

Development of Performance Assessment Instrument Based on Discovery Learning In Fourth Grade Elementary School

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Abstract:

The purpose of this study is to develop and describe a performance assessment instrument based on discovery learning which is valid and reliable in assessing student performance in fourth grade elementary school. This research and development refers to Borg and Gall theory. The study population was fourth-grade teachers in the Elementary School in the Gading Rejo District, and the subject was determined by a simple random sampling of 19 teachers who are included in the Cluster III of Gading Rejo and Cluster V of Gading Rejo. Data were collected through observation sheets and questionnaires. The data analysis technique used validity and reliability. The performance assessment instrument developed is in the form of a check list which is used to measure students' skills in receiving stimulation, identifying problems, collecting data, processing data, proving data and drawing conclusions. Each point of assessment in the performance assessment instrument is validated by evaluation experts, material experts, linguists, and 4th grade elementary school teachers as user tests. The results showed that all assessment items in the performance assessment instrument developed valid and reliable.

Key Word: *instrument, performance assessment, discovery learning*

Date of Submission: 24-09-2020

Date of Acceptance: 07-10-2020

I. Introduction

Education is one important aspect that can help students develop their potential. To meet current educational needs, there is a need for improvements in the learning process. The learning process that takes place will never be separated from the assessment process. Assessment is based on learning objectives which have success criteria to determine the extent of changes that have occurred in students through teaching and learning activities.

The ideal assessment of a learning is an assessment that includes the cognitive (knowledge), affective (attitude), and psychomotor (skills) domains. This is in accordance with Permendikbud No. 53 of 2015 which states that data collection on the development of competence of students in learning is carried out in the aspects of attitudes, knowledge, and skills. One of the authentic assessments that contributes to the implementation of classroom learning assessments is performance assessment or what is known as performance assessment.

Richard Sittings in Ataç (2012: 10) says that performance assessments call upon the examinee to demonstrate specific skills and competencies, that is, to apply the skills and knowledge they have mastered. In line with this, Zulkifli (2016: 65) defines performance assessments as an assessment of several activities in which students perform to demonstrate, complete, or perform actual interest behaviors.

Based on the results of the interviews conducted, it can be concluded that the teacher has not fully used performance appraisal in learning. The teacher only uses the assessment instrument found in the teacher's book, but the teacher himself still doesn't understand how to use it because the instructions for use are not clear. The teacher's lack of understanding regarding skills assessment causes teachers to assess skills based on students' cognitive abilities, not based on skills assessment results. Of course this is not in accordance with the standard of assessment as stated in Permendikbud no 23 of 2016, especially on the principle of objectivity.

The benefits of doing a performance assessment were shown by Marhaeni et al. (2019:9) in their research which stated that performance assessment had an effect on student ownership of learning and writing competencies. Rufina C. Rosaroso and Nelson A. Rosaroso (2015: 76) in their research show that students are highly motivated to learn when lessons are integrated with performance-based tasks. Students become independent because they can work individually or in groups.

In teaching learning concepts in elementary school, the main key to teaching success lies not in how much material is provided but in skills development. One of the learning models that can be used is Discovery Learning. Hanafiah and Suhana (2010: 77) stated that discovery is a series of learning activities that maximally involves students' ability to seek and investigate in order to find their own knowledge, attitudes, and skills. Hosnan (2014: 282) states that discovery learning is a model for developing student learning to actively discover for themselves, investigate for themselves, so that the results obtained will last a long time in memory and will not be easily forgotten by students.

Based on the explanation above, product development was carried out in the form of a performance assessment instrument based on discovery learning in 4th grade elementary schools.

II. Methods

Method of the research that used in this study is research and development. The steps of the Research and Development (R & D) method refer to the five steps of the ten steps of Borg and Gall (1989: 784), that are 1) research information gathering, 2) planning, 3) initial product form development, 4) stage testing initial, and 5) product revision.

The population in this study were all teachers in Gading Rejo district. In this study, the sampling technique used was cluster random sampling technique. The selected sample was 4th grade teacher elementary school teachers who included in cluster III of Gading Rejo and cluster V of Gading Rejo. The sampling technique used in this study was simple random sampling technique. The research instruments used were questionnaires. The questionnaire was used to obtain data about the validity and reliability of the instrument. Validation tests conducted by material expert lecturers, evaluation experts, and linguists. Instrument validation uses the product moment formula with the formula

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

Information:

N = Correlation coefficient between item scores and total score

X = Item score

Y = total score

r_{xy} = The correlation coefficient between variable X and variable Y

The criteria test is if $r_{count} > r_{table}$ with $\alpha = 0.05$ then the measuring instrument is declared valid, otherwise if $r_{count} < r_{table}$ then the measuring instrument is declared invalid. The performance assessment instrument reliability test was conducted using the Cronbach Alpha method. To interpret the value of reliability with a correlation index using criteria:

Table 1. List of Interpretation "r" Coefficient

Coefficient r	Reliability
0,80 – 1,00	Very Strong
0,60 – 0,79	Strong
0,40 – 0,59	Moderate
0,20 – 0,39	Low
0,00 – 0,19	Very Low

Source: Sugiyono (2009: 257).

The level of reliability is indicated by a number called the reliability coefficient value. High reliability is indicated by a value close to number 1. Reliability is considered satisfactory if ≥ 0.60 .

III. Result

Research Results

The result of the research and development is a product performance assessment instrument based on Discovery Learning- on learning theme 4 "Selalu Berhemat Energi", sub-theme 3 "Energi Alternatif" in grade 4th Elementary School.

The initial stage of the research was carried out by collecting data in the form of interviews and questionnaires for teachers of Elementary School. Data obtained that most teachers have not used performance assessment for classroom learning assessment, the assessment instrument used does not include clear instructions for them. The teacher has never developed a performance assessment instrument, the teacher

has only used an assessment instrument from the teacher's book, the teacher says it is necessary to conduct a performance assessment, and there is a need to develop a performance assessment instrument.

Based on the results of the preliminary research, the researchers concluded that it is necessary to develop performance assessment instrument based of discovery learning so that the development of this assessment instrument can be an alternative assessment instrument used to assess the skills of students.

Planning

The results of the planning stage that has been carried out by researchers are the preparation of an instrument framework, preparation of an assessment rubric, preparation of assessment instruments, assessment of development instruments.

Development of a performance assessment instrument

The development of the initial product format was carried out in accordance with the prepared instrument framework.

Product Trial

Initial product trials were conducted to test the validity of the evaluation, material, and language aspects. Product validation tests were carried out using questionnaires by material experts, media experts, and linguists, as well as teachers. The evaluation validation got a score of 77 which is included in the good category. Material validation got 81.25 points with the very good category. Language validation has a value of 100 in the very good category and validation by field practitioners, namely grade IV teachers, has a valid category for every aspect. The validator also provides suggestions and input on discovery learning-based performance assessment instrument products.

Product Revisions

Based on the advice of the validator, the researcher refined the performance assessment instrument according to the suggestions that had been given. Based on the advice of the linguist, several revisions were made, namely improving word choice, sentence structure and sentence effectiveness and the use of punctuation marks. Based on the recommendation of the material expert, several revisions were made, namely improving the mapping of core competencies and basic competencies, changing the word in the title, fixing tables and figures. On the advice of the evaluation expert, several revisions were made, namely add an introduction to the instrument, add a table of contents, and correct the sentence in the usage guidelines.

IV. Discussion

1. Development of performance assessment instrument based on Discovery Learning

Development of performance assessment instrument based on discovery learning adapts five steps of ten steps R & D by Borg & Gall (1983: 781), with the following steps: 1) Initial information gathering 2) Planning 3) Product development 4) Material expert testing, 5) Revision initial product. The R & D research steps used in this study were completed in the fifth stage, namely revising the initial product based on the results of field trials through expert and practitioner validation tests. This is due to time and cost limitations and is adjusted to the current situation and conditions that make it impossible to carry out tests on a large scale due to the application of social distancing. Based on these reasons, the researcher adjusted it to the actual research objectives and conditions.

The first stage is research and preliminary information gathering. The preliminary study in this research was conducted by observing, interviewing, and distributing a google form assisted questionnaire to 19 grade 4th teachers at public elementary schools who were members of the cluster III Gading Rejo and cluster V Gading Rejo. A preliminary study was conducted to examine the assessment tools used by teachers. Then an interview was conducted to find out how the teachers carried out the learning so far, whether the educator had done itconduct performance appraisals in learning. After researchersknowing the problems that occur, the researcher plans to develop a performance assessment instrument that will be used by educators as an alternative to learning assessment of students. Furthermore, the researcher arranges the initial product development of the performance assessment instrument, in this step the researcher sets out the development pattern that will be carried out in the performance assessment instrument based on discovery learning.

Performance assessment instrument based on discovery learning are structured into 6 lessons where each learning consists of several interrelated subjects. The development of discovery learning based performance assessment instruments consists of several parts, are: (a) Cover, (b) Foreword, (c) Table of contents,(d) Instructions for use,(e) Mapping learning,(f) learning materials,(g) Performance assessment tasks, (h) Process assessment instruments, and (i) Process scoring rubric.

Furthermore, the resulting instrument was tested on the validator through expert validation and limited trials with the teacher to find out whether the instrument made was valid and reliable. According to Fraenkel,

Wallen, and Hyun's opinion in Yusup (2018: 18), the instrument is declared valid depending on the expert. Experts are free to give an assessment whether this instrument is valid or not.

In general, the results of the validation by evaluation experts, linguists, material experts, and practitioners stated that the instrument was good. This development product is suitable for use as a learning assessment tool for grade 4th students in Elementary School in III Gading Rejo District and V Gading Rejo District because it is valid and reliable, and can be implemented for the benefit of learning assessments actually.

The development of the performance assessment instrument uses the discovery learning model in accordance with the opinion of Budhiwaluyo (2016: 7) which states that the performance assessment instrument is recommended to be used with a learning model that requires students to actively solve problems, such as the inquiry learning model, discovery learning, or problem based learning (PBL). This is also reinforced by McNaught (2015: 73) which show that the Discovery Learning process which is directly supported by performance assessments is useful for detecting students' abilities in terms of knowledge and skills. The results of the study show that discovery learning with performance assessment effective of students mathematical literacy (Khoir: 2019: 112).

2. The Advantages of developing Performance Assessment Instrument based on Discovery Learning

Based on the results of developing a performance assessment instrument discovery learning based has several advantages are:

- a. Make it easy for teachers to assess objectively, especially the psychomotor aspects of students listed on the performance assessment instrument.
- b. This product is student-centered, making it easier to hone performance skills by analyzing through a series of learning scenarios.
- c. Educators are easy to assess the contribution of each student in mastery of the learning process using the assessment guidelines that have been provided.
- d. The performance assessment instrument is made up of material concepts based on the discovery learning steps that will be directing students to build and find knowledge independently.
- e. This performance assessment instrument can be used to assess performance of students, both individually or in groups.

3. The Limitations of the developing Performance Assessment Instrument based on Discovery Learning

Based on the research results, the development of discovery learning based performance assessment instruments has several limitations are:

- a. This product development includes only one sub-theme, from three sub-theme
- b. Limitations in the distribution of instruments to practitioners through a google form assisted questionnaire so that there may be errors in responding to the instrument.
- c. The product developed is only tested for teachers as a practitioner test, not up to implementation to students.
- d. R & D research steps are not completed only in the fifth step due to the existence of policies regarding social distancing.

V. Conclusion

Based on the data analysis of the research and development results that have been carried out, it can be concluded that the product of the performance assessment instrument based on discovery learning developed is valid and reliable in terms of evaluation, material and language, with a reliability level of 0.83 with very good criteria, so it is feasible to be implemented in learning assessments for 4th grade elementary school students.

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Nindy Profithasari, et. al. "The Development of Performance Assessment Instrument Based on Discovery Learning In Fourth Grade Elementary School." *IOSR Journal of Research & Method in Education (IOSR-JRME)*, 10(5), (2020): pp. 50-54.