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Analysis of Problem Solving Ability Students Mathematis PGMI UINSU Based Zone of Proximal Development Of Students Primary School

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Abstract. The purpose of this study is to describe the problem solving ability of students mathematis work PGMI based object ZPD primary school students, with a descriptive qualitative research methods. Insendental sampling using sampling at half PGMI student V. Data were collected through a test which is divided into two, namely the initial test and final test and through observation and interviews. With a simple statistical analysis results that students who have a high initial knowledge to solve problems working mathematis on objects of primary school students aged 6-10 years by ZPD, also have mathematis problem solving skills are good. While students who have a low initial knowledge unable to solve problems working mathematis on objects of primary school students aged 6-10 years by ZPD.
Keywords. *Early Knowledge, Zone Of Proximal Development (ZPD), Problem Solving*

Abstrak. Tujuan penelitian ini yaitu mendiskripsikan kemampuan pemecahan masalah mathematis mahasiswa pgmi berdasarkan objek kerja ZPD siswa sekolah dasar, dengan metode penelitian deskriptif kualitatif. Pengambilan sampel menggunakan teknik insendental sampling pada mahasiswa PGMI semester V. Data penelitian dikumpulkan melalui tes yang dibagi menjadi 2 yaitu tes awal dan tes akhir dan melalui observasi serta wawancara. Dengan hasil analisis statistic sederhana bahwa mahasiswa yang memiliki pengetahuan awal tinggi dalam menyelesaikan masalah mathematis pada objek kerja siswa sekolah dasar usia 6-10 tahun berdasarkan ZPD. juga memiliki kemampuan pemecahan masalah mathematis yang baik serta mampu memahami masalahnya dengan benar. Sedangkan mahasiswa yang memiliki pengetahuan awal sedang masih memerlukan bimbingan dalam penyelesaian persoalan mathematis pada objek kerja siswa sekolah dasar usia 6-10 tahun berdasarkan ZPD.
Kata kunci. *Pengetahuan Awal, Zone Of Proximal Development (ZPD), Pemecahan Masalah*

1.   Introduction

Zone of proximal development is the midpoint between the point and the student comfortable weak point. As stated in Vygotsky's theory in (Ibrahim and Nur, 2005) that students will move to the zone where it is capable of growing well with the help or without help. In essence a student should be able to have the mental preparation to solve a problem (Russfendi 2006: 178) also must have the ability relationships between concepts reasoning (Restyana et al, 2013: 71) Likewise when they are in a position to understand the material on the lecture. For students PGMI material offered is the material development of competence in preparing prospective teachers who have IMTAQ and science and technology. So it is necessary for an ability to respond to all the challenges that come in the future. In the current era government asked embodiment of renewal in the learning process that takes place at every level of education, which is an ability that can coexist with the rapid development of technology. 4.0 At the time this is one ability that proclaimed is problem-solving ability. Problem solving ability can be raised to hone in math. As disclosed by Chang and Huang, (2014) and Kristianti, Sudhita, & Riastini, (2013) that mathematics is a subject very important role that required to be learned and understood at every level of education. The material in mathematics is a difficult issue to understand instantly, so that the necessary process of thinking, reasoning to analyze.

George Polya understood in the resolution of problems to do with what he called heuristics. In the execution has four stages, namely to understand the problem, and planning solving problems, carrying out of planned and meriview back. The fourth stage should be done sequentially and do not overlap. Supports Polya, Trianto Bruner (2009) revealed that the discovery of the problem on the student to do with scaffolding. Where students need help in solving a problem that exceeds its capacity. Mayer said that solving a portion of the

manufacturing process (scheme) neighbor issues to be addressed. (Kirkley, 2003). While Bell in bondan said that the more effective problem solving in mathematics. (Bondan, 2009). Gama in the success of the process Anggo problem (Anggo, 2011). Branca in Husna et al (2013) revealed that there are three interpretations troubleshooting. The third explanation as follows: as a problem solving process, problem solving as the main purpose and problem solving skills as the basis. If referring to the opinion of the student Branca PGMI the aim should be to make demands as a problem-solving skills.

Realization of achievements can be done by referring to Brunner and Vygotsky theory is to give a stimulus to students to understand the material in the process of mathematics then the stimulus is reduced so as to position them to be responsible in solving the problems given, in the end they can interpret them in the field. Before entering the ZPD step of Vygotsky's theory lecturer must know in advance the ability of students to follow matakuliahnya beginning. Initial capability is commonly called prior knowledge is the first step in every teaching that influence the learning process and the acquisition of the learning experience for students. For the next while the stages in the implementation of these theories are: 1. Students working in the ZPD on elementary school children ages 6- 10 years and lecturers facilitate scaffolding for students to resolve the problem. One of the scaffolding that can be done by applying the learning faculty PBL (problem based learning). 2. Because of the influence of the surrounding environment affect the working cooperatively can also speed up the process of developments capability student problems. 3. Peer tutoring is also useful for students to expand ZPD on elementary school children ages 6-10 years, so that the student develops effective and able to see the problems faced.

The few studies supporting this study include the context of problem solving that is Nia Rahcmawati (2016) with the title of media development scaffolding to enhance the problem solving disposition mathematis students at modeling learning SSCS (search, solve, ctreate and share) Andihniwiranto et al (2013) using the models CIRC (Integrated Reading Compotition). Netriwati (2016) based on the theory of Polya. Pakhrur Razi, et al (2012) Analysis of initial knowledge FMIPA students UNP, John Suban Tenawahang (2016) The influence of learning strategies and prior knowledge of the student learning outcomes, Ika Ratna Puspaningrum (2015) Contributions ability early, interests and independence of the students towards learning outcomes of the course differential equation.

From the description above description, the novelty in this study is the Analysis of Mathematical Problem Solving Ability of PGMI Students Based on the Zone of Proximal Development of Elementary School Students.

2. Method

This research is a descriptive qualitative research. Sampling using the insendental sampling technique in the fifth semester PGMI students. Data collection in this study was carried out by preliminary tests and tests of learning outcomes, observations and interviews. Furthermore, the data are analyzed using simple statistics that are looking for the mean of the results of the managed data. The instrument used was an initial ability test.

3. Results & Discussion

It can be seen that the application is carried out for 16 clients meeting 70% and elerning 30%. The instrument was given at the beginning of the meeting and at the end of the meeting. The goal is to determine the ability of students in the proximal development zone. With the following percentages:
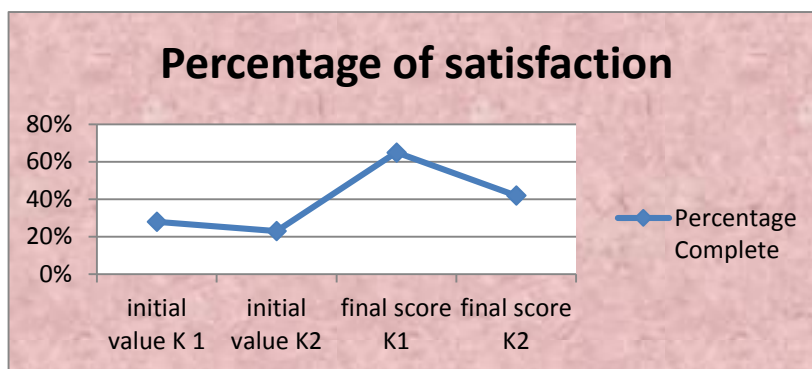
Figure 1. Percentage graph of student's initial and final abilities

Based on the above chart is universally known that the percentage of the initial value of first grade students stood at 28% higher than the initial value acquisition grade students 2. And the percentage of students 'final grades of grade 1, 65% higher than the percentage of students' final grades of class 2, 42%. It can be concluded that the acquisition of student mastery obtained at the initial test and final test ranges from 22 students in grade 1 complete with indicators that have been established, while for students in grades 2 only 11 students who finished with a percentage of 42%.

Table1. Classification of early mathematical knowledge level of students

No	Level of knowledge	Class	
		1	2
1	High initial knowledge	5	4
2	Early knowledge is moderate	2	2
3	Low initial knowledge	28	20
Amount		35	26

In the above table can be clearly seen that many students still have a low initial capability in both the students who were in class 1 and class 2 student residing.
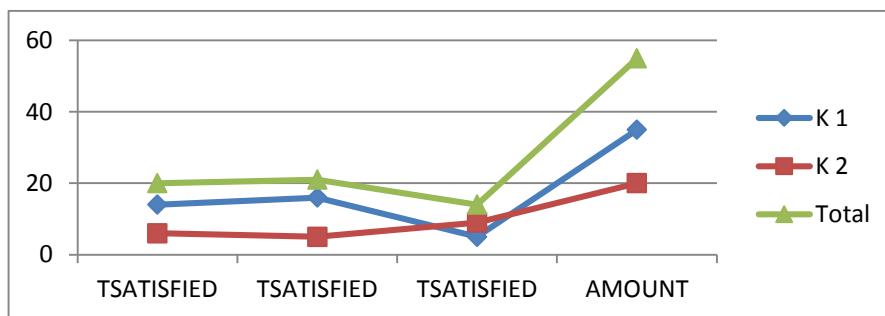
Figure 2. Graphing classification chart of students' mathematical final exams

From the above chart can be seen progesnya that students outperformed students grade 1 class 2. The analysis that students with high mathematical ability does not require any initial guidance in resolving the existing problems and also able to hone problem-solving skills in primary school students age range 6-10 year on work procedures developmentnya proximal zone. While students who have prior knowledge mathematis'm still require guidance despite understand the problem and plan the completion of the problems faced is good but needs to be nurtured in mengkroscek back groove answers generated. Thus, not all students problem-solving ability of primary school age range of 6-10 years is going well. Then, students who have lower initial ability mathematis also have low problem-solving abilities, so that elementary school students age range 6-10 years that it faces still at the stage of trial and error.

4. Conclusion

Holistic students who have a high initial knowledge to solve problems working mathematis on objects of primary school students aged 6-10 years based ZPDnya also has the ability mathematis good problem solving and able to understand the problem correctly. Whereas students who have a low initial knowledge unable to solve problems working mathematis on objects of primary school students aged 6-10 years based ZPDnya. While students who have no prior knowledge was still need guidance in resolving the issue of employment mathematis on objects of primary school students aged 6-10 years on the basis that the Traffic troubleshooting ZPDnya mathematisnya still at the stage of trial and error.

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