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The Bimasoft Application as Computer Based Test (CBT) Learning Evaluation Media: An Analysis of the Effectiveness using Android

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Abstract

In education, the learning process is very important because it is designed in such a way by applying various methods and learning media in order to improve the quality of education. Therefore, good and bad results can be seen in the student learning process, therefore a qualified evaluation tool is needed. This study discusses the analysis of the effectiveness of the bimasoft application as a medium for evaluating computer based test (CBT) learning using Android. The objectives of this research consist of; 1) to find out the application of the bimasoft application as a medium for evaluating computer based test (CBT) learning using android at SMAN 1 Sumbawa Besar, 2) to determine the feasibility of the bimasoft application as a medium for evaluating computer-based test (CBT) learning using android at SMAN 1 Sumbawa Besar, and 3) to determine the effectiveness of the bimasoft application as a medium for evaluating computer based test (CBT) learning using android at SMAN 1 Sumbawa Besar. The type of research used by the researcher is descriptive quantitative research. Collecting data using observation methods, questionnaires, and documentation. Furthermore, the data were analyzed using descriptive analysis techniques, validity and reliability tests. The results of the study found that the application of the bimasoft application as a medium for evaluating CBT learning using android was very good (84.64%). The feasibility of the bimasoft application as a medium for evaluating CBT learning using android with very very feasible results (92.05%) and the effectiveness of the bimasoft application as a medium of evaluating CBT learning using android with very very effective results (90.69%). So it can be concluded that the use of the bimasoft application as a medium for evaluating computer based test (CBT) learning using Android at SMAN 1 Sumbawa Besar is very effective both in terms of time effectiveness, economy, scoring, objectivity of assessment, and can reduce fraudulent actions.

Keywords: Learning evaluation, Assessment, Computer Based Test, CBT, application, feasibility, and effectiveness

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INTRODUCTION

Indonesia is now entering the era of the digital revolution (4.0), where the use and utilization of the internet greatly affects people's lifestyles (Lutfi et al., 2020). This has a positive impact on the world of education, especially in the learning process which is no longer limited to classrooms, but can be done anywhere and anytime (Wati, 2021; Kalahatu, 2021); (Santoso, 2019). The era of the Industrial Revolution 4.0 requires all education stakeholders to smartly use technology to make work easier and more efficient, but there are still some parties who are not ready to accept and implement this learning conditions, both lecturers, teachers, education staff, and even students (John , 2017). In the world of education, the learning process is very important because it is designed in such a way by applying various methods and learning media in order to improve the quality of education (Miftah, 2013; Mufid, 2018; Nurfalah, 2019). Therefore, good and bad results can be seen in the student learning process, therefore a qualified evaluation tool is needed (Saputra et al.,

2018). The success and completeness of student learning is important to be assessed and measured using an evaluation. The Paper Based Test (PBT) is the most commonly used scoring system. In PBT, the most important media is to use paper as a media for question sheets and answer sheets (Hidayah, 2021). Some of the weaknesses in the implementation of PBT are the color of the text and images are only black and white, the questions are less varied, the questions cannot be randomized automatically so they require several question packages, and the questions presented do not move (Yusro, 2020). The results of the PBT cannot be known directly, so the correction process takes a longer time.

The use of computer based tests (CBT) is considered effective and efficient in student assessments seen from the level of accuracy, style, content used, designed with good navigation and satisfactory level of accessibility. Learning evaluation is more efficient because it has been developed using a computer based test (Murniati, 2017; Pratiwi, 2017; Syarifah, 2020). (Wulan & Rusdiana, 2014). CBT also has its drawbacks despite all its advantages. (Retnawati et al., 2017) mentions "the most basic weakness of the CBT system is the procurement of computers with relatively higher costs, special rooms, and large electrical power". Those weaknesses can be overcome with a new breakthrough, namely the evaluation of computer-based learning using android/smartphones (Purwati et al., 2019). This system replaces the computer as a client using a smartphone/android so that the costs incurred are lower. Besides, the use of computer-based tests can also be combined with using a smartphone. Smartphones are also currently growing very fast, so this can be used as a means of support for the implementation of computer-based tests. Based on the description above, the author takes the title "Analysis of the Effectiveness of the Bimasoft Application as a Learning Evaluation Media for Computer Based Test (CBT) using Android. It is hoped that this research can be used as a reference in determining the application of learning evaluation at SMAN 1 Sumbawa Besar. The objectives of this study are a) to find out the application of the bimasoft application as a medium for evaluating computer-based test (CBT) learning using android, b) to determine the feasibility of the bimasoft application as a medium for evaluating computer-based test (CBT) learning using android. c) Knowing the effectiveness of the bimasoft application as a medium for evaluating computer-based test (CBT) learning using Android.

METHOD

Research on the effectiveness of the bimasoft application as an evaluation medium for computer based test (CBT) learning using android was conducted at SMAN 1 Sumbawa Besar Jl. Garuda No. 1 Sumbawa Besar West Nusa Tenggara, from May 2022 – June 2022. The questionnaire was distributed for 10 days, starting from May 30, 2022 to June 9, 2022. The length of the research within that period was used to conduct observations and distribute questionnaires to obtain responses from informants and respondents. The type of research used in this research is descriptive quantitative research which includes data collection to answer questions regarding the latest status of the research subjects. The population in this study were students of SMAN 1 Sumbawa Besar consisting of the Deputy Head of Curriculum, curriculum team, subject teachers and students of class X and class XI IPA IPS. The sample taken in this study consisted of 1 vice principal of curriculum, 4 curriculum team, and 16 subject teachers. While the sampling for students in this study used a slovin approach so that sampling could be carried out correctly and could represent the population (Riyanto & Hatmawan, 2020). Slovin-based sampling approach is formulated as follows:

$$n = \frac{N}{1+Ne^2}$$

Description:
n = number of samples
N = total population
e = error rate in sampling (10%)

Based on this formula, samples that can be taken in research analyze the effectiveness of the bimasoft application as a medium for evaluating computer based test (CBT) learning using android at SMAN 1 Sumbawa Besar with a population of 556 students are as follows:

$$n = \frac{556}{1 + (556\ x\ 0.1^2)}$$

$$n = \frac{556}{1 + (556\ x\ 0.01\ )}$$

$$n = \frac{556}{1 + 5.56}$$

$$n = \frac{556}{6.56}$$

$n = \frac{556}{6.56}$ n=84.7 rounded to 85 students.

The result of the calculation number of samples is 85 respondents. Sampling to be used as respondents using the purpose sampling method, where all members of the population have the same opportunity to be sampled. The instruments in this study were questionnaires which were distributed and filled out by the waka curriculum, curriculum team, CBT team, subject teachers and students of SMAN 1 Sumbawa Besar. To measure the response of the respondents used 5 Likert scale by giving a score for each answer that is filled in by the respondent. This study uses two types of data sources, namely primary data and secondary data. The following is a description of the primary and secondary data sources, as well as the data sources used, namely:

a. The primary data in this study were obtained from data from questionnaires distributed to the deputy head of the curriculum, the CBT team, subject teachers and students of SMAN 1 Sumbawa Besar.
b. Secondary data in this study were obtained from the results of a literature study conducted by researchers.

Data collection techniques in this study were using observation, questionnaires and documentation. The data quality test conducted in this study is divided into two, namely the validity test and the reliability test. The following is a description of the data quality test:

a. Validity Test

Validity Test is used to measure the quality of the questionnaire used as a research instrument so that the instrument used is valid and the questionnaire is able to reveal something that is being measured (Ghozali, 2018). For the validity test criteria, if r is positive > r table, then the statement item is valid. Meanwhile, if r is negative and r is < r table, then the statement item is invalid. For the analysis of this validity test using the SPSS version 25.0 program, using the Bivariate Pearson correlation (Pearson Product Moment). Each question item that is significantly correlated with the total score shows that the item can provide support to reveal what will be revealed. The correlation formula (Sugiyono, 2010) is as follows

$$r_{xy} = \frac{N\Sigma XY - (\Sigma X)(\Sigma Y)}{\sqrt{[N\Sigma X^2 - (\Sigma X)^2][N\Sigma Y^2 - (\Sigma Y)^2]}}$$

Description:
rxy = Pearson Product Moment validity coefficient
N = Number of subjects
X = Correct score Y = Total score overall

b. Reliability Test

Reliability test is used to measure variable indicators from a questionnaire with a reliable questionnaire if the answer to the statement is consistent from time to time time (Ghozali, 2018). The reliability test used is a one shot or one-time measurement using SPSS

25.0 software which provides facilities for measuring reliability with the Cronbach Alpha static test. A variable is said to be reliable if it gives Cronbach Alpha > 0.60 or 0.60. The data obtained, namely the qualitative data from the closed questionnaire, were analyzed using descriptive analysis techniques. Respondent questionnaire analysis was conducted to determine the average percentage of respondents who responded to the effectiveness of the bimasoft application as a medium for evaluating computer-based test (CBT) learning using Android using the formula:.

$$\text{Respondent's Value} = \frac{\text{Total Score obtained}}{\text{Maximum score}} \text{ x } 100\%$$

Meanwhile, as a basis for making decisions for the feasibility of the bimasoft application, assessment criteria were used which were adapted from the book on the basics of educational evaluation by (Arikunto, 2010) as follows:

Table 1. Decision Criteria

Percentage (%)	Eligibility Criteria	Effectiveness Criteria
81 - 100	Very Eligible	Very Effective
61 - 80	Eligible	Effective
41 - 60	Fairly Eligible	Fairly Effective
21 - 40	Less Eligible	Less Effective
0-20	Not Feasible	Ineffective

RESULTS AND DISCUSSION

The result of data collection in implementation bimasoft application as a medium for evaluating CBT learning using android at SMAN 1 Sumbawa Besar is the data presented in the form of primary data sourced from observation sheets that have been prepared previously. The results of observations made by researchers based on observation sheets obtained a percentage of 86.67% with a very good category in its application with 13 indicators answering yes, and a percentage of 13.33% answering no. This indicates that the questions and tests are still being published by the CBT team of SMAN 1 Sumbawa Besar. During the evaluation activity, there were also problems where some students still entered the wrong user name and password for the test. Assessment of the feasibility and effectiveness of the bimasoft application as a medium for evaluating computer-based test (CBT) learning using Android at SMAN 1 Sumbawa Besar, namely, the Deputy Principal for Curriculum, the curriculum team is represented by 4 people, subject teachers as many as 16 people and students as many as 85 people.

Respondents Deputy Head of Curriculum, Curriculum Team and Subject Teachers

The results of the research on the feasibility of the bimasoft application as a medium for evaluating computer-based test (CBT) learning using Android at SMAN 1 Sumbawa Besar based on the respondents from the curriculum waka, curriculum team and subject teachers were included in the very feasible category with a percentage of 94.19%. The results of the research on the effectiveness of the bimasoft application as a medium for evaluating computer based test (CBT) learning using Android at SMAN 1 Sumbawa Besar based on the respondents from the curriculum waka, curriculum team and subject teachers were included in the very eligible category with a percentage of 96.28%. The following tabulation of the feasibility data for the bimasoft application as a medium for evaluating computer based test (CBT) learning using android at SMAN 1 Sumbawa Besar can be seen in table 2 below.

Table 2. Percentage of feasibility and effectiveness with the respondents of Waka Curriculum, Curriculum Team, and subject teachers

Assessment Criteria	Score Acquisition	Score Max	Percentage (%)	Score	Category
Eligibility	989	1050	94.19%		Very Eligible
Effectiveness	951	1050	96,28 %		Very Eligible

Student Respondents

The results of the feasibility study of the bimasoft application as a medium for evaluating computer based test (CBT) learning using android at SMAN 1 Sumbawa Besar based on student responses were included in the very feasible category with a percentage of 89.88%. The feasibility of the bimasoft application as a learning evaluation medium consists of 10 questions as measurement indicators. The results of the feasibility analysis of the bimasoft application as a medium for evaluating computer based test (CBT) learning using android at SMAN 1 Sumbawa Besar based on student respondents including the very effective category with a percentage of 89.88%. The results of the analysis of the effectiveness of the bimasoft application as a medium for evaluating computer based test (CBT) learning using android at SMAN 1 Sumbawa Besar based on student respondents including the very effective category with a percentage of 90.80%. The following tabulation of data on the feasibility of the bimasoft application as a medium for evaluating computer based test (CBT) learning using android at SMAN 1 Sumbawa Besar can be seen in table 3 below.

Table 3. Validity test of feasibility and effectiveness

Assessment Criteria	Score Acquisition	Score Max	Percentage (%)	Score	Category
Eligibility	3821	4250	89.91%		Very Eligible
Effectiveness	3812	4250	90.80 %		Very Eligible

Validity testing is a step carried out to determine and ensure the research questionnaire used is valid or not. The questionnaire is said to be valid on the condition that the questions contained in the questionnaire are able to prove something that is being measured. The results of the validity and effectiveness tests are described as follows.

The results of the validity test of the waka curriculum respondents, curriculum team, and subject teachers. In this study, a validity test was conducted on 21 respondents. If the item in each statement has rcount > rtable, then the statement is declared valid. In this study, the number of samples (n) = 21 respondents and the degree of freedom (df) can be calculated as 21-2 = 19 and an alpha of 0.05 obtained rtable = 0.3687. So, each statement is said to be valid with rcount > 0.3687. The results of the validity test in this study are:

Aspects of Indicators Rcount Rtable Description

Aspect	Indicators	Rcount	Rtable	Description
Eligibility	K1	0,513	0,3687	Valid
	K2	0,710	0,3687	Valid
	K3	0,902	0,3687	Valid
	K4	0,902	0,3687	Valid
	K5	0,834	0,3687	Valid
	K6	0,467	0,3687	Valid
	K7	0,834	0,3687	Valid
	K8	0,902	0,3687	Valid

Aspect	Indicators	Rcount	Rtable	Description
	K9	0,702	0,3687	Valid
	K10	0,834	0,3687	Valid
Effectiveness	E1	0,472	0,3687	Valid
	E2	0,749	0,3687	Valid
	E3	0,441	0,3687	Valid
	E4	0,711	0,3687	Valid
	E5	0,803	0,3687	Valid
	E6	0,471	0,3687	Valid
	E7	0,497	0,3687	Valid
	E8	0,767	0,3687	Valid
	E9	0,747	0,3687	Valid
	E10	0,672	0,3687	Valid

Based on Table 3 proves that all statement items in the study have a positive correlation coefficient value and a value greater than the rtable value. This proves that each statement item used in the study is declared valid.

The results of the validity of the student respondents

In this study, a validity test was conducted on 851 student respondents. If the item in each statement has rcount > rtable, then the statement is declared valid. In this study, the number of samples (n) = 21 respondents and the degree of freedom (df) can be calculated as 21-2 = 19 and alpha 0.05 and rtable = 0.1796. So, each statement is said to be valid with rcount > 0.1796. The result of the validity test in this study are:

Table 4 Test the validity of the feasibility and effectiveness of student respondents

Aspect	Indicators	Rcount	Rtable	Description
Eligibility	K1	0,237	0,1796	Valid
	K2	0,652	0,1796	Valid
	K3	0,654	0,1796	Valid
	K4	0,65	0,1796	Valid
	K5	0,649	0,1796	Valid
	K6	0,38	0,1796	Valid
	K7	0,668	0,1796	Valid
	K8	0,602	0,1796	Valid
	K9	0,526	0,1796	Valid
	K10	0,553	0,1796	Valid
Effectiveness	E1	0,62	0,1796	Valid
	E2	0,709	0,1796	Valid
	E3	0,438	0,1796	Valid
	E4	0,614	0,1796	Valid
	E5	0,428	0,1796	Valid
	E6	0,569	0,1796	Valid
	E7	0,667	0,1796	Valid
	E8	0,636	0,1796	Valid
	E9	0,631	0,1796	Valid
	E10	0,51	0,1796	Valid

Based on Table 4, it proves that all statement items in the study have a positive correlation coefficient value and a value greater than the rtable value. This proves that each statement item used in the study is declared valid.

Reliability Test Results

Reliability testing is used to test the level of data consistency within a certain period of time and repeatedly, so that it can determine the extent to which the measurements used are reliable. The variable used in the research with Cronbach alpha has a value > 0.60, then the instrument can be used as a reliable data collection and the instrument can be said to be reliable. The results of the reliability test on the research variables can be seen in table 5 below:

Table 5 Reliability test of feasibility and effectiveness of Teacher respondents

Variabel	Cronbach's Alpha	N of Item	Keterangan
Eligibility	0,903	10	Reliabel
Effectiveness	0,838	10	Reliabel

From the reliability test results above, the entire value of Cronbach's alpha for each variable is greater than 0.60. The feasibility variable with Cronbach's alpha value is 0.903, and the effectiveness variable with a value is 0.838. Thus, it can be concluded that all research instruments are reliable.

Table 6 Reliability test of the feasibility and effectiveness of student respondents

Variabel	Cronbach's Alpha	N of Item	Keterangan
Eligibility	0,755	10	Reliabel
Effectiveness	0,781	10	Reliabel

From the results of the reliability test above, the entire value of Cronbach's alpha for each variable is greater than 0.60. The feasibility variable with Cronbach's alpha value is 0.755, and the effectiveness variable with a value is 0.781. Thus, it can be concluded that all research instruments are reliable. Judging from the indicators of questions given to respondents and respondents, there are several indicators that are still said to be feasible with the distribution of data choosing to agree. Judging from the appearance, it has not been able to give a very attractive impression to the respondents, because the display presented is still not much different from the appearance of applications that have been used before. In terms of using the application, it is categorized as very feasible with the percentage still above 90%, meaning that this application is very practical to use because an exam browser is available for testing so there is no need for many steps to open the application. The menu displayed is also complete and easy to understand and understand both in terms of the available buttons, the choice of buttons used, and changing from one page does not take a long time. The results of student respondents indicate that the bimasoft application as a learning evaluation medium is considered very feasible (90.80%) and students are very happy to use the bimasoft application as a learning evaluation medium in schools, because the menus in the application can meet student expectations.

The application also makes it easier for students to know the questions that have been done and have not been done because it displays a list of test questions and there is a doubt button if students are not sure of the selected answer. Actually the application can also display audio and video in making questions but has never been tested on students, but has been tested by the CBT team. The size and type of font displayed in the problem can be seen clearly. Accessing the bimasoft application is also very easy as long as the device used is connected to the internet, so it is not limited by space and time. When students log in to the

application, the test student data will be displayed, the type of subject being tested, and the length of time the test takes. So it can be concluded that the bimasoft application as a medium for evaluating computer-based test learning using Android at SMAN 1 Sumbawa Besar is very feasible to use. Students in accessing the test only need to open the exambrowser that has been installed on each student's android, the student login menu will automatically be presented. To avoid cheating, exambrowser will automatically lock the android display and cannot open other menus on android. This shows that students have less opportunity to cheat by searching for exam answers on the internet. The application also limits that only the username and password on the list of examinees can access the exam questions, and cannot be accessed by more than one device using the same username because the server manages to reset student logins. Server settings are also not too many things to do because it is already set in the excel template used. After students answer the test questions, the student's answers will automatically be recorded and will be directly corrected and assessed according to the score on each question item given and accumulated automatically. In terms of automatic financing, it is cheaper than using paper because there is no need for duplicating questions, but students can simply open the exam browser that they installed earlier.

The security of the answers is guaranteed because they are not stored on the application web server but in the excel template provided when entering the answer key, scores, and test taker data. The method used is only by pressing the refresh button and must be connected to the internet. Student responses using the bimasoft application showed a percentage of 88.33% students felt happy and comfortable using it. Students no longer need to be bothered by filling in their identity such as name, NISN, class, but it is already available on the application. Students feel happy using the application because it can display a choice of doubtful answers, display a list of questions and the time for working on the questions. Students also really hope that the application is always used in every learning evaluation, whether it is during daily assessments, mid-semester assessments, or year-end assessments, this shows a percentage of 91.66%. In terms of time, the teacher no longer corrects student answers because it is automatically done by the application so that student scores can be obtained directly. From an economical point of view, the cost of carrying out the evaluation is cheaper because it does not duplicate questions and answer keys like the conventional paper-based method. In terms of security, the test answer key is guaranteed and will not leak because it is stored in a Microsoft excel file and is not stored on the bimasoft web server. The possibility of students cheating is also very small because the application uses an exambrowser which will lock the android menu display, so students cannot open another browser to look for answers online. Opportunities for students to take screenshots of questions to ask others for answers via messenger or whatsapp applications cannot be done because the android display has been locked. Based on the description above, it can be concluded that the use of the bimasoft application as a medium for evaluating computer based test (CBT) learning using android at SMAN 1 Sumbawa Besar is very effective both in terms of time effectiveness, economy, scoring, objectivity of assessment, and can reduce fraudulent actions.

CONCLUSION

Based on the results of the analysis and discussion in the previous chapter, the conclusions from the results of research on the effectiveness of the bimasoft application as an evaluation medium for CBT learning using Android are as follows:

1. The application of the bimasoft as a medium for evaluating CBT learning using Android has been excellent, this is iindicated by the percentage of achievement of 86.64%.
2. The feasibility of the bimasoft application as a medium for evaluating CBT learning using Android is very feasible, this is indicated by the percentage of achievement based on the distribution of answers from the waka curriculum respondents, curriculum teams, and

subject teachers with a percentage of 94.19%, and responses from students of 89.91% so that the average percentage gain is 92.05% (very decent).
3. The effectiveness of the bimasoft application as a medium for evaluating CBT learning using Android has been very effective, this is indicated by the percentage of achievement of 90.57% (respondents of curriculum waka, curriculum team, and subject teachers), and 90.80% (student respondents) so that the average The average acquisition percentage is 90.69% (very effective).

RECOMMENDATION

Based on the analysis, discussion and conclusions of the research conducted, the following suggestions are given:

1. It is necessary to use the bimasoft application for every learning evaluation activity, be it a daily assessment. made a much more attractive display so that students feel very happy when opening the application. It is necessary to make questions using audio and video for certain subjects such as English or Indonesian subjects.
2. For further researchers, it is recommended to use cross-site (school) research subjects so that they can add wider insight and information.

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