

Learning Analysis Based on Aspect Humanistics and Constructivistics Assessed from Student's Mathematic Literation Abilities and Characters

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ABSTRACT. The purpose of this study was to describe the mathematics learning process of class V SD Labschool Unnes Semarang in terms of humanistic and constructivist aspects, as well as to describe the mathematical literacy skills and character of students. Specific targets are: (1) knowing the learning process carried out by teachers and students (2) knowing the profile of students' mathematical literacy skills (3) knowing the character of hard work and student responsibility. This research is qualitative with random sampling technique. The main object of this qualitative research is the 6th grade students of SD Labschool Unnes Semarang. The methods used in this research are observation, interviews, documentation and tests. The humanistic aspects of learning tools which are then applied optimally in the learning process can improve the character of students' hard work and responsibility, while the constructivist aspects of learning mathematics can improve mathematical literacy skills. The benefit of this research is the creation of an atmosphere of learning mathematics that is fun and student-centered. can be used as feedback to make it easier to provide knowledge about learning tools and learning processes that meet humanistic and constructivist elements so that they can be applied in better and more effective Teaching and Learning Activities (KBM).

Keywords: *humanistic, constructivist, mathematical literacy, character.*

1. INTRODUCTION

National education aims to develop the potential of students to become human beings who believe and fear God Almighty, have a noble character, are healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens (Kemendiknas, 2010). Education is a process of interaction, in which there are interaction activities that involve teachers as educators and students as learners. According to Dimiyati and Mudjiono (2006: 5-6), that educational action is aimed at developing students to become independent. To be able to develop to be independent, students must be able to learn. When students learn, there will be mental changes in students. Therefore the elements of the learning process play an important role in the learning process that involves teachers and students.

Mulyasa (2004: 19) effective learning is characterized by an attitude that emphasizes effective student learning. Furthermore, Mulyasa explained that effective learning emphasizes how

students are able to learn how to learn (learning how to learn), and through teacher creativity, learning in class becomes a fun activity (joyful learning). However, in fact there are still many teachers who use conventional models in learning mathematics, namely learning that places the teacher as the main source of information and plays a dominant role in the learning process. In conventional learning the teacher acts as a transfer of knowledge to students, students are considered passive recipients of knowledge. Students are not given the opportunity to interact and appreciate objects around them that can function as learning resources, so students are not able to relevant the knowledge they receive in everyday life (Marpaung, 2007).

On the other side the learning paradigm has shifted from traditional learning to new learning. This learning paradigm shift can be seen in Table i below.

TABLE 1. Learning paradigm shift

<i>Traditional Learning</i>	<i>21st Century Learning</i>
<i>Broadcast/Transmission</i>	<i>Model Constructivist Learning</i>
<i>Integration</i>	<i>Transformation</i>

<i>Knowing</i>	<i>Understanding</i>
<i>Learning Teach Skills</i>	<i>Developing 21st century skills</i>
<i>Schooling</i>	<i>Lifelong Learning</i>
<i>Traditional content/context</i>	<i>Contemporary content/context</i>

Source: ISTE National Education Technology Standards for Teachers (USA). Tony Chen is referred to from Suyanto (2007).

Table 1 above shows that teachers need to provide experiences to students as much as possible by utilizing various learning environments that support them, so that teachers can shift from a transmission model to a constructivist learning model. In the learning process, it must be started and aimed at the benefit of humanizing humans themselves. One of the failures in learning mathematics is that students are unable to grasp concepts correctly, because in general they have not yet reached the abstraction process, are still in the concrete stage and only until the understanding of the instrument (instrument understanding), who knows examples but cannot describe them. Students have not yet arrived at a relational understanding, which can explain the relationship between concepts. As a result, students have more and more difficulties in understanding further concepts derived from concepts they have not mastered earlier. According to Sholikhakh, Rismono and Waluya (2012), the shortcut is for students to give their own understanding of the concept, and what happens in students' minds is the occurrence of misconceptions.

The era of global competition that is getting tougher as it is today, makes our education world necessary to equip students with the ability to reason, argue and solve problems in real life so that they can keep up with the times. This ability is called mathematical literacy. Ojose (2011) defines mathematical literacy as knowledge to know and apply basic mathematics in our daily lives. In the past and also in the present, the ability to read or write is a major internal competence that is needed by someone in carrying out daily activities. In line with this, House (2006) states that students' mathematics achievement caused by internal factors (hard work or activity) is better than student achievement caused by external factors.

The quality of education can be seen from the results of evaluations carried out at the local, regional, national and international levels. One of the international institutions that evaluates student achievement in mathematics is the International Association for the Evaluation of Education Achievement (IEA) through the TIMSS study by conducting a survey of fourth grade elementary school students and eight grade junior high school students. This survey is conducted every four years. The survey was conducted for the first time in 1999 and the last time in 2019. For the 2019 TIMSS survey, until the research conducted by the author, the results have never been published. Meanwhile, in 2015 Indonesian junior high school students did not

participate in this survey. Based on the results of the TIMSS survey in 2011, Indonesia ranked 38 out of 42 countries with an average score of 386 below the average TIMSS score of around 500.

The backward position of Indonesian students is also seen in the 2018 PISA score which places Indonesia in the 72nd rank of 78 countries (OECD, 2019). The low mathematics achievement of Indonesian students is caused by several factors. Among the reasons, among others, because students in Indonesia are less accustomed to solving contextual problems, requiring reasoning, argumentation and creativity in solving them (Setiadi et al., 2012), where these questions are characteristic of TIMSS questions. (Wardhani & Rumiati, 2011) said that one of the factors causing the low ranking of Indonesian students in TIMSS and PISA was that Indonesian students generally lacked training in solving problems with characteristics such as questions on TIMSS and PISA.

Departing from these various backgrounds, the researcher tries to play a role in analyzing the learning process as well as the mathematical literacy abilities and character of students. The target to be achieved is to provide a description of the humanistic and constructivist aspects of the learning device and the learning process as well as a description of mathematical literacy skills and the character of hard work and student responsibility.

The formulations of the problems of this study are (1) How is the description of the mathematics learning process in terms of humanistic and constructivist aspects, (3) How is the description of mathematical literacy skills in three-dimensional material and (4) How is the description of students' character. Learning analysis here is limited to the presence or absence of humanistic and constructivist elements in the learning device and learning process. In this study, the description of literacy skills is limited only to the spatial and form content components, as well as questions level 3 and level 4 on the PISA equivalent assessment. Meanwhile, the character description is limited to the character of hard work and responsibility. The objectives of this study were (1) Knowing the mathematics learning process, (2) Knowing the profile of mathematical literacy abilities, and (3) Knowing the description of the character of students' hard work and responsibility. The expected results from this study are to provide a deeper understanding of the tools and processes of humanistic mathematics learning so as to improve student character, and constructivist mathematics learning that can improve mathematical literacy skills, as well as providing information for teachers about the repertoire of science, especially studies.

2. RESEARCH METHOD

The approach in this research is a qualitative approach. This research focuses on the description of mathematics learning in the material of the odd semester 2019/2020 building materials for fifth grade students of SD Labscool Unnes Semarang, which includes data regarding: a description of the learning process, as well as a description of students' mathematical literacy skills and character.

Data collection techniques used were observation, interviews, documentation, and tests. Observation, interview, and documentation techniques are used to collect data on humanistic, constructivist, literacy and character aspects while the test technique is only used to collect data on students' mathematical literacy. The findings or facts obtained are described in the form of descriptive data presentation, then analyzed (interpreted) qualitatively. The validation of the research instrument was carried out by the lecturers of the Postgraduate Program at the Semarang State University. Validation results that are declared valid are used as a research instrument. Validation data were obtained from the results of the validator team on the research instrument. The analysis was carried out by paying attention to the validator's suggestions and comments by calculating the average score of each component.

In qualitative research, findings or data can be declared valid if there is no difference between what the researcher reports and what actually happens to the object under study (Sugiyono, 2009: 268). Moleong (2011: 324) argues that to determine the validity of the data, an examination technique is needed. The implementation of the inspection technique is based on a number of certain criteria. There are four criteria used, namely the degree of trust (credibility), transferability (transferability), dependability (dependability), and certainty (confirmability). The data obtained were then analyzed using qualitative descriptive techniques. The data analysis activities of this research use Miles and Huberman's deep model (Sugiyono, 2009) which includes: data reduction, data display, and conclusion drawing / verification.

3. RESULTS AND DISCUSSION

The results of this study are in the form of descriptions of mathematical literacy skills, as well as the character of hard work and responsibility of class XI students of SMK NU Ungaran. The percentage of humanistic and constructivist aspects that are covered in the learning process will determine how much humanistic and constructivist aspects of students are in the learning process. This is because the learning carried out by the teacher will design how much student activity during the learning process.

The percentage of students' humanistic and constructivist aspects of the learning process can be seen in Table II and Table III below.

TABLE 2. Percentage of student humanistic aspects in the learning process

Student	Humanistic Aspects	category
PD.GM 1	62%	Moderate
PD.GM 2	64%	Moderate
Average	63%	Moderate

TABLE 3. Percentage of student constructivistic aspects in the learning process.

Student	Constructivistic Aspects	category
PD.GM 1	62%	Moderate
PD.GM 2	62%	Moderate
Average	62%	Moderate

Data on mathematical literacy abilities were collected using test techniques that were carried out after completing the delivery of all subject matter. Previously, a test of mathematical literacy skills in class V was conducted. 7. Of the 10 test questions in the trial, 5 questions were taken for the research. Taking these questions by considering the validity, reliability, level of difficulty, and the distinguishing power of the questions.

The process component in the PISA study includes three things, namely to formulate, employ and interpret mathematics to solve problems.

The percentage of process component achievement is shown in Table IV. below.

TABLE 4. Process component achievement

Class	Process Component Average		
	Formulate	Employ	Interpret
V.A	62,31%	16,92%	16,15%
V.B	45,45%	20,60%	20,60%

The highest percentage is in the process of formulating problems mathematically (formulate), because most students are accustomed to understanding the aspects of the problem related to the problem in questions which then describe the formulation of the problem at the known, asked and answered stage. As for the employ process, namely using concepts, facts, procedures and reasoning in mathematics as well as the interpretive process, namely interpreting, applying and evaluating the results of a mathematical process is still lacking. One of the reasons is because students still often misconceptions in solving questions so that the final solution becomes incorrect.

The percentage of ability attainment on the PISA math literacy ability test can be seen in Table V below.

TABLE 5. Percentage of ability achievement on the mathematical literacy ability test

ability	Percentage Class XI.6	Percentage Class XI.1
Communication	62.31%	45.45%
Mathematising	16.15%	20.60%
Representation	3.85%	15.15%
Reasoning and Argument	30.77%	36.36%
Devising Strategies for Solving Problems	23.08%	27.27%
Using Symbolic, Formal and Technical Language and Operation	19.23%	19.23%
Using Mathematics Tools	7.69%	6.06%

The highest percentage is the achievement of communication skills or the ability of students to communicate math problems. This is because students since elementary and junior high school have been accustomed to communicating a math problem by pouring it out at the known, asked and answered stages. In general, students' mathematical literacy skills at level 3 and 4 are still low. The percentage of students who got the maximum score on the spatial content and shape content math literacy skills tests for level 3 and 4 can be seen in the following table VI.

TABLE 6. Percentage of students getting maximum score per question

	LEVEL 3		LEVEL 3		
	Question No.2	Question No.3	Question No.2	Question No.3	Question No.2
Class V.A	15,4 %	23,1%	15,4 %	23,1%	15,4 %
Class V.B	18,2 %	24,2%	18,2 %	24,2%	18,2 %

One of the reasons for the low ability of students' mathematical literacy is because so far the teachers have never provided questions of the PISA equivalent mathematical literacy type. In addition, the factor of students' lack of understanding of the concept also becomes the cause of students often having misconceptions in solving these questions.

The constructivist aspect of the teacher here is very related, because based on the data the results of the study show that the indicators of the constructivist aspects of the teacher are related to the teacher's efforts to direct students to build their own understanding of the concept so that a complex understanding of a material is still in the low category. Hudoyo (2005) states that one of the characteristics of constructivist learning is that information must be linked to other information so

that it integrates with students' schemes so that an understanding of complex information (material) occurs. Based on the results of the analysis of the students' mathematical literacy test answers, it was found that most students did not yet have a complex understanding of the three-dimensional material. Most students only understand the use of the formulas for area and volume in three dimensions, not yet on a complex understanding of the material

The percentage of hard work and student responsibility character categories can be seen in Table VII and Table VIII below.

TABLE 7. Percentage of students' hard work character categories

Kategori	Persentase Kelas V.A	Persentase Kelas V.B
Very high	20,00%	12,12%
High	20,00%	30,30%
Medium	52,00%	54,55%
Low	8,00%	3,03%
Very Low	0,00%	0,00%

TABEL 8. Percentage of student responsibilities character categories

category	percentage Class V.A	percentage Class V.B
Very high	12.00%	9,09%
High	44.00%	30,30%
Medium	40.00%	57,58%
Low	4.00%	3,03%
Very low	0.00%	0,00%

The average percentage of hard work and responsibility characters is in the medium category. The humanistic aspect of the teacher here is closely related. According to Rogers (in Dalyono, 2012: 46-47) one of the important humanistic learning principles is that humans have the ability to learn naturally. This principle is one of the impetus for a student to work hard in learning. The existence of abilities that are driven by a willingness to learn will naturally foster enthusiasm and hard work character for learning in students. Likewise, other humanistic learning principles, namely learning is streamlined when students are involved in the learning process and take responsibility for the learning process. This principle is one of the impetus for a student to be responsible in his learning because students feel involved in learning and feel that they are an important part of the learning process.

4. CONCLUSION

Based on the data and research findings about the learning process which is reviewed based on humanistic and constructivist aspects, as well as the ability of mathematical literacy and character of the fifth grade students of SD Labschool Unness Semarang on the material of Building a Room for the 2019/2020 school year, it is concluded that the learning process carried out by the teacher has also included aspects Humanistic and constructivist, both

in the medium category for teacher 1 and teachers. Humanistic and constructivist aspects of students have also been included in the mathematics learning process in class VA and class VB, both of which fall into the medium category. The constructivist aspects that are still low in the learning process are indicators related to students' efforts to find their own understanding of the concept.

Mathematical literacy skills of students in space and shape content for levels 3 and 4 are still low, both for grade V.A and grade V.B. This is because in addition to teachers who teach have never provided questions about mathematics literacy which is equivalent to PISA, it is also because teachers who teach have not maximally incorporated constructivist aspects of the learning process so that students still often misconceptions in the learning process. work on these math literacy problems The character of hard work and student responsibility is in the medium category, both for students in class VA and students in class VB. One of the reasons is that teachers have not been optimal in incorporating humanistic aspects in the learning process.

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