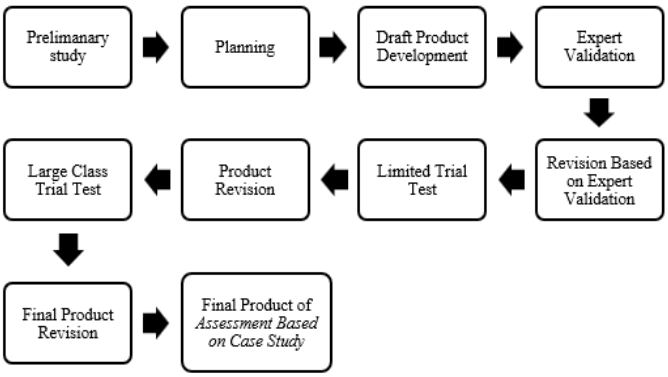

Figure 1 Steps for Research and Development of Assessment based on Case Study [1]

Before carrying out product development, researchers conducted a preliminary study which included literature studies and field surveys by coming to SMK Negeri 1 Nglegok to find out the problems faced by teachers in compiling an assessment instrument. From preliminary study activities, researchers can find out the advantages and limitations of the product to be developed so that the resulting product can be implemented properly. The development of product drafts includes the preparation of questionnaires, and the preparation of case study-based assessment products, including the preparation of blueprints, materials, the preparation of questions in the form of multiple-choice and case studies, as well as making assessments instruments.

Before the product is tested, the researcher conducts expert validation activities to determine the feasibility of the product produced. The results of expert validation are used as guidelines in making product improvements to be better. Validation was carried out by 3 validators, namely 1 expert assessment validator and 2 material expert validators. The next step, before testing the product at school, must test the differentiability of questions and the level of difficulty of each item given to the class X students of the Online Business and Marketing Department of SMK Negeri 1 Nglegok as many as 36 students.

The following is the formula used to test the level of difficulty of the questions in the form of multiple-choice questions [16]

$$P = \frac{B}{JS}$$

Explanation:

B: The number of students who answered the question correctly

JS: The number of students

The results of the calculations can be adjusted to the assessment criteria in table 1 below :

Table 1. Range of P Values (Difficulty Level)

Range of Value	Difficulty Level
0,71–1,00	Easy
0,31–0,69	Medium
0,0–0,30	Hard

Furthermore, the differentiating power test is used to determine students with high abilities and students with low abilities. The formula used is: (Arikunto, 2015).

$$D = \frac{B_A}{J_A} - \frac{B_B}{J_B} = P_A - P_B$$

Explanation:

D : Different power of the question

BA : Differentiating power of questions students number in the top group who answered the questions correctly

BB : The number of students in the bottom group who answered the questions correctly?

JA : Number of students in the top group

JB : The number of students in the bottom group

PA : Difficulty level in the top class

PB : Difficulty level in the bottom class

Based on the calculation results, it can be adjusted to the assessment criteria in table 2 below:

Table 2 Range of Different Power Values

Range Score	Differentiation Power
0,71–1,00	Very Good
0,41–0,70	Good
0,21–0,40	Enough
0,0–0,20	Bad
Negative (-)	Very Bad (need to be replaced)

(Source: [16])

The analytical technique used to process quantitative data from expert validation and product testing can be calculated using the following formula: (Akbar, 2017:82)

$$V = \frac{Tse}{Tsh} \times 100\%$$

Explanation:

V : validation percentage

Tse : total empirical score

Tsh : expected total score

Table 3 Feasibility Criteria

Feasibility Criteria (Percentage)	Criteria
81%-100%	Very feasible to use without making revisions
61%-80%	Feasible for using with minor revision
41%-60%	Not feasible but can be used after major revisions
21%-40%	Not feasible for using
0%-20%	Very unfit for use

(Source: [17])

The data analysis used is the normalized gain technique which aims to see a large increase in students' critical thinking skills after using assessment based on case study product. The normalized gain calculation formula is as follows:

$$< g >= \frac{T2 - T1}{Is - T1}$$

Explanation:

< g >: Normalized gain value

T1 : pre-test score

T2 : post-test score

Is : Ideal maximum score (100)

The feasibility criteria from the results of the product validity analysis are presented in table 3 as follows:

The criteria from the results of the normalized gain value analysis can be presented in table 4.

3. RESULTS AND DISCUSSION

3.1. The results of the Assessment Expert Validation

Aspects of the resulting product assessment include aspects of display design, content feasibility, and language. Validation has been conducted by a lecturer in the Department of Management Universitas Negeri Malang. Here is the quantitative data from the expert assessment validation results, which can be seen in table 5

Table 5 Quantitative Data Validation Expert Assessment Results

No	Competence	Validation Result	Criteria
1	Cognitive	84,8%	Very Feasible
2	Psychomotor (Case Study)	83,5%	Very Feasible

(Source: Processed by researchers, 2021)

Based on the quantitative data in table 5 above, it is known that the results of assessment expert validation on assessment based on case study product in the Marketing subject "Very Feasible" to use. As for the validation results obtained, that are cognitive competence of 84.8% and for psychomotor competence (case study) of 83.5%.

Besides quantitative data, it is also in the form of qualitative data containing suggestions and comments from the validator, which is used as a basis for making product improvements to make it better. Qualitative data from expert assessment validation results can be seen in Table 6 below:

Table 6 Qualitative Data Validation Expert Assessment Results

No	Validator	Comments and Suggestions
1	Validator 1	Case study questions should be varieties The number of multiple-choice questions to determine students' cognitive understanding can be added. Assessment instruments for case study questions, need to be reviewed

(Source: Processed by researchers, 2021)

3.2. Results from Material Expert Validation

The material expert validators are lecturers from the Department of Management at the Universitas Negeri Malang and a class 10 Marketing subject teacher at SMK Negeri 1 Nglegok, the aspects assessed include the feasibility of the material and language. Quantitative data from material expert validation can be seen in Table 7 below:

Table 7 Quantitative Data from Material Expert Validation

No	Competence	Validation Results	Criteria
1	Cognitive	85%	Very Feasible
2	Psiycomotoric (case study)	84,2%	Very Feasible

(Source: Processed by researchers, 2021)

Based on the results of the validation of the material experts above, it is known that the material and language prepared are "Very Feasible" to be used and easier to understand by students. The average results of material validation by the two validators are for cognitive competence is 85% and case study psychomotor competence is 84.2%.

Based on quantitative data, it is known that the product is "Very Feasible" for use. However, researchers still make product improvements based on the results of qualitative data containing suggestions and comments from the validator. The results of qualitative data can be seen in Table 8 below:

Table 8 Qualitative Data of Material Expert Validation Results

No	Validator	Comments and Suggestions
1	Validator 1	Please pay attention to the use of punctuation Can add references for more material
2	Validator 2	The prepared material is equipped with examples so that students more easily understand the material Added pictures to attract students to read For foreign sentences (English) it is equipped with an explanation

(Source: Processed by researchers, 2021)

Qualitative data from expert validation is used as a guide in conducting based on case study product improvement assessments in the 10th-grade Marketing subject of the Online Business and Marketing Department so that the resulting product is better and feasible for product testing at school.

3.3. Results from Limited Trial

A limited trial of the product was given to 15 students in class 10 of the Online Business and Marketing Department who were taken at random and given to 1 Marketing subject teacher. Student and teacher responses to case study-based assessment products include the content presented and language. Activities conducted by students are working on case study assignments contained in the assessment product including cognitive aspects and case studies. Quantitative data from limited trial results can be seen in Table 9 below:

Table 9 Quantitative Data of Limited Trial Results

No	Assessment Indicator	V	Criteria
1	The average score of the teacher's response to the product assessment based on case study	83,75%	Very Feasible
2	The average score of student responses to the product assessment based on case study	84,26%	

(Source: Processed by researchers, 2021)

While the qualitative data from the limited trial results from the teacher's response to the product produced, that are the material that has been prepared to be equipped with real examples that exist in the industrial world or companies so that students understand the material easier and more easily do case study assignments.

3.4. Results From Large Class Trials

The research subjects of the large class product trial were 36 students in class X BDP 1 as the experimental class and the control class in class X BDP 2 with 35 students and 1 teacher in Marketing. The learning process in the experimental class is by using a case study-based assessment, while the learning in the control class is using an assessment prepared by the Marketing subject teacher. Based on observations made by researchers, learning activities that occur in the experimental class are students are very active in participating in learning and exchanging opinions. With the case study task developed, it can train students to think critically so that students can solve problems that occur effectively. While the learning took place in the control class, students were very passive in expressing their opinions.

The pre-test and post-test scores obtained by students were converted into a score of 100. The results of the calculation of the normalized gain value for the experimental class based on the pre-test and post-test scores can be seen in Table 10 as follows:

Table 10 Experimental Class Gain Score

No	Score	P1*	P2*	GS*
1	Highest	71,5	87	0,54
2	Lowest	55	70	0,33
3	Average	63,79	80,56	0,46
4	Standard Deviation	5,14	4,00	0,11
	Criteria GS		Medium	

Explanation: * pre-test (P1), post-test (P2), and Gain Score (GS)

Based on table 10, it can be seen that in the experimental class the average gain score for students' critical thinking skills reached 0.46 with a standard deviation of 0.11. The results of the average gain score are included in the "Medium" criteria (the gain score index criteria are presented in table 4).

While the pre-test and post-test scores in the control class are presented in table 11 as follows:

Table 11 Gain Score Value for Control Class

No	Score	P1*	P2*	GS*
1	Highest	69,5	83	0,44
2	Lowest	52	67	0,31
3	Average	61,14	75,03	0,36
4	Standard Deviation	5,76	4,03	0,07
	Criteria GS		Medium	

Explanation: * pre-test (P1), post-test (P2), and Gain Score (GS)

Based on table 11, it is known that the average gain score in the control class is 0.36 with a standard deviation of 0.07. The results of the average gain score are included in the "Medium" criteria. Although the gain score between the experimental class and the control class is included in the same criteria, that is "Medium", the gain score in the experimental class is higher than the gain score in the control class, with a difference of 0.10. This shows that learning based on case studies can improve students' critical thinking skills.

Besides that, the researcher also gave a questionnaire to determine the teacher and student responses to the product including the content presented and the language. Quantitative data from large class trials can be seen in Table 12 below:

Table 12 Quantitative Data on Large Class Trial Results

No	Assessment Indicator	V	Criteria
1	The average score of the teacher's response to the product assessment based on case study	84%	Very Feasible
2	The average score of student responses to the product assessment based on case study	86,5 %	Very Feasible

(Source: Processed by researchers, 2021)

Qualitative data from large class trials from the teacher's response to assessment based on case study products that are the resulting product can be implemented as an alternative in assessing students to improve students' critical thinking skills.

3.5. Differential Power Test Results and Level of Problem Difficulty

The results of the different power tests on 30 multiple choice questions can be seen in Table 13, as follows:

Table 13 Classification of Differentiating Power Test Results

Level of Test of Differential Power of Questions	Number of Questions	Total
Good	1,2,4,5,6,7,10,12,13,15,16,17,19,21,24,25,27	17
Enough	8,9,11,14,22,26,28	7
Bad	3,18,20,23,29,30	6

(Source: Processed by researchers, 2021)

The results of calculating the level of difficulty for each item can be seen in Table 14 as follows:

Table 14 Classification of Test Results Level of Questions Difficulty

Question Difficulty Level	Number of Questions	Total
Easy	1,2,3,5,18,25,27	7
Medium	4,6,7,9,10,12,14,16,17,19,22,24,26,30	14
Hard	8,11,13,15,20,21,23, 28,29	9

4. DISCUSSION

4.1 Produce an Appropriate Assessment Based on Case Study

The purpose of this research is to produce an assessment product based on a case study in Marketing class X. The assessment instrument is one of the most important aspects in carrying out learning activities, which is used to measure students' abilities after participating in learning. The case study assignments that are prepared refer to the basic competencies of implementing a marketing strategy for goods and services as well as implementing a brand strategy.

The product that was produced before the trial was carried out to schools had met the eligibility criteria of the assessment expert validator and material expert validator. Appropriate assessment instruments can be used by teachers to measure valid student abilities and as guidelines in developing evaluation tools. This is in line with the results of research conducted by Mu'awanah [18], Susilaningsih & Luthfiyah [19] that the case study-based assessment instrument is feasible to use to measure student competence.

The case study assignments that are prepared relating to real problems that occur in the industrial or company world. It is intended that students when entering the world of work can solve problems that occur correctly and effectively. The case studies that have been compiled are related to how to implement a marketing strategy for goods and services in the industrial world and how to solve problems when the strategies used are not effective. In addition, the case study task developed is also related to how to implement an effective brand strategy so that consumers will always remember it. Thus, students can apply marketing strategies for goods and services and apply brand strategies which are one of the important aspects of doing marketing.

The advantage of the developed product is that it can be implemented in blended learning. The resulting product can be used as an alternative in making assessments in the new normal era. This is in line with research conducted by Purnomo [13] that blended learning has characteristics that are open, flexible, and can occur anywhere. In addition, the material developed is equipped with interesting examples and pictures so that students are easier to understand the material.

The assessment based on the case study product developed has met the feasibility criteria based on the results of expert validation and limited trials. Based on the results of the calculation of the percentage value shows the criteria "Very Feasible". The results of developing a proper assessment can provide benefits for teachers, that is making it easier for teachers to make valid and reliable assessments in blended learning in the new normal era. In addition, it also makes it easier for the teacher to explain the material because it is equipped with interesting examples and pictures so that students more easily understand the material. This is in line with the results of research conducted by Wachyudi, et al [20], Kurniawan, et al [21], Sylvia [22] that the case study-based assessment instrument is feasible to use to measure student competence.

4.2 Assessment Based on Case Study on the Blended Learning Which Can Improve Students' Critical Thinking Ability in the New Normal Era

The purpose of this research and development is to produce an assessment that can improve students' critical thinking skills after working on case study assignments contained in case study-based assessment products about marketing strategies for goods and services and brand strategies. To measure students' cognitive, an assessment instrument in the form of multiple-choice questions is used according to the instructions in which each correct answer will get a score of 1 and if an incorrect answer will get a score of 0. In addition, students also work on assignments in the form of case studies to train students. critical thinking skills. Providing feedback in conducting assessments has a positive impact on learning activities and also develops students' thinking habits [23], [24], [25].

Critical thinking skills will emerge in students during the learning process in the classroom, the teacher builds a pattern of interaction and communication that emphasizes the process of actively forming knowledge by students [8]. To find out an increase in students' critical thinking skills, an analysis was carried out using the normalized gain score technique. From the results of the gain score analysis, it shows that there is a difference in the gain score between the experimental class and the control class, namely the gain score for the experimental class is 0.46 with the "Medium" criteria

and the gain score for the control class is 0.36 with the "Medium" criteria. Even though it is included in the same category, that is “Medium”, the gain score for the experimental class is higher than the control class. Thus, it can be concluded that case study-based assessment products can improve students' critical thinking skills, especially in Marketing subjects in the new normal era. The results of this study are relevant to research conducted by Asmawati, et al [26], Afifah, et al [27], Puspita, et al [28], Ati & Setiawan [29] which shows that case study-based assessment can improve students' critical thinking skills.

The basic competencies that will be achieved by students are through the competence to apply marketing strategies for goods and services, students are expected to be able to choose or determine the most appropriate and effective marketing strategies for goods and services, where the brand is one of the most important things in making a product. After doing the case study assignments that have been developed students can solve any problems related to the marketing strategy of goods, services and brand strategies. According to Utami & Indriyanti [30], learning with the case study method makes students able to study comfortably because they can explore what is around them and can interact pleasantly with peers.

5. CONCLUSION

Based on the research and development that has been conducted, it can be concluded that; the resulting assessment based on the case study is valid and feasible to use based on the results of expert validation and product testing so that it can be used by teachers to conduct assessments on Marketing subjects.

The resulting product can improve students' critical thinking skills in blended learning in the new normal era. Which is measured from the pre-test and post-test scores between the experimental class and the control class. With this assessment, it is hoped that it can help Marketing subject teachers to produce valid and reliable student grades according to students' abilities.

Suggestions submitted by researchers related to the results of this development research are as follows: to see the level of effectiveness of the products that have been produced, product trials must be carried out in several vocational schools by comparing the pre-test and post-test scores between the control and experimental classes. Making case study questions that are more varied so that students' critical thinking skills can increase.

Can inform the products that have been developed in the subject teachers' meeting (MGMP) Marketing. It aims to determine whether the resulting product is suitable for wider use in several schools.

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