

Analysis of Student Difficulties in Developing Assessment Instruments (Cognitive and Affektive Spheres) on Mathematics Teaching

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Abstract. This research aims to describe students' difficulties when developing assessment instruments in the cognitive and affective domains of mathematics. In addition, this research also aims to provide information about the causes of difficulties faced by students when preparing assessment instruments. The population of this research is students of *PGSD STKIP Taman Siswa Bima* in the sixth semester who take the learning evaluation. The type of research used is descriptive qualitative research with case study approach. The result of the research shows that students' difficulties in developing the assessment instruments are described as follows: a) the students have not been able to adjust the instruments compiled with the objectives of the learning materials, the aspects to be assessed, the assessment indicator, the instrument filling instruction and the scoring weights. b) students have not been able to formulate questions or statements on the aspects of the assessment are clearly arranged and communicative. 3). In the multiple choice problem, the power of deception has not played a maximum role because the alternative answers are composed giving a tendency for students to choose the correct answer. 4). Student-made test instruments have not considered the problem level. The main causes of various difficulties faced by students in preparing instruments is the lack of knowledge and understanding of students related to the guidelines in preparing the assessment instrument, the lack of mastery of learning materials that result in limited ability to develop assessment instruments and the tendency of students in preparing test instruments just follow the sample test instrument which is given without a good understanding of the guidelines for the preparation of assessment instruments.

1. Introduction

One of the factors that influence the success of the learning process is the ability of teachers to plan, implement and evaluate the learning process. At least there are some general stages done by teachers during the learning process that is preparation, implementation, and assessment. These three stages become a part that must exist in every learning process to achieve the expected results. In order for the three stages to be implemented properly, a teacher must have competence and competence in planning or preparing the learning process, implementing the learning process well, and appraising the students according to their ability and competence.

Regarding the assessment, basically the assessment aims to measure the extent to which the mastery and the ability of students to the material being taught. Harsiati [1] states that by appraising teachers can provide appropriate feed backs for students, so good judgment will be able to provide assistance with learning activities that meet the needs of the students. Assessment is also done to see how the attitude or response of students to learning. And assessment is also done to measure the skills that are formed during the learning takes place. This means that when assessing, teachers should be able to assess student learning outcomes include three aspects of affective (attitude), cognitive

(understanding) and psychomotor (skills). These three domains become aspects that can not be separated from each other at the time of assessment. Assessment to students covering all three domains is conducted using assessment instruments. According to Nurbudiyani [2] the purpose of attitude assessment is to obtain accurate information about the achievement of instructional goals by students, especially at the level of acceptance, participation, assessment, organization and internalization. Therefore the compilation of assessment instruments should be composed including three important areas of attitude, cognitive and psychomotor sphere.

But so far the implementation of a precise and measurable assessment or authentic assessment with all its formats is very complicated to make the teacher resigned. Often teachers develop assessment instruments after the learning process ends and even arrange them in a short time based on the content of the lessons that have been taught. Such circumstances greatly enable the non-functioning of the instructional intentions that have been formulated. Consequently the assessment of the students becomes unmeasurable and not objective. This is generally the case for students who are engaged in PPL activities.

Students of PGSD STKIP Taman Siswa Bima who will carry out PPL shall make an assessment instrument to be used during PPL. But often the student has difficulty in making assessment instruments. Based on the results of observations and initial interviews with students PGSD STKIP Taman Siswa who will practice teaching in schools is still confusion in determining and arranging assessment for students. Whereas when students plunge into practice in schools are required to be ready and have sufficient competence in providing assessment. Similarly for the assessment instrument for mathematics lessons.

Especially for mathematics mathematics, found so many indications of student difficulties in preparing insrumen assessment. Mulyadi [3] states that learning difficulties are a certain condition that is marked by the obstacles in the activities to achieve goals, thus requiring more vigorous efforts to overcome them. These obstacles may be realized and may not be realized by the person who experienced it. If in preparing the instrument, the difficulties in question are the barriers faced by the students formulate the assessment instruments.

The indications are visible when students are asked how to compose a grid problem, making an indicator of the material being taught. Students are still confused to make an instrument of assessment tailored to the subject matter and learning objectives. Therefore, given the existence of such problems, it is necessary to find a solution. The suggested solution is to analyze the students' difficulties in preparing the mathematics assessment instrument, then the result of the analysis is used as a reference for lecturers and students to improve the quality of assessment instruments prepared by the students for the preparation of PPL especially for the assessment instrument on mathematics mathematics.

2. Research Method

2.1 Types of Research

The method used in this research is the observation method, documentation and interview methods. The research design is using the type of evaluation research with a qualitative approach.

2.2 Time and Palce of Research

This research was conducted at STKIP Taman Siswa Bima prodi PGSD in February 2017 until August 2017.

2.3 Subject of Research

The subject of this research is PGSD student of Semester VI which takes course of learning Evaluation where in the course the student is obliged to learn to prepare the assessment instrument as preparation before plunging PPL. One of the instruments that needs to be prepared is the assessment instrument on mathematics learning.

2.4 Data analysis Technique

Technique of data analysis conducted in this research use descriptive analysis which aims to give picture of reality about student's difficulties in arranging instrument of Assessment (Cognitive

Sphere, Affective Sphere) on mathematics lesson. Data from the results of the instruments compiled by the students in the mathematics lessons were analyzed descriptively quantitatively by comparing the average of the empirical scores on each variable measured by the predetermined criteria. The percentage and the average of the calculation shows the category of data revealed, so it can know the position of each variable in the overall or part of the variables studied. In describing the students' difficulties in developing the assessment instruments (cognitive and affective spheres) in the learning evaluation lesson that focused on the assessment instrument for mathematics learning, criteria were used as comparative norms used as comparative criteria in preparing empirical criteria, ie criteria compiled or developed based on field conditions, measured or referring to aspects of student difficulties in developing assessment instruments (Cognitive and Affective Spheres) in the Learning Evaluation Course.

3. Result of Research

The results of research were obtained from data analysis of student duty documents in preparing assessment instruments and student questionnaire data. The assessment instrument that focuses on the analysis is the instrument of assessment on mathematics mathematics. Based on the data analysis document the task of students in preparing the assessment instrument on mathematics mathematics obtained information as follows: (a) 100% of students have been able to develop assessment instruments on the aspects of cognitive and affective, (b) 20% of the students have not been able to determine the objectives, determine the aspects to be assessed, develop indicators of the assessed aspects, prepare the guidelines for filling the instruments and develop the assessment instruments, (c) Although it has been able to develop a good assessment instrument in the affective domain, and cognitive students have not been able to prepare questions even statements on the assessment aspect has not been able to be formulated clearly, firmly and communicatively. (d) Most students have not been able to determine the scoring guidelines, (f) The tendency of students to do assessment on aspects of psiomotor and cognitive so that it appears that students have difficulty in preparing the attitude assessment tool, (g) In the multiple choice problem, the power of deception has not played a maximum role because the alternative answers are composed still there is a tendency for learners to choose the correct answer.

Some examples of students' work in developing an assessment instrument:

No	Indikator Kemampuan Penalaran	Soal Nomor
1.	Menyajikan pernyataan matematika secara lisan, tertulis, gambar dan diagram	1
2.	Mengajukan dugaan	2
3.	Melakukan manipulasi matematika	3
4.	Memberikan alasan/bukti terhadap kebenaran solusi	4
5.	Menarik kesimpulan dari pernyataan	5

Figure 1. Grid of the Cognitive Cognitive Assessment Instrument

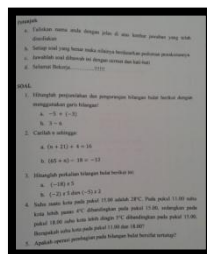


Figure 2. Examples of Cognitive Area Appraisal Instruments

The figures 1 and 2 shown above are examples of assessment instruments that are compiled by the students. In Figure 1, an instrument grid is arranged by students. From the grid that is compiled

the students do not include SK, KD, or the purpose of the material being taught. It becomes a problem and is suspected to be one of the students' difficulties in developing mathematical assessment instruments.

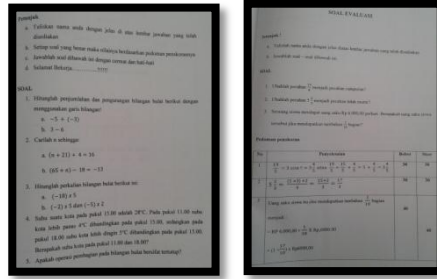


Figure 3. Assessment Instrument in Compiled Without the Grid and Learning Objectives

In addition to the analytical data described above, the following is also presented data questionnaire results of student responses after formulating assessment instruments. The data in question is then categorized based on the following criteria:

Tabel. 1
Scoring Criteria on Student Difficulties in Preparing Difficulties

Interval Skor	Criteria
$90 < X \leq 100$	tidak mengalami kesulitan
$74 < X \leq 90$	Mengalami kesulitan
$50 < X \leq 74$	sedang
$25 < X \leq 50$	Sulit
$X \leq 25$	Sangat sulit

The calculation formula used is:

$$\text{Persentase skor} = \frac{\text{Gained Skor}}{\text{Maximum Skor}} \times 100\%$$

Explanation:

Criteria	Indicator
Tidak mengalami kesulitan	= In accordance with the objectives, SK KD, Indicators, grids, guidelines for the preparation of assessed aspects, establishing instruments (clearly, firmly and communicatively) and having scoring guidelines
Tidak terlalu mengalami kesulitan	= In accordance with the objectives, SK KD, Indicators, grids, guidelines for the preparation of assessed aspects, establishing instruments (less clear, firm and communicative) and have scoring guidelines.
Sedang	= In accordance with the objectives, SK KD, Indicators, grids, guidelines for the preparation of assessed aspects, instrument (not clear, decisive and communicative) and do not have scoring guidelines
Sulit	= Not in line with the objectives, SK KD, Indicators, grids, guidelines for the preparation of assessed aspects, composing instruments (clearly, firmly and communicatively) and having scoring guidelines.
Sangat Sulit	= Very incompatible with objectives, SK KD, Indicators, grids, guidelines for the preparation of assessed aspects, composing instruments (clearly, firmly and communicatively) and have scoring guidelines.

Based on these criteria then obtained information that:

Table 2. Recapitulation of Student Response Results

Interval	Criteria	Recapitulation	
		F	%
$90 < X \leq 100$	Tidak mengalami kesulitan	0	0
$74 < X \leq 90$	Tidak terlalu mengalami kesulitan	10	10 %
$50 < X \leq 74$	Sedang	55	55%
$25 < X \leq 50$	Sulit	20	20%
$X \leq 25$	Sangat Sulit	15	15%

From Table 2. above, it is found that from 100 respondents, there are 12 students or 15% of students studying difficulties with very difficult level in preparing instrument, difficult category as much as 25% and 55% are in medium category. While for the category did not experience difficulties as much as 10% and none of the students who have no difficulty in preparing the assessment instrument in the realm of cognitive, affective and cognitive.

From the above results, data on the causes of student difficulties in formulating assessment instruments were also obtained. The causes are (a) lack of understanding related to guidelines in formulating assessment instruments, (b) Lack of mastery of learning materials resulting in limited ability to develop assessment instruments; (c) Presence of tendency for students in preparing test instruments simply following samples of test instruments ever performed by the previous teacher without being based on a good understanding of the guidelines in preparing the assessment instruments.

4. Conclusion

The result of the research shows that students' difficulties in developing the assessment instruments are described as follows: a) the students have not been able to adjust the instruments compiled with the objectives of the learning materials, the aspects to be assessed, the assessment indicator, the instrument filling instruction and the scoring weights. b) students have not been able to formulate questions or statements on the aspects of the assessment are clearly arranged and communicative. 3). In the multiple choice problem, the power of deception has not played a maximum role because the alternative answers are composed giving a tendency for students to choose the correct answer. 4). Student-made test instruments have not considered the problem level. The main causes of various difficulties faced by students in preparing instrument is the lack of knowledge and understanding of students related to the guidelines in preparing the assessment instrument, the lack of mastery of learning materials that result in limited ability to develop assessment instruments and the tendency of students in preparing test instruments just follow the sample test instrument which is given without a good understanding of the guidelines for the preparation of assessment instruments.

In addition, based on the results of questionnaires, students' responses when composing the assessment instrument obtained information that of 100 respondents there are 12 students or 15% of students mengalami difficulty with very difficult level in preparing the instrument, difficult category as much as 25% and 55% are in the medium category. While for the category did not experience difficulties as much as 10% and none of the students who have no difficulty in preparing assessment instruments both in the realm of cognition and affective.

Reference

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