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Development of Cognitive Ability Test Instrument Based on Revision Bloom Taxonomy on Dynamic Electricity Materials For Students of Senior High School

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Abstract

This study aims to develop a cognitive ability test instrument based on Bloom's taxonomy revision. The test instrument covers the cognitive domains C1 (remembering), C2 (understanding), C3 (applying), C4 (analyzing), C5 (evaluating), and C6 (creating). The research was carried out using research and development methods using a 4-D development model (Define, Design, Develop, Disseminate). The research data obtained was analyzed quantitatively to determine the validity, discriminatory power, reliability, and level of difficulty of the cognitive ability test instrument. Results of research based on the analysis of the validity test showed that the test instrument was declared valid by material experts and evaluation experts with an average value of 92.65. Based on the analysis of the validity of the item validity test, there were two invalid questions, namely questions number 2 and 10. Based on the results of the analysis of discriminating power, question number 20 is rejected and has a biased meaning. Based on the result of the reliability analysis, the test instrument is reliable are a value of 0,87 for multiple choice and 0,64 for essay questions. Based on the analysis of the level of difficulty, the results showed that the test instrument was at 5% percent of the questions at the difficulty level, 20% at the sufficient level, 70% at the medium level, and 5% at the easy level. Overall, the test instrument is valid, reliable, has good discriminating power, and has varying levels of difficulty

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INTRODUCTION

Education is a planned activity intended to create an atmosphere and learning process so that students actively develop their potential (Triwiyanto, 2021). The teacher is responsible for preparing the material to be taught, choosing the methods and tools that will use in teaching, and making evaluation tools to find whether the lessons presented have succeeded in achieving the learning objectives (Safitri, 2019). Every teacher is accountable for their duties as an educator and requires an evaluation tool in the learning process (Ilmi et al., 2016).

Through the evaluation carried out by the teacher, the teacher can inform the learning outcomes possessed by the students (Pratama & Mulyati, 2020). With this information, the teacher can determine whether the goals have been set or achieved or not (Yusuf et al., n.d.). Learning evaluation can be feedback to these students to find the learning outcomes of the learning process that has been carried out (Mukarromah & Andriana, 2022). Knowledge and understanding of the achievement of student learning outcomes can help teachers reflect on how to improve their performance in the future and plan further learning (Kurniawan et al., 2018). Evaluation of learning outcomes can inform the quality of the methods, strategies, and learning media that have been carried out (Waizah & Herwani, 2021). Feedback from learning evaluation provides several functions as follows: (a) teachers and students know how much a learning objective or mastery of competence, and b) the teacher knows the effectiveness of the learning program implemented (Usop et al., 2022).

The requirements for teachers to be able to evaluate the results of student learning, include: (a) mastering and understanding the laws and regulations regarding the evaluation of learning outcomes; and (b) mastering learning evaluation theory (Waizah & Herwani, 2021). To evaluate teaching and learning outcomes, teachers can use two kinds of tests, namely standardized tests and teacher-made tests (Triwiyanto, 2021).

Evaluation of learning outcomes through written tests can reflect students' cognitive abilities. Cognitive abilities can improve students' thinking abilities (Najib et al., 2020). Benjamin S. Bloom suggested a good quality of education can apply all levels of the cognitive domain in every learning (Radmehr et al., 2018). The cognitive domains are behavior that focuses on intellectual aspects, such as knowledge, problem-solving skills, and thinking skills that include Lower Order Thinking Skills to Higher Order Thinking Skills (HOTS) (Suprapto et al., 2020). LOTS abilities include remembering (C1), understanding (C2), and applying (C3), while three aspects of higher-order thinking skills (HOTS) are the ability to analyze (C4), evaluate (C5), and create (C6). based toon Bloom's revised taxonomy (Waite et al., 2020).

An analysis of students' cognitive abilities is beneficial to know the achievement of learning outcomes and the level of achievement of students' cognitive ability (Nabilah et al., nd; Tanjung et al., 2019). Analysis of a cognitive ability expects to help teachers determine the level of cognitive ability of students' cognitive achievement (Sagala et al., 2019). Tests for students can measure students' cognitive ability. Test useful for obtaining information needed in the learning process (Afni et al., nd; Román-González et al., 2017).

Cognitive abilities of students in the learning process can be diagnosed from test instruments that cover abilities C1 to C6 (Yusuf & Widyaningsih, 2018). Based on observations of physics teachers at MAN 1 Semarang, it's shown that the teacher evaluation tool does not meet the criteria of validity, reliability, and discriminating power. The teacher cannot measure the ability of HOTS's skill because the test instrument is not tested first, so the conditions for validity, reliability and discriminating power were not found. The test instrument used was reviewed using a revised Bloom's taxonomy only in the ranges of C1 to C3. While questions at levels C1 to C3 are classified as Low Order of Thinking Skills (LOTS). The LOTS stage only explores students' abilities to remember, understand, and apply concepts. These are less relevant to apply to the 21st-century learning system (Takko et al., 2020).

Dynamic Electrical Materials are materials that are considered difficult by students (Hidayatulloh et al., 2019; Y. Kurniawan et al., 2018; Nofitasari et al., 2017). That is also experienced by students of class XII MAN 1 Semarang in the 2021/2022 academic year. Most of the students still have difficulty- calculating the resistance to substitute for parallel series circuits, understanding Kirchoff's laws, and understanding electrical energy and power. Students are also required to have cognitive competence up to C6, which is difficult for teachers to make test questions up to the cognitively level of C6, especially if the

questions are in the form of objective tests (multiple-choice) (Susiaty et al., 2018)

This study aims to develop a cognitive ability test instrument based on Bloom's taxonomy revision on Dynamic Electricity material for high school students. This study analyzed the quality of the test instrument through the analysis of validity, discriminating power, reliability, and the level of difficulty of the item.

METHODS

This type of research is research and development used a 4-D development model (Define, Design, Develop, Disseminate) (Winarni, 2018). The cognitive test instrument developed took Dynamic Electricity material based on Bloom's taxonomy revision for class XII students of MAN 1 Semarang regency by taking samples of students in class XII MIPA 1.

The research phase carried out in four stages as follows; 1). the define stages, namely by analyzing and reviewing competency standards, basic competencies, indicators, learning objectives, 2). The Design stage is to determine the method and format/type of the test instrument based on Bloom's taxonomy revision. The type of test is in the multiple-choice form with 15 questions and an Essay with five questions. The writing of the questions begins with compiling a grid of questions with indicators translated into questions according to the grid of questions that become the initial draft test instrument,3) The Develop Stage, which is reviewing test questions to correct deficiencies/ errors about questions. The expert/validator has reviewed the questions before being tested. This study uses one material expert validator and one expert evaluator to explore empirical data on the quality of the questions regarding validity, reliability, and distinguishing power became the basis for improving or revising the questions. Obtaining empirical data was carried out by testing the question instrument on students of class XII MIPA 3 MAN 1 Semarang with a total of 30 students. 4). The Disseminate stage is the use stage which developed on a wides scale, namely socializing the cognitive test instrument at the MGMP (Subject Teacher Consultation) forum at MAN 1 Semarang.

Expert validity, reliability, and discriminatory data indicate the validity of the cognitive test instrument. The research instrument used the item review format for the material of experts and evaluation experts. The item review format covers aspects of the material, construction, and the language used. The test instrument (initial draft) was validated by an expert validator, revised, then validated by practitioners before a limited trial. The validator's assessment of the learning outcomes test includes three aspects; material, construction, and language.

Each item of questions tested for validity. This analysis was done by correlating the score of each item with the total score achieved by the students. The questions tested for reliability were valid. Item reliability was analyzed using the K-R20 formula. The data from the validity, reliability, and discriminatory test results were processed using the Microsoft Excel 2019 program.

Expert validation performs an analysis by calculating the validity score from the expert validation results using the formula (Akbar, 2013)

$$Validity\ (V) = \frac{Total\ validation\ score\ 2\ validators}{max\ total\ score} x\ 100\% \quad (1)$$

The validation results matched with the validity criteria as shown in Table 1.

Table 1. Validity Criteria for learning tools

Scor	Criteria
85,01 – 100%	Valid
70,01 – 85,00%	Sufficiently Valid
50,01 – 70,00%	Less Valid
0,10 – 50,00%	Invalid

Sources: (Rusilowati, 2019; Suharsimi & Arikunto, 2012)

The validity of multiple-choice items tested using biserial point correlation (Cahyono, 2017) as follows;

$$r_{pbis} = \frac{M_p - M_t}{S_t}\sqrt{\frac{p}{q}} \quad (2)$$

In Equation 2 r_{pbis} shows the biserial point correlation coefficient. Mp is the average total score of who answers correctly on the questions. Mt is the average total. St is the standard definition of the total score. p is the proportion of students who answered correctly on each item. q is the proportion of students who answered incorrectly on each item. The calculated r-value is compared with the r table (r-point biserial) with a significance level of 5%. If r arithmetic > r table then it is said to be a valid question. (Akbar, 2013; Tyowati, 2018; Yusup Biology Tadris Study Program et al., 2018).

Test validity of essay items tested using product-moment correlation on Equation 3 (Fitria Alika et al., 2018; Suharsimi et al., 2012).

$$r = \frac{N\sum XY - (\sum X)(\sum XY)}{\sqrt{\{N\sum X^2 - (\sum X)^2\}\{N\sum Y^2 - (\sum Y)^2\}}} \quad (3)$$

The value of r is the correlation coefficient between variables X and Y, while N is the number of samples.

On the validity of the test, X is the value of the test questions developed, and Y is student test scores on different physics materials. On item validity, X is the score of item questions, and Y is the total score obtained by students in the test questions. The criteria for this correlation were categorized as follows. (Cahyono, 2017).

Table 2. Criteria for the validity of the test instrument

Score	Criteria
0,81 - 1,00	Very high
0.61 - 0.80	high
0.41 - 0.60	enough
0.21 - 0.40	Low
0.00 - 0.20	Very low

Sources: (Cahyono, 2017)

The differentiating power of the questions is analyzed based on equation (4). (Akbar, 2013; Cahyono, 2017; Mar'atus S et al., 2018)

$$DP = \frac{(WL - WH)}{n} \quad (4)$$

WL score is the number of students who answered correctly from the lower group. WH is the number of students who answered correctly from the upper group. n is 50% x the number of students. Distinguishing power is determined by the following criteria.

Table 3. Criteria for differentiating power of test instruments

score	Criteria
0,40 – 1,00	Question Accepted
0.30 - 0.40	Question Accepted but needs to be corrected
0.20 - 0.30	Question Corrected
0,00 - 0.20	Question Not used / discarded

Sources: (Rusilowati, 2019)

Reliability analysis of multiple-choice questions used the KR20 formula according to equation (5). (Cahyono, 2017)

$$KR20 = r_{11} = \left(\frac{k}{k-1}\right)\left(\frac{S_t^2 - \sum S_b^2}{S_t^2}\right) \quad (5)$$

The value of R_{11} or KR20 is the reliability of the instrument. K is for the number of questionnaire items. $\sum S_b^2$ is the number of item variants, and S_t^2 is the total variance.

In evaluation terms, the symbol for the difficulty index is P, an abbreviation of the word "Proportion." The magnitude of the difficulty index is between 0.00 to 1.0.(Asrul et al., 2014).

$$P = \frac{B}{JS} \quad (6)$$

P-value is the index difficulty. B is the number of students who answered correctly, and JS is the total number of test-takers. The difficulty index of the questions was classified as shown in Table 4.

Table 4. Criteria for Difficulty Level of Questions

Index	criteria
$0.00 \leq P \leq 0.30$	Difficult
$0.30 < P \leq 0.70$	Moderate
$0.70 < P \leq 1.00$	Easy

Sources: (Asrul et al., 2014)

RESULTS AND DISCUSSION

This study developed a cognitive test instrument that followed the procedure for developing a 4-D model device (define, design, develop, disseminate) with the following development stages:

1. The Define Stage

The Define stage begins with an analysis of Basic Competencies (KD) in the 2013 curriculum (Permendikbud No 37 of 2018 concerning Changes in Core Competencies and Basic Competencies of the 2013 Curriculum, n.d.), materials, cognitive aspects, and question indicators. Table 4 shows a grid of cognitive test instrument questions based on Bloom's taxonomy revision on Dynamic Electricity for high school students.

Table 5. Grid of Cognitive Tests Based on Bloom's Taxonomy Revised

Basic Competencies: 3.1 Analyzing the working principle of DC electrical equipment and its safety in everyday life.

Sub Material	Aspect Cognitive	Question Indicator	Question Number	Form Question
Measuring electric current and voltage	C2	Presented the results of ammeter measurements, the students can read the measurement results.	1	Multiple-choice
Ohm's Law	C4	A table of the results of measuring voltage and electric current is presented, and a statement based on the table is provided, a students choose the correct statement regarding Ohm's Law.	2	Multiple-choice
Ohm's Law	C3	Presented a circuit picture of a resistor connected to a voltage source, and students calculated the electric current that flows according to the concept of Ohm's law.	3	Multiple-choice
Ohm's Law	C6	Students design an experiment to prove the proportionality between electric voltage and electric current according to Ohm's law	16	Essay
shunt resistance	C3	It is known as the resistance in the ammeter, the maximum measuring limit of the ammeter, student can calculate the shunt resistance needed if the ammeter wants to increase its measuring limit.	4	Multiple-choice
front resistance	C3	Knowing the maximum measuring limit of the voltmeter and its internal resistance, students can calculate the front resistance that must be installed to increase a voltmeter's measuring limit.	17	Essay
Clamping Voltage	C4	Know the clamping voltage and current from the battery. The student calculates the magnitude of the emf and resistance in a battery.	18	Essay
Delivery barrier	C4	Provided a picture of a conductor having a length of L cut into five parts, students calculate the electrical resistance of the pieces of the conductor.	5	Multiple-choice
Delivery barrier	C4	Given a conductor with resistance R, length L, and cross-sectional area A, students can determine the ratio of two conducting wires whose length and area are different.	6	Multiple-choice
Delivery barrier	C3	It is known that the conductor has a certain resistance and size, students calculate the resistance of the type of conducting wire.	7	multiple-choice
Kirchoff's First Law	C3	Presented pictures of currents that enter and leave at the branching point, students can determine the amount of current flowing in one of the branches based on Kirchhoff's First Law.	8	Multiple-choice
Parallel series circuit	C3	Presented a picture of a series resistor circuit, students can calculate the resistance of a resistor series circuit substitute.	9	Multiple-choice
Parallel series circuit	C5	Presented a picture of a resistor circuit, students can conclude the value of the smallest replacement resistance	10	Multiple-choice
Mixed circuit	C4	Presented a picture of a mixed resistor circuit, and students can calculate the resistance of a mixe series circuit substitute.	19	Essay
Parallel series circuit application	C2	A series of parallel series lamps are present, and students can find out which are bright and dime if one of the lamps is taken.	11	Multiple-choice
Kirchhoff's Single Law Sequence	C3	Presented with a single electric circuit, students calculate the electric currents flowing in the electric circuits according to Kirchoff's Law.	12	Multiple-choice
Multiple Kirchhoff's Law Circuits	C4	Presented with a compound electrical circuit, students calculate the electric currents flowing in one of the branches.	20	Essay
Electrical power	C2	Students choose the correct statement from a lamp specification.	13	Multiple-choice
Electrical power	C6	Students can design electrical circuits and the number of lighting needs.	14	Multiple-choice
Electrical energy	C1	Students can state the basis for paying electricity bills	15	Multiple-choice

Based on Table 5, develop 20 questions consisting of 15 PG and five essay questions with distributions of C1 to C6 evenly. The distributions of questions based on cognitive aspects can show in Figure 1.

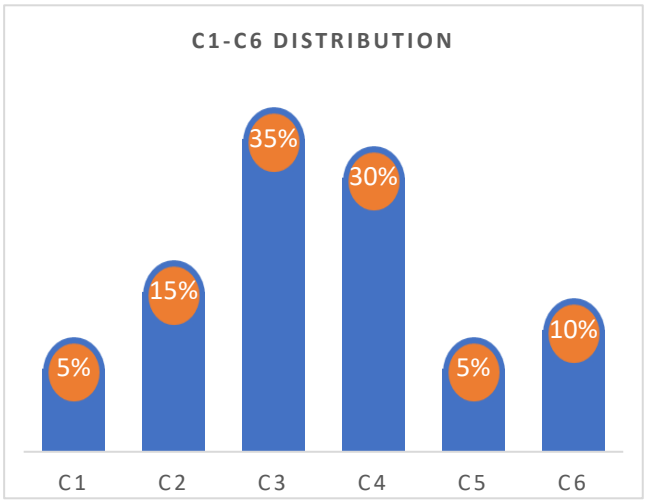

Figure 1. The distribution of question based on cognitive aspects C1 to C6

Figure 1 informs that; the cognitive ability test instrument in this study consisted of questions at levels C1 to C6. Based on cognitive levels C1 to C6, the percentage of the number of questions is C3, and the lowest is C1 and C5. The distribution is 5% on C1, 15% on C2, 35% on C3, 30% on C4, 5% on C5, and 10% on C6.

Several studies have developed test instruments based on conceptual knowledge dimensions from the revised Blom taxonomy, with most of the instrument development in the form of multiple-choice (Susiaty & Oktaviana, 2018; Tanjung et al., 2019). Multiple-choice questions have advantages and disadvantages. The advantages of multiple-choice include; 1) Reaching more materials/competencies to be measured. 2). More efficient in assessing, 3) Covering a wide range of materials. 4) Covers almost all competencies. 5) Easy to analyze the questions with the software of certain. 6) Only one correct answer. 7) It is easier for students to work on, and solving problems is simpler (Asrul et al., 2014). In this study, the researchers tried to reduce the shortage of multiple-choice questions, namely: subjective (students answer guesswork), cannot know the process/steps of students in solving questions, allow speculative answers (Shakhman & Barak, 2019). This study developed an instrument in multiple-choice, and essay to measure the cognitive ability of students based on the revised Bloom's taxonomy on dynamic electricity material for high school students based on several research results (B. R. Kurniawan et al., 2018; Tanjung et al., 2019) and the advantages and disadvantages multiple-choice questions.

2. The Design Stage

The design stage is carried out by examining the questions that have been prepared with the goal of correct questions that still have shortcomings/errors. The question study was carried out by one material expert validator and one education expert in the field of evaluation. Analyzed of the validity of the questions was carried out based on the results of the validator's assessment of educational evaluation experts and content/material experts based on aspects of the material, construction, and language (Rusilowati et al., 2019; Suharsimi et al., 2012).

Table 6 shows the results of the assessment of the material expert and evaluation expert on the validator. Cognitive ability test instruments by material experts Dynamic Electricity and evaluation experts have an average material content score of 92 (valid), an average construction content of 93 (valid), an average language content of 93 (valid), and an average total score of 92 .65 (valid).

Table 6. Results of Expert Assessment of Cognitive Ability Instruments

Validator	Material	Construction	Language	Average
Material Expert	92	93	94	93.0
Evaluation Expert	92	93	92	92.3
Average	92	93	93	92.65
Criteria	Valid	Valid	Valid	Valid

The validator, the Dynamic Electrical material expert, and the evaluation expert corrected several questions on the test instrument. These improvements are examples in Table 7.

Table 7. Editing questions from expert validators

Before	The electricity bill is calculated from…. a. usage time b. the obstacle c. electric current d. the energy e. power
After	We currently cannot be separated from the need for electrical energy. However, in using it, we have to be frugal by turning off unused household appliances. Savings certainly have an impact on reducing electricity bill bills. The electricity bill can be calculated from…. a. usage time b. the obstacle c. electric current d. the energy e. power

Table 8 shows that question number 15 initially did not have a question stimulus, and the grammar was not good. The stimulus can train students' literacy and critical thinking skills (Fitria Alika et al., 2018). Writing instrument questions for Development of Cognitive Ability Test Instruments Based on Revised Bloom's Taxonomy on Dynamic Electrical Materials for High School Students must pay attention to the rules of writing multiple-choice questions and essays (Pakpahan, 2021).

3. The Development Stage

At the stage of developing the cognitive ability test instrument based on Bloom's taxonomy revision on the Dynamic Electricity material, it was tested on 30 students of class XII MIPA MAN 1 Semarang. The trial results data were analyzed based on validity, discriminatory power, reliability, and level of difficulty (Sailer et al., 2021; Winarni, 2018).

Item Validity

The validity value shows the validity of a test instrument and can measure the ability of students based on instrument indicators (Sagala & Andriani, 2019). The test has high validity if the results match the criteria, in the sense of having parallels between the test and the category (Suharsimi & Arikunto, 2012). Table 8 shows the validity of the items with a limited trial at MAN 1 Semarang with a sample of 30 students of class XII MIPA.

Table 8. Item Validity

Multiple-choice questions			Essay questions		
Question Item	validity	category	Question Item	validity	category
1	0.519	Valid	**16**	0,636	Valid
2	0.362	Invalid	**17**	0,668	Valid
3	0.581	Valid	**18**	0,639	Valid
4	0.660	Valid	**19**	0,684	Valid
5	0.765	Valid	**20**	0,600	Valid
6	0.490	Valid			
7	0.623	Valid			
8	0.553	Valid			
9	0.765	Valid			
10	0.286	Invalid			
11	0.563	Valid			
12	0.705	Valid			
13	0.481	Valid			
14	0.708	Valid			
15	0.510	Valid			

Based on the test of the validity of the essay questions, all questions in the high category reflect that essay questions can measure cognitive abilities based on Bloom's taxonomy revision (Lia et al., 2020). Multiple choice questions numbers 1,3,4,5,6,7,8,9,11,12,13,14, and 15 are valid so they can also be used to measure students' cognitive abilities. Questions numbers 2 and 10 are invalid, so the questions cannot measure the cognitive abilities of students (Dewi et al., 2019). Problem number 2 is not able to measure the ability of students to choose the correct statement related to Ohm's Law. Question number 10 cannot measure the cognitive ability of students in concluding the smallest resistor resistance.

Discriminating Power

The calculation of the discriminatory power of questions is a measurement of the extent to which a question can distinguish students who already understand the material well from students who still do not or lack mastery of the material (Sagala et al., 2019). Based on the testing of the test instrument for the differentiating power of the questions, it can be shown in table 9.

Table 9. Differential Power of Questions

Category of Distinguishing Questions	Item Number	Amount
Received	1,3,4,5,6,7,8,9,11,12,14	11
Received with improvements	2,15,16,17,18,19	6
Fixed	10,13	2
Rejected	20	1

Based on Table 9 shows that 11 questions can be accepted, 6 questions are accepted with slight improvements, 2 questions need to be corrected as a whole and 1 question is rejected because the difference in power value is very low, namely $0.00 < D < 0.20$ (Rusilowati et al., 2019). This means that item number 20 has a biased meaning. In general, it can be stated that the test's overall cognitive ability does not have biased items. The question stated not biased if the question does not make one individual is more advantageous (Handayani et al., 2020)

Reliability

The test reliability coefficient is said to be reliable if the coefficient Suharsimi et al., 2012). Based on the calculation of the instrument being tested, the reliability value for multiple-choice questions is 0.87, so it is said to be a reliable instrument.

Analysis of the reliability of the essay question instrument using the alpha formula. The essay test instrument is reliable if the r-value > 0.36

(Rusilowati & Astuti, 2019; Suprapto et al., 2020). analysis of the results obtained a reliable coefficient value for essay questions of 0.64. Through the analysis of the reliability of multiple-choice questions and essays, the test instrument developed can be said to be stable, namely: the test results are fixed if used to measure cognitive abilities in different students (Roldán-Merino et al., 2019).

Difficulty Level

A good question is a question that is neither too easy nor too difficult. Numbers that indicate the difficulty and ease of questions are called the difficulty index (Shakhman et al., 2019).

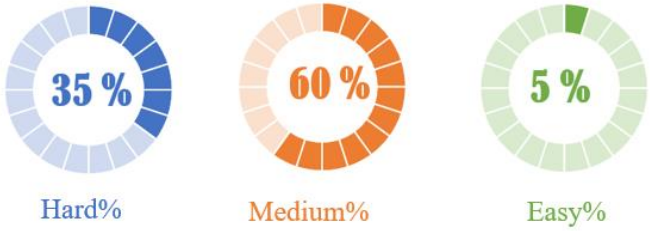

Figure 2. Distribution of Problem Difficulty Level

Figure 2 shows that students of class XII MIPA MAN 1 Semarang consider 35% of the questions in the difficult level, 60% in the medium level, and 5% in the easy level. The results of the analysis of the level of difficulty indicate that the cognitive ability test instrument is close to the ideal distribution, namely 25% difficult, 50% moderate, and 25% easy (Ilmi et al., 2016)

The item difficulty level has two uses, for teachers and testing and teaching. Its use for teachers is: (1) as an emphasis on the concepts of re-learning and providing input to students about their learning outcomes, and (2) obtaining information about curriculum emphasis or suspecting biased items. Its uses for testing and teaching are: (1) emphasizing the concepts needed to be re-teacher, (2) knowing the strengths and weaknesses of the school curriculum, (3) providing input to students, (4) knowing the possibility of biased items, (5) assemble a test that has the accuracy of the question data (Rusilowati et al., 2019).

The analysis of the difficulty level of the research questions has several limitations, including it is hard to estimate the Average Difficulty Level (TK) correctly. The sample or test taker will bias the results of the estimated level of test difficulty. The questions will be easy for students with high abilities (TK 0.90). The questions will be difficult for low-ability students (TK 0.30) (Shakhman & Barak, 2019).

4. The Disseminate Stage

The dissemination stage consists of three activities, validation testing, packaging, diffusion, and adoption (Thiagarajan et al., 1974). The revised product at the validation testing stage was then implemented in Physics learning on Dynamic Electricity material for SMA/MA class XII at MAN 1 Semarang. Implementation aim to measure the achievement of the objectives of the cognitive ability test instrument. The measurement aims to determine the effectiveness of the cognitive test instrument based on the revised Bloom's Taxonomy. (Winarni, 2018). The next stage is to package the cognitive ability test instrument using the quizizz application and substitute it in the Dynamic Electricity learning module. At the adaptation stage, use a cognitive test instrument in class XII physics learning at the SMA/MA level.

CONCLUSION

The question instrument has been declared valid by material experts and evaluation experts to an average value of 92.65. The analysis of validity, discriminating power, reliability, and difficulties level concluded that the cognitive skill test instrument based on Bloom's taxonomy revision on physics subjects for high school Dynamic Electricity material was declared valid and eligible. Based on the analysis of the validity of the items, questions no. 2 and 10 are not eligible to use. Based on the analysis of differentiating power, question number 20 is not eligible to use. Thus, the instrument will be

valid and eligible by eliminating questions number; 2, 10, and 20.

The results showed that the instruments in this study stated to be reliable in the number of 0.87 for multiple choice questions and 0.64 for essay questions. The level of difficulties is at 5% percent on the difficulty level, 20% on the sufficient level, 70% on the medium level, and 5% on the easy level. Overall, the test instrument is valid, reliable, have different power, and has varied the difficulty level.

This research hopes that it can provide a reference for cognitive ability test instruments based on Bloom's Taxonomy revision on Dynamic Electricity material. The resulting instruments can measure cognitive abilities for all aspects of C1 to C6 with a balanced composition. Evaluation with cognitive ability test instruments is expected to increase, and students become accustomed to critical thinking.

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