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Study of Mathematics Learning Ability of Elementary School Students

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ABSTRACT

Measurement of the ability to learn mathematics is not only seen from the cognitive domain, but also seen from the affective and psychomotor domains. The purpose of this study was to determine the ability to learn mathematics in grade II students at SDN 2 Moyongkota only in terms of cognitive, affective and psychomotor. The research method in this research is qualitative. Data collection techniques used are observation, documentation, and interviews. Only a few students have the ability to learn mathematics in terms of the cognitive domain due to talent, potential, and student internal and external factors, there is no student motivation and interest so that it affects affective learning abilities, and lack of skills or skills that affect psychomotor abilities.

Introduction

The target of education is human. Education aims to help students to develop every human potential. Humans and education are two things that cannot be separated wherever humans are, they will definitely need education, this is because the main function of education is to humanize humans, namely to develop all human potential in a better direction. Education will not work if there are no humans, both humans who educate and humans who are educated. From this it can be seen that the purpose of education is normative, that is, it contains elements of norms that are coercive but do not conflict with the nature of the development of students and can be accepted by society as a good life value.

Education implies the teaching of knowledge. knowledge is truth. Truth, wherever, whenever, the same. Education will be said to be successful if it has clear goals and is pursued with clear actions as well. And the setting where education takes place is called the educational environment, especially in the three main educational environments namely family, school, and community (Tirtarahardja, 1990: 39-40).

Mathematics is a branch of science that has an important role in the development of science and technology, both as a tool and in the development of mathematics(Siagian, 2016). Besides

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that, mathematics is a deductive science because in the process of seeking the truth it must be proven by theorems, properties, and postulates after being proven. Mathematics is also a science that is obtained by reasoning using definitional terms carefully, clearly and accurately (Maryati and Priatna, 2017 inMarliana, 2015). Meanwhile according toNovitasari, (2016)Mathematics lesson is a lesson that deals with many concepts. Concepts are abstract ideas with which we can classify objects into examples or non-examples. The concepts in mathematics are related to one another. The interrelationships between one material concept and another are evidence of the importance of understanding mathematical concepts

Based on the definitions of mathematics according to the experts above, it can be concluded that mathematics is a field of science, which includes the study of topics such as formulas, numbers and related structures, shapes and spaces in which they exist, their magnitudes and changes. There is no general agreement on its exact scope or epistemological status. Mathematics is also one of the sciences of several types of science, namely mathematics, physics, biology, psychology, social sciences and linguistics. Based on the view of constructivism, the nature of mathematics is that children who learn mathematics are faced with certain problems based on the construction of knowledge acquired when learning and children trying to solve them. Mathematics is also a science that studies calculations.

Mathematics education in schools is expected to be a vehicle for students to learn about a basic science. Mathematics is a deductive science because in the process of seeking truth it must be proven by theorems, properties, and postulates after being proven. Recently there has been much gossip that the quality of children's education in schools has declined. Children's understanding of the various lessons being taught is lacking and the impact does not reflect passionate enthusiasm. On the other hand, students are stuffed with lots of rules and material so that lessons at school increase. Various demands often do not pay attention to the development of their progress and intelligence. This is exacerbated by the attitude of parents who are too enthusiastic about the capacity and absorption of children so that they give excessive encouragement. The low scores of students in Mathematics are not only due to their individual abilities. students but there are also many other factors. With increased learning abilities students will more easily adapt in any condition. Usually students who study will find it difficult to digest every subject matter and existing knowledge.

To achieve learning outcomes that are in accordance with the goals of learning mathematics, teachers need to evaluate the way they teach. In learning mathematics students not only receive but construct knowledge. How to construct mathematical knowledge can be done with various learning activities and can be applied in student life(NAJOAN, 2011).

One indicator of success in an education will be seen from the learning abilities of students. The initial ability of students is important for the teacher to know before he starts with his learning, because in this way it can be known whether students already have knowledge which is a prerequisite for participating in learning to what extent students already know what material will be presented(Astuti, 2015). According to Shah (1995 inAnugrahwati et al., 2020)learning ability is the skill of a learner, which is owned from the results of what has been learned which can be shown or seen through the results of his learning. So learning ability is an assessment and measurement of learning outcomes that have been carried out by students after students carry out learning process activities which are then proven by a test and these learning outcomes are expressed in the form of symbols both in the form of letters, numbers and sentences that tell the

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results that have been achieved. By measuring learning ability, it can be seen the position of students who are smart, moderate, or slow. By knowing the results of different learning abilities, it will also be known that students' understanding in carrying out the learning process is also different.

Mathematical ability is defined by the National Council of Teachers of Mathematics NCTM (2000 inErnawati, 2016), as the ability to deal with problems, both in mathematics and real life. According to Mahandika (2015 inSiti, 2014)that mathematical ability is a skill or capacity related to students' knowledge and skills in mathematics. The ability to learn mathematics is the ability of individuals in the form of skills in solving mathematical problems (Sriraman, 2008 inSiti, 2014). In addition, students with moderate mathematical abilities tend to be less thorough or careful in carrying out their plans. While students with low mathematical abilities, they are also sometimes mistaken or inaccurate in interpreting existing information and are poor at understanding the problems given.

From some of the explanations above, it can be concluded that mathematical ability is the ability of individuals in the form of skills or abilities related to knowledge and skills in solving mathematical problems.

Several studies in Indonesia also show that by knowing students' mathematics learning abilities, it is easy to determine that these students already have knowledge or abilities that are prerequisites for participating in learning and the extent to which students already know or master the material that will be presented by the teacher. A research conducted byWati & Muzakkir, (2020)about improving learning abilities through student learning styles in mathematics learning conducted at SMPN 10 Banda Aceh. The results showed that in learning students tend to have a visual learning style, but there are still students who also have an auditory and kinesthetic learning style. From research byZakiah & Khairi, (2019)showed that the effect of cognitive abilities on the mathematics learning achievement of fifth grade students at SDN Gugus 01 Selaparang sub-district found that the cognitive abilities and mathematics learning achievements of fifth grade students at SDN Gugus 01 Selaparang District for the 2018/2019 academic year tended to be in the moderate category and there was a significant influence between cognitive ability and mathematics learning achievement of fifth grade students at SDN Gugus 01 Selaparang District for the 2018/2019 academic year. Furthermore, research conducted byDewanti & Purnomo, (2022)shows that the analysis of the mathematics learning abilities of elementary school students in the learning transition period serves to compare the mathematics learning abilities of elementary school students. Last research fromKurniawati et al., (2022)that the analysis of the mathematical abilities of elementary school students in online learning shows that students who have the ability to understand low mathematical concepts are able to achieve 2 indicators, students who have moderate mathematical abilities are able to achieve 4 indicators, and students who have high mathematical abilities are able to achieve 6 indicators .

Based on the results of interviews and observations that when the learning process took place there were many students who were less active in participating in learning activities, especially in mathematics. As for their liveliness only when the teacher appointed one of the students to answer the question. Most of the students saw that their minds were not focused during the lesson. So that it will cause a decrease in students' ability to learn mathematics.

Based on the explanation that has been described above, the researcher wants to conduct a study "Study of Mathematics Learning Ability of Class II Students at SDN 2 Moyongkota Baru",

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to determine students' abilities in terms of cognitive, affective and psychomotor aspects. The focus and sub-focus in this research is the ability to learn mathematics in terms of cognitive, affective and psychomotor.

METHOD

This type of research is qualitative research. This research was conducted at SDN 2 Moyongkota Baru, which is located on Jl. Usuludin, Moyongkota Baru Village, West Modayag District, East Bolaang Mongondow Regency, North Sulawesi Province. The research activities were carried out from 10 December 2022 to 28 February 2023. The research subjects in this study were class II students at SDN 2 Moyongkota Baru. Data collection techniques in this study were observation, documentation, and interviews. Interviews were conducted with class teachers and 10 students. In this study, the types of data presented are primary data sources and secondary data sources. The primary sources are fifth grade students and class teachers, while the secondary sources are journals or books. As for the data analysis in the study, namely, student test question sheets, and transcripts of student and teacher interviews. Data validity checking techniques in this study used triangulation of data sources and methods.

RESULTS AND DISCUSSION

Ability to Learn Mathematics in the Cognitive Domain

To test the remembering aspect (C1) in the cognitive domain, students are given two question numbers where both questions use the same operational verb, namely to mention. The 2 question numbers given are to mention the names of the units of length and to mention the measuring instruments used to measure the units of length.

Figure 1

Questions to test aspects of C1

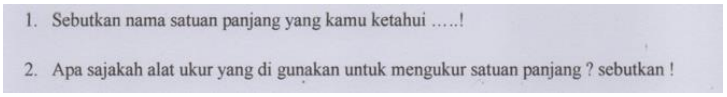
1. Sebutkan nama satuan panjang yang kamu ketahui .....!
2. Apa sajakah alat ukur yang di gunakan untuk mengukur satuan panjang ? sebutkan !

Table 1

Aspect C1 Test Results

NO	Student Code	Score	Qualification
1	AGP	75	Good
2	AGE	75	Good
3	DSK	80	Good
4	ARK	80	Good
5	BAPM	70	Enough
6	SHP	70	Enough
7	NAD	75	Good
8	RHM	75	Good
9	MFP	40	Not enough
10	ASA	50	Not enough

From the table above the student answers show that there are 80% of students who answered correctly. This shows that most students can answer memory questions correctly. Thus questions belonging to this domain can be grouped into questions that have a low level of difficulty

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or in other words easy questions, this is in line with Anastasi and Susan Urbina (2007). , inHanifah, 2014), that the level of difficulty of the questions is related to the percentage of participants who answered the questions correctly. The easier the item is, the greater the percentage

To test the understanding aspect (C2) in the cognitive domain, one question number is given that uses an operational verb, namely explaining.

Figure 2

Questions to test aspects of C2

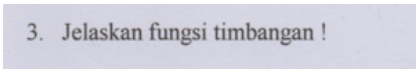

Table 2

Aspect C2 Test Results

NO	Student Code	Score	Qualification
1	AGP	75	Good
2	AGE	80	Good
3	DSK	80	Good
4	ARK	50	Not enough
5	BAPM	55	Not enough
6	SHP	50	Not enough
7	NAD	80	Good
8	RHM	75	Good
9	MFP	50	Not enough
10	ASA	70	Enough

From the table above the student answers show that there are 60% of students who answered correctly. This shows that the questions given in this aspect are still classified as easy questions according to what was stated by Fernandes HJX (2004, inHanifah, 2014), the difficulty level of the item is measured by the percentage of students who answered the item correctly. If the questions are easy, the difficulty index is higher

In testing the applying aspect (C3) there is 1 question number given to this aspect, namely calculating the unit length. In this question students must first add up 1000 cm + 100 cm then if the results are obtained students must change from centimeters to meters by dividing 10 twice. So this question is classified as a question with moderate difficulty.

Figure 3

Questions to test aspects of C3

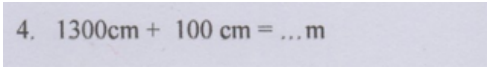

Table 3

Aspect C3 Test Results

NO	Student Code	Score	Qualification
1	AGP	80	Good
2	AGE	50	Not enough
3	DSK	80	Good
4	ARK	55	Not enough

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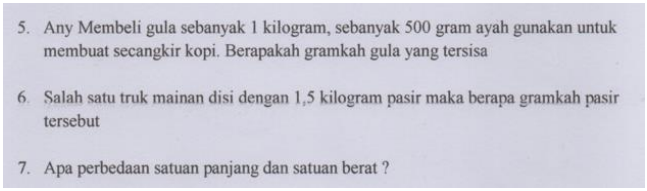
5	BAPM	70	Enough
6	SHP	55	Not enough
7	NAD	75	Good
8	RHM	50	Not enough
9	MFP	40	Not enough
10	ASA	55	Not enough

From the table above, there are 40% of the test results that answered correctly, this is in accordance with what was stated by Arifin (2009 inPutra & Sumbawati, 2017)which states that, as for the interpretation criteria for the difficulty level of the questions, if the total percentage of difficulty is up to 28% - 72%, it is considered moderate.

In the aspect of analyzing (C4) there are three question numbers that use three forms of operational verbs, namely organizing, associating and comparing. In aspect C4, the determinant of student completion is if the student can answer two of the three questions given.

Figure 4

Questions to test aspects of C4


5. Any Membeli gula sebanyak 1 kilogram, sebanyak 500 gram ayah gunakan untuk membuat secangkir kopi. Berapakah gramkah gula yang tersisa

6. Salah satu truk mainan disi dengan 1,5 kilogram pasir maka berapa gramkah pasir tersebut

7. Apa perbedaan satuan panjang dan satuan berat ?

Table 4

Aspect C4 Test Results

NO	Student Code	Score	Qualification
1	AGP	80	Good
2	AGE	85	Good
3	DSK	85	Good
4	ARK	75	Enough
5	BAPM	55	Not enough
6	SHP	60	Not enough
7	NAD	75	Enough
8	RHM	55	Not enough
9	MFP	30	Not enough
10	ASA	60	Not enough

From the table above, there are 30% of students who can answer all three questions, while 20% of students only answer two questions, so the percentage of completeness in aspect C4 is 50%. This is because the number of items given so that there are questions that are not too difficult and also not too easy to test aspect (C4) is in line with the opinion of Dali S. Naga (2002 inHanifah, 2014)who said that the discriminating power of the item is the ability of the item with the score to be able to distinguish test takers from the high group and the low group.

To test the evaluating aspect (C5) in the cognitive domain, there is one number of questions given, namely concluding how the concept is in the units of measurement of length and weight.

Figure 5

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Questions to test aspects of C5

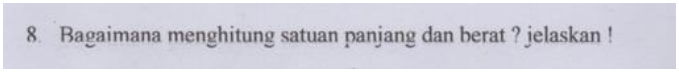

Table 5
Aspect C5 Test Results

NO	Student Code	Score	Qualification
1	AGP	75	Good
2	AGE	80	Good
3	DSK	85	Good
4	ARK	70	Good
5	BAPM	60	Not enough
6	SHP	50	Not enough
7	NAD	60	Not enough
8	RHM	55	Not enough
9	MFP	40	Not enough
10	ASA	60	Not enough

From the table above, there are 40% of students who answered correctly because the questions given have a high level of difficulty. This is supported by Mudjijo's statement (2003 inLumbanraja & Daulay, 2018)which says that the difficulty level of an item is indicated by the percentage of students who answered correctly the item in question.

To test the aspect of creating (C6) in the cognitive domain, two question numbers were given, namely designing an image of a unit length measuring instrument according to the student's idea and constructing a unit length ladder correctly.

Figure 6
Questions to test aspects of C6

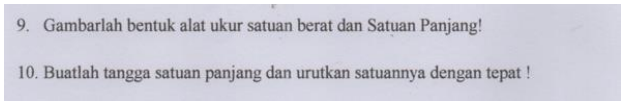

Table 6
Aspect C6 Test Results

NO	Student Code	Score	Qualification
1	AGP	75	Good
2	AGE	60	Not enough
3	DSK	90	Good
4	ARK	80	Good
5	BAPM	60	Not enough
6	SHP	55	Not enough
7	NAD	50	Not enough
8	RHM	45	Not enough
9	MFP	30	Not enough
10	ASA	60	Not enough

Of the two question numbers with a high level of difficulty, only 30% of students answered correctly. So that students who answer the question correctly can be categorized as

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having high order thinking skills (HOTS). This is in accordance with the opinion of Saputra (2016 inPutra & Sumbawati, 2017)The main objective of High Order Thinking Skills is to improve students' thinking skills to be at a higher level, especially those related to the ability to think critically in receiving various types of information, to think creatively in solving a problem using the knowledge they already have, and to be able to make decisions in complex situations. The item difficulty level or also called the item difficulty index according to Sukardi (2011: 136) is a number that shows the proportion of students who answered correctly in one question.

Ability to Learn Mathematics in the Affective Domain

In the affective domain research, the researcher observed student activity and conducted interviews with the teacher to find out the students' interests and attitudes towards learning mathematics in the subject of measuring units of length and weight in class II at SDN 2 Moyongkota Baru. in accordance with the opinion of Sudjana (2010: 29) that the affective domain is related to attitudes and values. Types of affective learning outcomes are seen in various behaviors such as attention to lessons, learning motivation, discipline, study habits, how to respect teachers and classmates, and social relations

To test the receiving aspect (A1) that is seen from the way the student is able to accept every rule or like the subject matter being taught. There are as many as 60% of students who have been able to apply this attitude of acceptance because students are more interested in learning other subjects. according to the Big Indonesian Dictionary KBBI that to receive is to welcome, take, receive, and accommodate everything that is given, sent, and so on, while according to Tampubolon (1991: 41) says that interest is a combination of desire and will that can develop if there is motivation.

To test the responding aspect (A2), it can be seen that students are serious when learning mathematics and easily understand the material provided, so these students can be said to have applied the responding aspects. There are 40% of students who have been able to apply aspects of responding. According to Djalaludin Rakhmat, the response is the activity (activity) of the organism, not merely a positive movement of any type of activity caused by a stimulus, it can also be called a response.

To test the respect aspect (A3), what must be considered is that students can give certain values contained in the measurement concept that exists in mathematics subjects and only 30% of students can apply the respect aspect. This is because many students do not know the value of the concept of measurement in everyday life in accordance with the opinion of Sudjana (2014: 3) "assessment is the process of giving or determining value to certain objects based on certain criteria".

To test the organizing aspect (A4), which is seen from students who are able to unite different values, resolve conflicts between these values and begin to form a value system that is internally consistent and lives up to certain values contained in the measurement material. only 30% of students can apply aspects of appreciating things because they have not yet embedded mathematical values in students according to the opinion of Sholichah et al (2014) that mathematical values are preparing students to be able to use mathematics and a mathematical mindset in everyday life and in studying various sciences

To test the characterization aspect (A5), namely by looking at the ability to apply a value system that has been formed in the individual student and control his behavior for a long time so as to form a characteristic "pattern/view of life" and live up to certain values contained in the

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material measurement. only 30% of students were able to apply the characterization aspect, this was because students had not been able to provide emotional control over difficult questions in accordance with the opinion of Hurlock (1973) explaining that emotional control is a form of effort that focuses on suppressing visible reactions from a stimulus that generates emotions and directs the emotional energy into a form of expression that is useful and acceptable to the environment.

Ability to Learn Mathematics in the Psychomotor Domain

In this area, to measure the ability to learn mathematics in class II of SDN 2 Moyongkota Baru, the researcher observed students' physical activity, for example, the way students wrote, used math aids, and drew. Researchers also conducted interviews with classroom teachers. In accordance with the opinion of Butler (1972) that there are three psychomotor learning outcomes, namely: specific responding, motor chaining, rule using.

The ability of students in the imitating aspect (P1) is to see students who can prepare and work on questions or record material provided by the teacher quickly and correctly. The results showed that 80% of students had skills in the imitating aspect in accordance with the opinion of Simpson (1956) who argued that the results of this psychomotor learning appeared in the form of individual acting abilities and skills.

The manipulation aspect (P2) is seen from the presence of students who can write and apply the teacher's examples quickly and correctly. The results showed that there were 90% of students who had skills in the manipulation aspect. There was one student who could not give the right example. This is because these students play more, this is in accordance with the opinion of Dave (1967) in his explanation which says that manipulation is the ability to carry out simple activities that have never been seen but are based on guidelines or instructions only.

Furthermore, aspects of precision (P3) or accuracy are seen from students who can use stationery and mathematical aids quickly and precisely. There are 40% of students who have skills in aspects of precision or accuracy.

Articulation (P4) that is by looking at students who can combine examples from the teacher and from books. there are 40% of students who have skills in the articulation aspect, this is because these students have high motor chaining abilities as stated by Butler (1972) that in motor chaining in mathematics, students are already able to combine more than two basic skills into one combined skill. for example writing numbers, making lines, using caliper.

The naturalization aspect (P5) is by looking at students who can quickly and accurately use assistive devices spontaneously and their use is in accordance with the existing concepts in mathematical material in this case, namely measuring length and weight, then these students can also describe the shape of the measuring instrument correctly according to its function as well as arrange the unit of measurement ladder with the right arrangement. There are only 30% of students who have skills in the naturalization aspect because of the ability to use rules or use their experience to perform complex skills as stated by Schmitt (1999:60), experiences are personal events that occur due to certain stimuli (for example what is done by the marketer before or after the purchase of goods or services).

Students' cognitive learning abilities are in accordance with the opinion of Ahmad Susanto (2011: 48) that cognitive is a thought process, namely the ability of individuals to connect, assess, and consider an event or event. The results showed that there were three students who had the ability to learn mathematics in all aspects of the cognitive domain. From these data it can be seen that these students have talent or potential for mathematics, this is in accordance

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with the opinion of Ngalim Purwanto (1986: 28) who says: "Talent in this case is closer to the word aptitude which means innate skills, namely about ability (potential certain potential). Other students have different abilities in the cognitive aspect.In addition to this, students' cognitive abilities are also influenced by the family environment. This is shown by thestudents whose parents are both mute so that when at home these students receive less learning or assistance from their parents. The results showed that these students had below average learning abilities because they were often absent from learning mathematics or other subjects because sometimes they joined their parents to work in terms of content in accordance with Slameto's opinion (1995:60) that "External factors that can affect students' abilities There are three groups to learn a person, namely: family factors, school factors and community factors.

Affective learning ability is in accordance with the opinion of Sudjana (2010: 29), namely the affective domain is related to attitudes and values. So to find out the affective ability of students researchers used a test tool, namely a questionnaire. With this test it can be seen the attitudes or emotions of students when learning mathematics takes place. Types of affective learning outcomes appear in various behaviors such as attention to lessons, discipline, learning motivation, respect for teachers and classmates, study habits, and social relationships. Of these tests there are 4 capable in every aspect of affective. This is due to the interest of these students in mathematics so that they can apply an attitude of receiving, responding, assessing, organizing and characterizing mathematics learning is in line with the Big Indonesian Dictionary (1990: 583), that interest or desire is a high inclination towards something. The important thing about interest is its intensity. In general, interest includes affective characteristics that have high intensity.

Psychomotor learning abilities are in accordance with the opinion of Simpson (1956) which states that psychomotor learning outcomes appear in the form of skills and individual acting abilities or performance abilities in this study can be in the form of the ability to work on the questions given, write concepts based on examples from books or explained by the teacher, using stationery or visual aids correctly according to their function, developing skills based on the examples given, and using aids spontaneously that do not match their function but have the same shape. Psychomotor abilities are also shown by having students who can respond to things that are physical, combine several skills, and developing skills, this is in line with the opinion of Butler (1972) that there are three psychomotor learning outcomes, namely: specific responding, motor chaining, rule using. At the level of specific responding in mathematics, students are able to respond to things that are physical in nature, (those that can be heard, seen or touched), or perform skills that are singular in nature, for example how to hold a pencil or ruler correctly. In motor chaining in mathematics, students are able to combine more than two basic skills into one combined skill, for example writing numbers, making lines, using caliper, etc. At the rule using level in mathematics, students are already able to use their experience to perform complex skills,

CONCLUSION

The conclusions obtained from this study based on the results of the discussion that have been obtained, can be stated as follows: that there are still many students in grade II at SDN 2 Moyongkota Baru who do not have the ability to learn mathematics in terms of cognitive, affective, and psychomotor domains. Only a few students have the ability to learn mathematics in terms of the cognitive domain due to talent, potential, and student internal and external factors,

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there is no student motivation and interest so that it affects affective learning abilities, and lack of skills or skills that affect psychomotor abilities

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