

DEVELOPMENT OF MULTIPLE-CHOICE QUESTION INSTRUMENTS BASED ON GOOGLE FORM ON ENVIRONMENTAL POLLUTION MATERIALS FOR CLASS VII JUNIOR HIGH SCHOOL

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Abstract

This research is included in development research with the objectives of this study (1) to describe the process of developing a google form-based question instrument at each ADDIE stage, and (2) to describe the product developed after the validation process. This study used the ADDIE development model, with stages of Analyze, Design, Development, Implementation, and Evaluation. Data were obtained from; (1) descriptive data on the process of developing a google form-based question instrument and (2) quantitative data from the validation results from the validator and empirical test results in the form of item validity, reliability, level of difficulty, discriminating power, and distractors. The result showed that there were 7 out of 10 questions that were declared valid, the reliability value was 0.740 with a high level of reliability, the discriminatory power showed that there were 8 questions that were said to be good, 1 question was accepted and had to be revised and 1 question was rejected, from 10 questions there were 6 questions that were declared easy and 4 while, there were 11 out of 40 answer options which were declared not to function as distractors.

Keywords: question instrument, google form, water pollution

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INTRODUCTION

The existence of the coronavirus in the world, especially in Indonesia, has had major impacts on people's lives, ranging from health, social, economic, and even education. The big impact that occurred in the world of education due to the coronavirus outbreak was that school activities underwent a change from face-to-face to school from home (online), this was done as an effort to prevent the spread of COVID-19 (Nurdin & Anhusadar, 2021:687). One of the school activities in the teaching and learning process that has changed is the assessment process or what is commonly called evaluation. Implementation of learning assessment/evaluation needs to be done to help students and teachers know the level of success and achievements that have been achieved by students when receiving learning from school.

Evaluation is one of the factors in learning that can develop student potential, Aripin (2018:27) states that to determine the success of the learning process and also the continuity of the subsequent learning process, an evaluation of learning in education is very much needed. Conventionally, the evaluation of learning is carried out in a written test, with a device consisting of a question sheet and an answer sheet. After that, the teacher must check each answer sheet to find out the results of the evaluation of the learning process. Of course, this takes a lot of time and energy. So that there is a need for innovation as stated by Kurniawan, (2019) in Prayitno & Mardianto (2020: 172) that innovation in PMB that can be done by a teacher is one of them being able to utilize technology in learning. The development of increasingly sophisticated technology has produced several media/applications that can help educators evaluate student learning outcomes, especially during the current corona outbreak. One application that can help educators evaluate student learning outcomes is the Google Forms application.

Google forms are the application of choice used in this study because according to Utomo et al (2021) Google forms have various choice features so that they can provide various types of questions and have a simple appearance so that users can easily access and design different questions with Kahoot which have complexity in when designing questions that not all teachers are updated with technology. Besides that, one of the benefits of Google Forms is that it can directly find out the scores obtained by students. This is the opinion of Hesti, (2015: 29) who states that a good test is characterized by the efficiency of the time used during tests, scoring, and administration. Evaluation of science subjects using google form media has been done before, namely by Kuswanti & Fitriyah (2022) in their research on the google form-based global warming material from 10 questions developed only 1 valid question while the research of Kuswanti and Wahidah (2022) in their

research on the google form-based respiratory system material from the 20 questions developed there are 10 valid questions, from the results of previous research it can be concluded that different materials produce different values so that researchers try to conduct further research with different materials, namely environmental pollution materials using the google form application. The questions that will be used in this study are in the form of multiple-choice questions (Multiple Choice) because multiple-choice questions can be assessed more objectively. Based on the results of the studies that have been carried out, several opinions state the objectivity of a multiple-choice test, including (1) Widoyoko 2014 (Hesti, 2015:15) states that one of the advantages of multiple-choice tests is that the scoring of the test can be done objectively and easy to correct. (2) According to Dwi, (2014: 40) said that the multiple-choice test has provided an answer key that cannot be changed so that the multiple-choice test is considered capable of avoiding teacher subjectivity in the scoring process. The questions used in this study amounted to 10 questions.

In everyday life, humans need water for drinking, eating, washing, and others, because water is one of the sources of human life. If the water consumed by humans is dirty, then our bodies will feel the consequences of the dirty water which is certainly very dangerous. Therefore, as humans, we need to know and learn about the impacts and causes of water pollution so that we can be more careful or prevent water pollution and we can learn to protect the environment around us. The selection of water pollution material is deemed appropriate to the learning objectives in this study and the school has never conducted a test using google forms with this material.

RESEARCH METHODS

This research is a type of development research. The resulting product is a google form-based question instrument with environmental pollution material for class VII SMP/MTs students. This study uses the ADDIE development model, which consists of five stages, namely;

1. Analyze = Conduct curriculum analysis, material analysis, and analysis of student needs
2. Design = Designing question grids and designing google forms
3. Development = Guiding the first draft of the question instrument development starting with making learning achievement indicators and question indicators in the form of multiple-choice with a total of 10 questions, resulting in the second draft developing the question instrument starting with making questions using google forms which were then validated by expert lecturers and produced draft III development of question instruments that have been revised several times and produce question instruments that can be implemented to students.
4. Implementation = After making revisions many times, then a trial was carried out on 15 students of class VII SMP.
5. Evaluation = Conducting evaluation at each stage of ADDIE.

The instruments used to collect data are (1) a question grid with the material of Water Environment pollution, and (2) a question instrument validation sheet. The multiple-choice instrument that was developed was tested on 15 seventh-grade students of SMP Al-Falah with the form of the questions developed in the form of multiple-choice test questions with a score of 1 in the correct category and 0 in the wrong category. The data analysis technique used in this study is theoretical validity and empirical validity. Theoretical validity was obtained from the analysis of the assessment of material aspects, construction aspects, display aspects and google forms aspects which were reviewed by 2 expert lecturers and 1 science teacher. Meanwhile, empirical validity was obtained by calculating validity, reliability, level of difficulty, discriminating power test, and distractor test.

RESULTS AND DISCUSSION

This research produces a product in the form of questions based on google forms with environmental pollution material. This question contains material about water pollution, which consists of 10 multiple-choice questions. According Solichin, (2017: 195) said that the characteristics of a good instrument are instruments that meet the requirements of validity and reliability. So that in this study it is necessary to explain the results of the products that have been developed by the validity, reliability, level of difficulty, distinguishing power, and distracting questions.

Validity

The question instrument is done by measuring each item developed. The results of the instrument validation are presented in Figure 1 below.

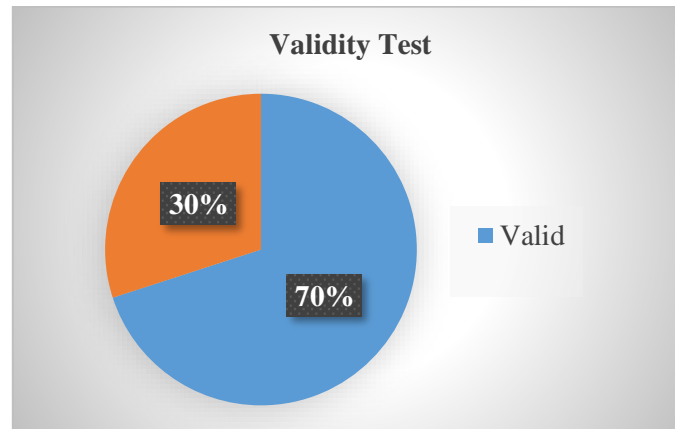


Figure 1. Results of Validation of Question Instruments based on Google Forms

Figure 1 shows that of the 10 items 3 questions are declared invalid and 7 questions are declared valid because they have met the criteria for the validity of the items that have been determined.

Reliability

According to Suharsimi Arikunto (in Irmaya), 2020:109 said that the reliability of the test aims to assess the accuracy of the test if the test is tested on the same subject. Based on the research that has been done, the results obtained are 0.740 with the criteria of "High Reliable Level" this shows that the reliability value in this study does not need to be revised according to what Yusup said, (2018: 22) stating that if the Cronbach's alpha value is less than 0.70 according to Tavakol & Dennick 2011 in Yusup (2018:22) suggests revising items with low correlations.

Question Difficulty Level

Item difficulty level The difficulty level of a question can be said to be good if the question is not too easy and not too difficult, the following criteria for the difficulty level according to Solichin, 2017:196 are if the results of the difficulty level obtained have a score of 0.00-0.30 then it is said to be "Difficult" if the results obtained are 0.31-0.71 then it is said to be "Medium" while if the results are obtained with a score of 0.71-0.100 then it is said to be "Easy". The results of the difficulty level of the questions can be seen in Figure 2.

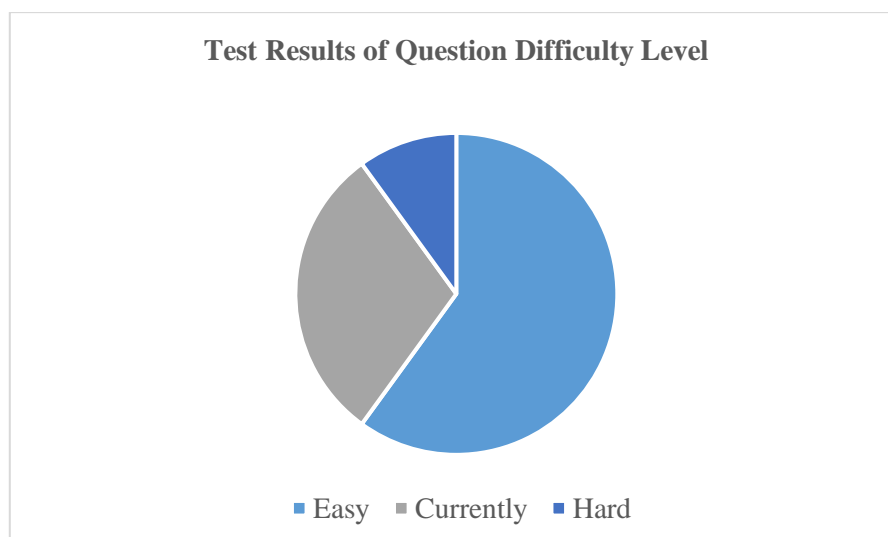


Figure 2. Test Results of Question Difficulty Level

From Figure 2 it is known that from 10 questions 6 questions have an easy question category, 3 questions are categorized as medium and 1 question is categorized as difficult.

Power of Difference

Distinguishing power according to Solichin, 2017: 197 states that the discriminatory power of questions is the ability of a question to distinguish the ability of students who think at higher levels from students who think at lower levels. The results of the different power tests on the items can be seen in table 3

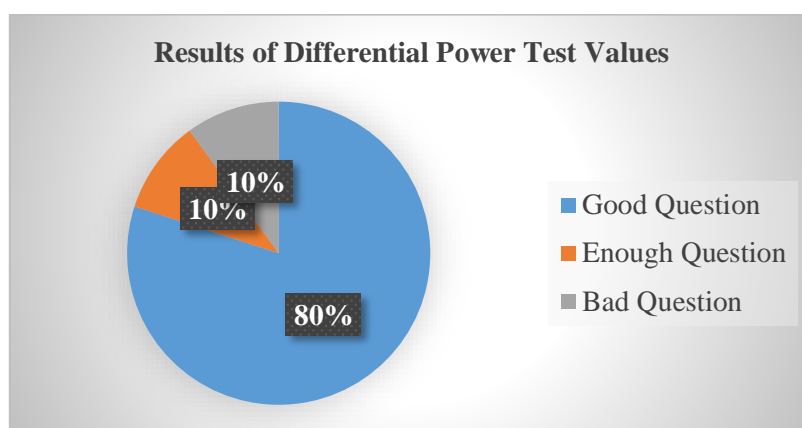


Figure 3. Results of Differential Power Test Values

The results of the discriminatory test showed that the items with the category of "rejected questions" (question number 8) amounted to 1, questions with the "corrected" category (question number 6) amounted to 1, and questions with the category "good questions" (questions number 1, 2, 3, 4, 5, 7, 9, and 10) total 8.

Distractor Test

Distractors are said to function properly if at least 5% of the test takers are selected (Solichin, 2017:199).

Table 1. Distractor Test Results

Question	Description									
	1	2	3	4	5	6	7	8	9	10
A	Good	Good	Good	Good	Good	Good	Good	False	Good	Good
B	Good	False	Good	Good	Good	Good	False	Good	Good	Good
C	Good	Good	Good	Good	False	False	Good	Good	Good	Good
D	False	Good	False	False	Good	Good	False	False	False	Good

The results of the distractor test conducted in this study indicate that: There are "functioning" and "false" criteria in the answer options that have been made by the researcher. These criteria can be identified by calculating each answer option divided by the number of respondents and multiplied by 100%. The answer option declared to work has a greater value of 5%.

CONCLUSIONS AND SUGGESTIONS

A. Conclusion

1. The question instrument in this study refers to the ADDIE development model which has five stages: Analysis, Design, Development, Implementation, and Evaluation.
2. The google form-based question instrument is declared valid based on the validity test with valid results for as many as 7 items out of 10 existing questions while the other 3 questions are declared invalid, the reliability test obtained is 0.740 with a reliable level of "High", the level of difficulty of the questions of

10 items, 6 questions stated "Easy" and 3 questions stated "medium" and 1 item was declared difficult, the power test obtained results 8 items were said to be good, 1 item was sufficient and 1 item was different, while for the distractor test the results were in the options In the answers to the 10 questions, several answer options were found which indicated that these options did not work.

B. Suggestion

Based on the conclusions above, the researchers provide some suggestions as follows:

1. Suggestions for Utilization: The google form-based question instrument on water pollution material can be put to good use in schools.
2. Advanced Product Development Suggestions: The development of the google form-based question instrument that has been developed can be further developed in the future so that the scientific material that can be developed is not only water pollution material.

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