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Development of Learning Outcomes Assessment Instruments Using *Computer Based Test (CBT)*

Akhmad Riandy Agusta [1]

[1] Pendidikan Guru Sekolah Dasar/ Universitas Lambung Mangkurat/Indonesia

E-mail: *[1] riandy.agusta@ulm.ac.id

Abstrak

Penelitian ini bertujuan untuk mengembangan instrumen penilaian hasil belajar menggunakan Computer Based Test (CBT) sebagai upaya guru meningkatkan atau mengembangkan instrumen penilaian hasil belajar untuk merumuskan butir soal dengan menggunakan media penilaian berbasis komputer. Model pengembangan yang digunakan adalah model Dick & Carey dengan sepuluh tahapan. Teknik pengumpulan data menggunakan angket, wawancara dan tes yang kemudian dianalisis secara deskriptif kualitatif dan statistik deskriptif. Hasil penelitian menunjukkan bahwa: 1) Penelitian pengembangan instrumen penilaian hasil belajar menggunakan Computer Based Test (CBT) merupakan penelitian pengembangan Research & Development (R&D) dengan model pengembangan dari Dick & Carey yang terdiri dari sepuluh langkah. 2) Guru sudah mampu merumuskan instrumen penilaian hasil belajar sesuai dengan standar kompetensi, kompetensi dasar serta indikator capaian belajar dengan memanfaatkan Computer Based Test (CBT) yang bisa diakses secara offline atau online yang memudahkan pendidik menginput soal. 3) Instrumen penilaian hasil belajar menggunakan Computer Based Test (CBT) dinilai valid, praktis dan efektif. Hal tersebut ditinjau berdasarkan hasil uji perorangan (ahli materi dan media) dengan rerata skor 4,4 dengan kategori sangat baik dan valid. Kepraktisan ditinjau berdasarkan angket guru dengan rerata skor 102 dengan kategori sangat baik dan angket siswa dengan rerata skor 103,8 dengan kategori sangat baik dan praktis. Keefektifan ditinjau berdasarkan tingkat ketuntasan hasil belajar siswa dengan rerata skor 90,9 dengan kategori sangat baik dan efektif. Perlunya pengembangan instrumen penilaian hasil belajar sebagai upaya meningkatkan kompetensi guru sekali seminggu dalam merumuskan instrumen penilaian atau soal berbasis komputer dalam rangka mengembangkan kinerja guru untuk memajukan mutu pendidikan.

Kata Kunci: ha*sil belajar, CBT, R&D*

Abstract

This study aims to develop an instrument for evaluating learning outcomes using the Computer Based Test (CBT) in an effort to facilitate educators in the input of question banks and be efficient in recapitulating learning outcomes. The development model used is the Dick & Carey model with ten stages. Data collection techniques using questionnaires, interviews and tests analyzed descriptively qualitative and descriptive statistics. The results showed that 1) Teachers were able to formulate learning outcomes assessment instruments in accordance with competency standards, basic competencies and learning achievement indicators by using Computer Based Test (CBT) which can be accessed offline or online that makes it easy for educators to input question bank . 2) This is supported by several factors, namely: the presence of computer laboratories and supporting facilities , educators are motivated to improve self-competence and support students who are enthusiastic about learning innovations in the form of the application of Computer Based Test (CBT) . 2) Research on the

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development of assessment instruments for learning outcomes using the Computer Based Test (CBT) is a research and development (R&D) research development with a Dick & Carey development model consisting of ten steps. 3) The instrument for evaluating learning outcomes using the Computer Based Test (CBT) is considered to be very feasible to use. This was reviewed based on individual test results (material and media experts) with a mean score of 4.4 in the excellent and valid categories . Practicality was reviewed based on the teacher's questionnaire with a mean score of 102 in the excellent category and the student questionnaire with a mean score of 103.8 in the very good and practical category. Effectiveness is reviewed based on the level of completeness of student learning outcomes with an average score of 90.9 with very good and effective categories.

***Keywords**: learning outcomes, CBT, R&D*

Introduction

Education is a human need. Humans in the reality of their lives show that they need a learning process that allows them to express their existence in a complete and balanced way. Humans are not designed to be able to live directly without a learning process first to understand their identity and become themselves. Education is also one of the powerful weapons to fight poverty because the learning process will create a good learning atmosphere if it is given the right portion. To measure the educational progress of a region or country, it is necessary to conduct research and provide an assessment.

Changes in the curriculum paradigm have implications for the evaluation or assessment paradigm. Popham in Widoyoko (2009) defines assessment as an attempt to formally determine the status of students with regard to various educational interests. Therefore, teachers are required to have adequate understanding and ability both conceptually and practically in the field of learning evaluation to determine whether the mastery of competencies as learning objectives has been successfully mastered by students or not.

The Republic of Indonesia is a legal state where all community activities are guided by applicable regulations from the central, provincial and regional governments. Referring to the legal basis for educational assessment standards, it is stated in the Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 23 of 2016 Article 1 paragraph 2 that assessment is a process of collecting and processing information to measure the achievement of student learning outcomes. By conducting an assessment, the teacher as the manager of learning activities can find out the abilities of the students, the accuracy of the teaching methods used, and the success of students in achieving the competencies that have been determined.

In connection with the assessment of learning outcomes which is one of the references for moving to a higher level, schools must also know developments from time to time so that all teaching and learning processes do not tend to be conventional. The current era has changed where humans have found good solutions to facilitate their various activities with the influence of technology. With regard to technological advances, many schools in the archipelago have used and developed various learning methods assisted by technology. The role of the teacher with the help of technology is expected to be a facilitator as well as educating students, as a teacher or educator it is necessary to prepare students so that they can live a good life in the future.

Technology is not only in the form of products or equipment, but also in the form of conceptual thoughts. Humans need to view technology as something that is neutral, namely a means that can be used to make it easier to carry out a task and device activity. According to Alvin Toffler (Pribadi, 2018), who is a leading futurologist, said that human civilization is divided into three main waves, namely agriculture, industry and information technology. Utilization of ICT, especially the use of computers in various fields can improve performance and

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activities carried out quickly, precisely and accurately. This will increase work productivity (Ferdiansyah, 2021) .

Seeing the current phenomenon, the development of the world of education has entered technological facilities, almost from various education service sectors using information system services assisted by cyber physics which greatly affects the efficiency of the performance of education personnel in an effort to realize the industrial revolution 4.0. With the help of education 4.0, educators are expected to be able to consume various technology-based learning strategies that are seen as making it easier for all teacher activities to convey learning messages to students. In line with the development of the current industrial era, the world of education is not inferior to other fields in its media innovations in order to help the effectiveness of learning in the school environment, it is evident that some schools have implemented technology-based learning.

Referring to current technology-based education, it is hoped that the study of educational technology will play a role in facilitating learning from various sectors. This is in accordance with the 2004 definition of educational technology put forward by The Association Educational Communication and Technology (AECT) in Benny (2018) that "*Educational Technology is the study and ethical practice of facilitating learning and improving performance by creating, using, and managing approriate technological processes and resources*". If it is observed from a number of these keywords, the role of educational technology can be interpreted as a study and ethical practice that seeks to assist and facilitate the learning process and improve the performance of people who learn or learner through the creation, use, management, processes, technology and resources that in accordance.

The Computer-Based National Examination (UNBK) is an example of the use of technology in education. According to the Badan Standar Nasional Pendidikan 2017) regarding Prosedur Operasional Standar (POS) for administering national exams, the Computer-Based National Examination (UNBK) is an exam that uses a computer as a medium to display questions and the process of answering them. The expansion of the UNBK implementation is intended to improve the efficiency, quality, reliability, credibility, and integrity of the exam. This shows that UNBK or Computer Based Test (CBT) is a form of educational evaluation activity in the form of student learning outcomes using computers as a medium to make it easier to work on national exam questions or semester exams.

The existence of technology in education is very helpful and facilitates access from various parties, this is also confirmed by a phenomenological study entitled: "*Determining Utility of Formative Assessment Through Virtual Community*", which was carried out by Glassmeyer, Dibbs, and Jensen (2011) from the University of Northern Colorado concludes that the growth of online learning is challenging educators to provide quality education. With the growth of technology-based learning, this has happened, as various schools under the auspices of the South Sulawesi Provincial Education Office and the Sidenreng Rappang District Education Office have pioneered the USBK (Computer-Based Semester Examination) in early March 2018. According to the Ministry of Education and Culture's reference data, the number of data on education units per district/city Kab. Sidenreng Rappang, which has implemented computer-based USBK as many as 74 schools for public/private junior high schools and 44 public/private secondary schools, this is an advancement of education programs in the application of information technology, especially in the district. Sidenreng Rappang.

Before the computer-based national exam application was launched, a CBT (Computer Based Test) application was developed to make it easier for implementing schools to quickly assess learning outcomes. This CBT application

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also has almost the same performance as the UNBK application. This application has been operated by the private sector since 2016 at SMK Negeri 2 Sidrap, this is what underlies the implementation of computer-based semester exams in Sidenreng Rappang Regency.

Based on the observations of researchers who are also USBK and UNBK technicians, there are still many obstacles in the implementation of this computer-based semester exam, including the lack of teachers in information technology, no training for technical guidance or workshops for inputting questions, lack of accommodation costs by the implementing government, the lack of facilities and infrastructure to support computer-based semester exams for remote schools, as well as the lack of honesty scores that result in question leaks. Utilizing CBT applications in the school environment is expected to change the paradigm of paper-based school actors who still do not use CBT, it is necessary to develop learning outcomes assessment instruments that are assisted by CBT applications so that teachers can easily manage the value of learning outcomes and teachers able to streamline time in carrying out the assessment.

Method

This research is a research and development (Research and Development) instrument for assessing learning outcomes using a Computer Based Test (CBT). The development model used is the Dick & Carey (2001) model. Researchers chose this model because this development model is systematic to produce a certain product. The development steps include: (1) needs and objectives analysis; (2) learning analysis; (3) analysis of the learner (students) and context; (4) formulating performance goals or for work; (5) develop test instruments or tools; (6) developing learning strategies; (7) developing and selecting learning materials; (8) designing and conducting formative evaluations; (9) make revisions; and (10) conduct a summative evaluation. This type of research is a strategy to develop an educational product because this research follows a cycle of steps.

The subjects of this study were 2 validators consisting of media experts and content experts, 22 IPA class XII students consisting of 9 male students and 13 female students. SMA Negeri 10 Sidrap has been supported by computer laboratory facilities that are suitable for testing the learning outcomes assessment instrument using Computer Based Test.

Research or development of learning outcomes assessment instruments using the Computer Based Test (CBT) at SMA Negeri 10 Sidrap, which is located at Jalan Victim 40.000 no. 47 Baranti District, Sidrap Regency. The time of the study in February - April 2019 started from observation to data processing.

The techniques used to collect data in this development research are questionnaires, tests and interview guidelines. The following is an explanation of the data collection techniques as follows;

a. Questionnaire

According to Komalasari (2011) "Questionnaire as a data collection tool in non-test assessment, in the form of a series that is submitted to respondents". Questionnaire is an efficient data collection technique if the researcher knows with certainty the variables to be measured and knows what can be expected from the respondents. While the questionnaire used by researchers is a closed questionnaire, according to Arikunto (2010) that a closed questionnaire is a questionnaire that is presented in such a way that the respondent only needs to put a mark on the appropriate column or place. The questionnaires were in the form of a student characteristics questionnaire, an expert questionnaire on learning media content/materials, a design and instructional media expert questionnaire, an individual test questionnaire, a small group test questionnaire and a teacher test questionnaire.

b. Interview

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According to Subagyo (2011) interview is an activity carried out to obtain information directly by expressing questions to the respondents. Interview means face-to-face between the interviewer and the respondent, and the activities are carried out orally. Through interviews, data can be obtained both in the form of qualitative and quantitative, questions and answers that are not clear can be repeated and asked again with a more focused and more meaningful, as long as it does not influence or direct the respondent.

c. Test

Subana, et al. (2000) defines the test as a data collection instrument is a series of questions or exercises used for the knowledge skills, abilities and talents of individuals or groups. The test is used to determine the extent of students' understanding of the subject matter. In this study, researchers used multiple choice tests (multiple choice) presented in a software program.

Data analysis was carried out to obtain an overview of the resulting product. This development research uses two data analysis techniques, namely qualitative descriptive techniques and descriptive statistical analysis. Data analysis was conducted to determine the quality of the learning outcomes assessment instrument using the Computer Based Test (CBT) in terms of validity, practicality, and effectiveness.

a. Qualitative Descriptive Analysis

This qualitative descriptive analysis was used to process the data from the review by material experts and media experts. This data analysis technique is carried out by grouping information from qualitative data in the form of input, feedback, criticism and suggestions for improvement contained in the questionnaire and interview results. The results of this data analysis are then used to revise the product of the learning outcomes assessment instrument using CBT.

b. Descriptive Statistical Analysis

This analysis technique is used to process the data obtained through a questionnaire in the form of a descriptive percentage. The following is a further explanation of the descriptive statistical analysis that will be used.

1. Validity analysis

The analysis of the validity of the learning outcomes assessment instrument using the Computer Based Test (CBT) which was developed uses data obtained from assessments by material expert lecturers and media expert lecturers. The results of the assessment are analyzed through the following steps:

Data tabulation, tabulation of score data on the results of the assessment of learning outcomes assessment instruments is done by grouping the statement items according to the observed aspects.

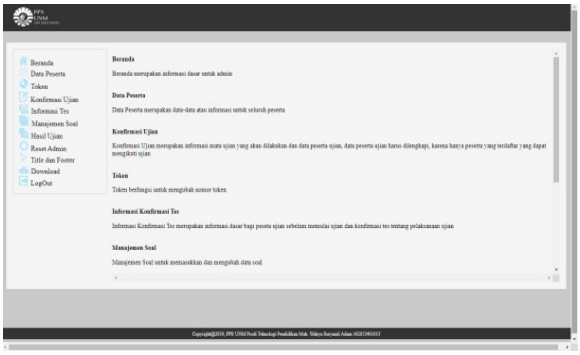
Results and Discussion

Stage of developing and selecting learning materials

This stage is the process of inputting the assessment instrument into the form of a computer-based test in the form of a Computer Based Test (CBT) as a learning outcome assessment tool. This Computer Based Test (CBT) has an offline feature so that there is no need to access the internet which can consume a lot of network data usage, besides that it is also equipped with several components that can make it easier for teachers to efficiently recapitulate final grades. This CBT application can minimize the school's budget for spending funds which in the previous year cost a lot because it was still in the form of a paper test. The following is a CBT product display as follows:

Figure 1. Initial view of admin user CBT

Figure 2. Layout admin user Computer Based Test (CBT)



Validation data analysis by experts

Validation of learning outcomes assessment using Computer Based Test (CBT) using 2 validators as material validators and media validators. The validator is Mr. Dr. Abdul Muis Mappalotteng, M.Pd., as the validator of the material/content while Mrs. Dr. Nurhikmah H, S.Pd., M.Sc., as a media validator. After the validator saw the questionnaire of the learning outcomes assessment instrument using the Computer Based Test (CBT) that had been made, the validator assessed it using a questionnaire that had been designed by the researcher.

a. Data validation by material expert

The material expert assessment instrument in the assessment of learning outcomes using the Computer Based Test (CBT) has 3 aspects, namely; material/content, construction, and language. The following table 4.1 validation results based on the assessment of material experts.

a) Material/content aspects

The maximum score for each instrument is 5. The total number of instruments in the validation of this material/content aspect is 5 instruments with the highest total score of 25.

Table 1. Validation results based on material/content aspects

No.	Description	Score
1	Instrument questions in accordance with the KD achieved	5
2	Instrument questions according to the indicators measured	5
3	The answer choices are homogeneous and logical	5
4	There is only one correct answer key	5
5	Questions according to the cognitive domain being measured	5
	Quantity	25
	Average score	5

Based on table 1, an assessment score of 25 is obtained, the results of the assessment based on the average score are 5. Regarding the five-scale score conversion formula, it is known that the average score (x) which is 5 lies in the range > 4.2 which states that the material/content aspect belongs to the category "Very good". So for the material/content aspect of the learning outcomes assessment instrument using the Computer Based Test (CBT) it is very good and appropriate.

b) Construction aspect

The maximum score for each instrument is 5. The total number of instruments in the validation of this material/content aspect is 7 instruments with the highest total score of 35.

Table 2 Validation results based on construction aspects

No.	Description	Score
1	The subject is formulated with clear questions	5
2	There are clear instructions on how to do question number	4

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3	The subject matter does not provide an answer key clue	5
4	The subject matter does not provide double negative questions	4
5	The length of the problem formulation is relatively the same	4
6	Answer choices using letters of the alphabet	4
7	The item does not depend on the answer to the previous question	5
	Jumlah	31
	Rerata skor	4,4

Based on table 2 obtained an assessment score with a total of 31, the results of the assessment based on the average score are 4.4. Regarding the five-scale score conversion formula, it is known that the average score (x) which is 4.4 lies in the range > 4.2 which states that the construction aspect is in the "Very Good" category. So for the construction aspect of the learning outcomes assessment instrument using the Computer Based Test (CBT) it is very good and appropriate.

c) Language aspect

The maximum score for each instrument is 5. The total number of instruments in the validation of this material/content aspect is 3 instruments with the highest total score of 15.

Table 3. Validation results based on language aspects

Based on table 3 obtained an assessment score with a total of 15, the results of the assessment based on the average score are 5. Regarding the five-scale score conversion formula, it is known that the average score (x) which is 5 lies in the range > 4.2 which states that the language aspect belongs to the category "Very Well". So for the language aspect of the learning outcomes assessment instrument using the Computer Based Test (CBT) it is very good and appropriate.

Data Analysis of Practicality of Learning Outcomes Assessment *Instruments using Computer Based Test* (CBT)

a) Analysis of teacher response questionnaire data

At the time of the trial, the assessment of learning outcomes using the Computer Based Test (CBT) was also given to the subject teachers. The teacher is an expert practitioner and the questionnaire is given in order to determine the teacher's response to the learning outcomes assessment instrument using the Computer Based Test (CBT) that has been developed. In this study, the researcher asked for a response to two teachers in charge of Information and Communication Technology (ICT), namely teacher A, a subject teacher and Teacher B, a teacher with the description of a technician and a proctor. The identities of the two teachers only researchers know. From the calculation results obtained data for each questionnaire as listed in table 10 below.

No.	Teacher		Amount	Average
	A	B		
1	4	5	9	4.5
2	4	5	9	4.5
3	5	5	10	5
4	5	5	10	5
5	5	5	10	5
6	5	5	10	5
7	4	4	8	4
8	4	4	8	4
9	5	5	10	5
10	4	4	8	4
11	4	5	9	4.5
12	4	4	8	4
13	5	5	10	5
14	5	5	10	5
15	5	4	9	4.5
16	5	5	10	5
17	5	5	10	5
18	5	4	9	4.5
19	4	5	9	4.5
20	4	5	9	4.5
Average				**4.625**

Table 4. The results of the practicality questionnaire data analysis by the teacher

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Based on table 4, an assessment score is obtained with a mean score (x) of 4.6. So the results of the assessment with a percentage interval of 4.6 are at > 4.2 with the "Very Good" category. In conclusion, the assessment of learning outcomes using the Computer Based Test (CBT) is very good and practical.

b) Analysis of student response questionnaire data

Student response questionnaires were given at the time after testing the assessment of learning outcomes using the Computer Based Test (CBT) was carried out. This assessment instrument is given to every student who has carried out a trial in order to find out the practicality by students of the learning outcome assessment instrument using the Computer Based Test (CBT) that has been developed. In this study, the researcher asked for a response to all students of class XII IPA with a total of 22 students and each aspect will be recapitulated as a whole to determine the practical aspects of the product developed, namely the instrument for assessing learning outcomes using the Computer Based Test (CBT).

No. Respondents	Average score of respondents	Remarks
1	4.2	Very good
2	4.4	Very good
3	4.3	Very good
4	4.5	Very good
5	4.5	Very good
6	4.3	Very good
7	4.5	Very good
8	4.5	Very good
9	4.6	Very good
10	4.7	Very good
11	4.5	Very good
12	4.7	Very good
13	4.7	Very good
14	4.6	Very good
15	4.6	Very good
16	4.8	Very good
17	4.5	Very good
18	4.4	Very good
19	4.6	Very good
20	4.6	Very good
21	4.9	Very good
22	4.7	Very good
Average	**4,5**	**Very good**

Based on table 4, the assessment score is obtained with a mean score (x) of 4.5. So the results of the assessment with a percentage interval of 4.5 are at > 4.2 with the "Very Good" category. In conclusion, the instrument for assessing learning outcomes using the Computer Based Test (CBT) is very good and practical.

Discussion

Overview of the Design of Learning Outcomes Assessment Instruments using Computer Based Test (CBT) at SMA Negeri 10 Sidrap

The learning outcome assessment instrument is an evaluation stage in the world of education to determine the learning outcomes taken by students. The assessment is also part of the minimum criteria for the existing education system throughout the territory of the Unitary State of the Republic of Indonesia, namely the Educational Assessment Standard. Along with the development of the world of technology, the wheel of life in the field of education continues to make improvements / improvements for the sake of the continuity of the advancement of science and technology (IPTEK).

In this regard, technological developments can be seen with a variety of functions and their respective benefits that make human resources more instant or efficient in carrying out their activities. In line with these developments, the industrial revolution 4.0, commonly called cyber physical systems, has made many changes in people's daily lives. As has happened in the education system in the Unitary State of the Republic of Indonesia, the contribution of

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this technological development has shifted. This influence may not dissolve if humans are able to know which side they want to take, especially teachers as educators or teachers in schools with the obligation to provide useful knowledge to their students. Talking about education will never end because it becomes the basis of the obligations of every human being, especially teachers must be required to improve competence in formulating assessment instruments so that if there is accountability, the results can be a concrete and real report.

Determination of assessment instruments or questions is not simply formulated, but there are rules or steps that must be understood to form the right formulation. Because, when the exam took place, there were student obstacles that appeared about mistakes in developing question instruments by the teacher and became doubts that the questions that were formulated were sometimes never studied during the learning process. As explained in the previous chapter, Uno (2008) stated that "the question does not necessarily match the indicators to be measured. Meanwhile, good questions are questions that have good quality. Questions are said to be of good quality if they measure what they want to measure and the questions must be in line with the learning objectives to be achieved. Based on this theory, the formulation of the questions must be in line with the learning objectives to be achieved so that students are able to know how to work on the instruments to be developed by the teacher.

Based on the Regulation of the Minister of Education and Culture Number 66 of 2013 concerning assessment standards, the assessment instrument must meet the requirements, namely: 1) a substance that represents the competence being assessed; 2) construction that meets the technical requirements according to the form of the instrument used; and 3) use of language that is good and correct and communicative according to the level of development of students. Seeing this basis, in formulating the instrument, the question must measure the competence that is assessed and have technicality according to the form of the instrument and in the use of communicative language that is easily understood by students according to their level. Because the use of language is a benchmark to find out the clarity of questions and answers so that students are able to answer the questions presented.

The presence of the Computer Based Test (CBT) is expected to facilitate all activities of education or staffing activities in schools and can reduce school budgets such as writing instruments for students' needs during written test exams. With this policy and the support of learning technologists, CBT applications can be recommended as an assessment of learning outcomes in every school. The learning outcome assessment instrument using CBT starts with an analysis of school needs. Observations have been made since October 2018, from the results of internal interviews that the learning outcome assessment instrument is still minimal and cannot be designed or formulated by the teacher so that the reinforcement in formulating questions and student learning outcomes is not in accordance with learning achievement. The use of CBT is expected to be able to provide experience to students during exams/tests and to increase moral confidence in answering the questions presented.

Until now, the use of CBT has been utilized by several schools that already have computer laboratories supported by computers/laptops provided by the school. Assessment of learning outcomes using the Computer Based Test (CBT) is an assessment method that can take the form of offline or online. The features that exist in CBT have been equipped with various features, such as: inputting student data, subject matter banks, arranging exam/test schedules according to the time of implementation, to recapitulating the final results of the assessment of learning outcomes.

Seeing the various features that have been equipped on CBT can make it easier for

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educators or education staff to streamline their workloads in determining student learning outcomes, and can also reduce school spending budgets. In addition, students do not tend to be bored facing exams/tests as an assessment of their learning outcomes because the paradigm of students is very enthusiastic if they can touch learning strategies with the integration of the use of technology such as CBT.

Validity, Practicality and Effectiveness of Learning Outcomes Assessment Instruments using Computer Based Test (CBT) at SMA Negeri 10 Sidrap

The instrument for assessing learning outcomes using the Computer Based Test (CBT) that has been developed meets the criteria for validity. The results of validation by material experts indicate that the assessment of learning outcomes based on aspects of language, construction, and language is included in the "**Very Good**" category, while the results of validation by media experts indicate that the use of Computer Based Test (CBT) is based on physical aspects, suitability of font type selection. , evaluation, display, and language are included in the "**Good**" category. From the results of the two validations, it is known that the average score (x) of 4.4 lies in the range > 4.2 which states that the validity of the learning outcomes assessment instrument uses the Computer Based Test (CBT) which states that the product developed is included in the "**Very Good**" category. ". Based on this, Arikunto (1999) suggests that a test/instrument is said to be valid if the test measures what it is intended to measure. The test has high validity if the results match the criteria, in the sense of having parallels between the test and the criteria. It can be concluded that the learning outcomes assessment instrument using the Computer Based Test (CBT) is declared valid.

The practicality of the resulting product is obtained from the results of the student and teacher response questionnaire analysis. The results of the assessment of student and teacher responses to the learning outcomes assessment instrument using the Computer Based Test (CBT) are "**Very Good**" for use. Based on the teacher's response, an assessment score was obtained with an average of 4.6. So the results of the assessment with a percentage interval of 4.6 are at > 4.2 with the "**Very Good**" category. And the results of student responses obtained an assessment score with a mean score (x) of 4.5. So the results of the assessment with a percentage interval of 4.5 are at > 4.2 with the "**Very Good**" category. Looking at the results of the presentation of the data, Arikunto (2010) suggests that practicality in educational evaluation is the easiness that exists in evaluation instruments both in preparing, using, interpreting/obtaining results, as well as convenience in storing them. It can be concluded that the learning outcomes assessment instrument using the Computer Based Test (CBT) is practical.

The effectiveness of the developed product is obtained from the results of student learning completeness. The results of students' mastery using the Computer Based Test (CBT), namely "Very Good". Completeness of student learning as many as 20 people with the total number of students is 22 people. The average value is 90.9. If the percentage of student completeness reaches 90.9 which is in the qualification > 80 then the effectiveness of the assessment of learning outcomes uses the Computer Based Test (CBT) with the "Very Good" category. Widoyoko (2016) states that calculating scores and determining each student's learning completeness is based on a minimum good criterion of 60. In relation to the effectiveness of developing instruments in the world of education, Akker (1999) states that "Effectiveness refers to the extent that the experiences and outcomes with the intervention are consistent with the intended aims". That is, effectiveness refers to the degree that the experience and outcomes of the intervention are consistent with the intended goals. It can be concluded that the learning outcomes assessment instrument

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using the Computer Based Test (CBT) is declared effective.

CONCLUSION

1. The development of dick & carey with ten steps on the assessment instrument using the Computer Based Test (CBT) is very suitable. It was obtained from the analysis of the early stages of the development model to the end, so that it was easy to provide an overview to educators in developing assessment instruments into computer-based exams. It should be noted that teachers still need skills in formulating assessment instruments or questions so that teacher performance competencies can have an impact on students as well as the nation's ideals in building a more advanced and characterized education.
2. The description of the design of the learning outcomes assessment instrument using the Computer Based Test (CBT) is expected to be able to build teacher competence in developing assessment instruments by understanding the steps or rules that are in accordance with the form of the instrument. So that the quality of the instrument is said to be good and correct if it goes through a process in accordance with applicable guidelines because there are still unscrupulous teachers who only make instruments without the initial process and any content in each formulating the items. And the current use of technology affects the field of education, especially when using computers so that assessment instruments can be integrated through Computer Based Tests (CBT) as learning innovations in the current generation era. Keep in mind that teachers must also be able to utilize computer technology in developing a set of tools as materials for learning media. In addition, the use of CBT can also minimize school budgets in terms of purchasing office stationery during exams, as well as feature support that can be offline without using/using an online network.
3. Assessment of learning outcomes using the Computer Based Test (CBT) that was developed meets the criteria based on the assessment of experts, namely material experts and media experts with the **"Very Good"** category, the practicality assessment is obtained based on the teacher and student response questionnaire with the **"Very Good"** criteria, while the assessment of effectiveness is obtained through the completeness of student learning outcomes with the category **"Very Good"**

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Author Profile

Akhmad Riandy Agusta, S.Pd., M.Pd, is a son born in Hulu Sungai Selatan, South Kalimantan Province on August 17, 1993. Born and raised in a regency far from the provincial capital, he has a relentless fighting spirit to achieve achievements. His fighting spirit led him to get the title of one of the best graduates of the undergraduate program at the Elementary School Teacher Education Study Program, Lambung Mangkurat University in 2015. The education process continued to the Masters level in the Postgraduate Basic Education Study Program, State University of Malang. Masters education was pursued with the Superior Scholarship offered by the Ministry of Education and Culture which led to him earning an M.Pd degree in 2017. After completing his master's program, in early 2018 he devoted himself to the campus of the Lambung Mangkurat University Elementary School Teacher Education Study Program, which is the campus where he studied. science at the undergraduate level. Until 2019, he was appointed as a Candidate for Civil Servant at the same campus. Until now he is in the field of expertise in Education. The subjects taught include Innovation and Development of Elementary School Programs, Classroom Action Research, Learning Models and Strategies, Learning Planning, Capita Selecta of Elementary School Learning, Introduction to Education and Learning and Learning. He is also involved in research on the development of learning models and strategies in elementary schools in an effort to develop 21st Century skills, the Industrial Revolution 4.0 and Society 5.0 for elementary school-aged children.

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