

Female Students' Reasoning of Primary School Teacher Education in Solving Geometry Problems

Rosdiana
Universitas Negeri Surabaya
Surabaya, Indonesia

I Ketut Budayasa
Universitas Halu Oleo
Kendari, Indonesia

Agung Lukito
Universitas Negeri Surabaya
Surabaya, Indonesia

Abstract—A current college graduate is expected to use his reasoning to Understand the concepts and logical procedures. Reasoning is important to be attentive and should be developed early on to students. Reasoning for everyone will be different from each other when solving a problem, as an example of a woman's student reasoning would be different from male student's reasoning. The purpose of this study was to obtain information about the profile reasoning female student elementary school teacher education in solving geometry problems. This research is a descriptive exploratory study with a qualitative approach. The subjects in this study were 3 female students of elementary school teacher education, Universitas Halu Oleo. The main instruments in this study were researchers and supporting instruments including geometry problem-solving tests. Student reasoning profile data was collected through interviews with problem-solving and documentation tests by researchers as the main instrument. The credibility of the data collected is tested through triangulation.

Keywords—*geometry problem, female students, student reasoning*

I. INTRODUCTION

Angeles [1] defines reasoning (reasoning) as: (1) process of inferring Conclusions from statements, (2) The application of logic and / or abstract thought patterns in the solution of problems or the act of planning, and (3) The ability to know some things without recourse directly to sense perceptions or immediate experience. This understanding implies that reasoning is related to the process of drawing conclusions and problem-solving. Reasoning can be seen as thinking processes and as the product of these processes [2].

One factor that determines a student's success or failure in reasoning is his ability to reason. In the level of learning mathematics in Higher Education, a situation must be created that provides opportunities for students to develop all the potential for thinking and reasoning (logical thinking) in the direction of lectures in Higher Education. The importance of reasoning for students is because students are expected to be able to use reasoning to understand logical concepts and procedures.

It is associated with the reasoning adopted by the five kinds of the ability of NCTM [3], which includes solving (problem-solving), reasoning and evidence (reasoning and proof), communication (communication), connection (connection), and representation (representation). Based on these five types of abilities, it is clear that reasoning ability is one of the mathematical competencies to be achieved in learning geometry. The reasoning is very important for

students because it can play a role in critical and logical thinking, leading to gathering evidence of making conjectures, establishing generalizations, constructing general arguments, determining conclusions, lead to being able to analyze, synthesize, or integrate, and solve problems or prove.

Kendall [4] focuses on two basic types of reasoning: inductive and deductive, students use inductive reasoning to identify visual and numerical patterns and to make predictions based on these patterns. Then students are introduced to the use of deductive reasoning to explain why these patterns are true.

The context of reasoning is an integral part of the context of geometrical material. Geometry material is abstract so that to learn it requires a process of thinking / reasoning. Thus reasoning and thinking have an important role in learning and solving geometry problems. Therefore solving geometry problems requires the occurrence of a process of reasoning.

Teaching problem solving to students is a lecturer activity to arouse students' motivation to receive and respond to the questions posed and guide students to find solutions.

Solving student problems using 4 stages of Polya's theory [5], namely: a) understanding the problem, b) devising a plan, 3) carrying out the plan, 4) looking back.

II. METHOD

The type of research used is descriptive, explorative research while the approach is a qualitative approach. This research was carried out at the Department of Elementary School Teacher Education, so the subject was 3-semester PGSD students . The selection of subjects is based on a written mathematical ability test in the medium category. There are 2 types of instruments used, namely: the main instrument, the researcher himself because its existence cannot be replaced with someone else or something else and supporting instruments include tests of math skills and problem-solving tests . Data analysis in this study uses analysis [6] consist of three steps, namely data condensation (2) data presentation, and (3) conclusion drawing.

III. RESULT AND DISCUSSION

The results show that the female subject's reasoning in solving problems through the 4 stages of Polya. This can be seen through activities in solving problems from problem-solving tests (TPM) given. In summary, the results of

student research on the phasing phases are explained as follows:

A. *Understanding the problem*

After reading the tests, students can sketch cubes and identify what is known and what is asked in the TPM questions, such as the length of the PQRS. TUVW cube ribs = 12 CM, the ribs are PT, QU, RV, and SW. Asked: Calculate the distance between VW ribs and RSTU diagonal fields.

B. *Devising a plan*

Students can connect between things that are known and what they ask so they can determine the right sequence of steps to solve the problem as follows: the distance between the VW line and the RSTU diagonal plane can be represented by the VM line. How to find the length of the VM line is:

- Pay attention to the RUV triangle
- Looking for UR length
- Search for Area of triangle RUV
- Looking for VM length.

C. *Carrying out the plan*

Students are able to pay attention and find and find every step that is planned to be used in solving problems such as UV length = 12, the area of triangle RUV = 72 , and the length of VM = 6.

D. *Looking back*

Students can review their work from the beginning, both from the sketch, the formula comes to the end result.

IV. CONCLUSION

The differences between men and women in learning mathematics as follows: 1) Men are superior in reasoning; women are superior in accuracy, accuracy, accuracy, and precision of thinking. 2) Men have better mathematical and mechanical abilities than women; these differences are not real at the elementary school level but become more apparent at a higher level. The results showed that female students of elementary school teacher education in solving problems by using reasoning (reasoning) through 4 stages of Polya well namely 1) Understanding the problem , 2) Devising a plan, 3) Carrying out the plan, 4) Looking back.

ACKNOWLEDGMENTS

The author wishes my gratitude to Mr. I Ketut Budayasa and Mr. Agung Lukito as promoter and co-promoter for their support on my work.

REFERENCES

- [1] P. A. Angeles, *Dictionary of Philosophy*. USA: Barnes and Noble, 1981.
- [2] J. Lithner, "A Research Framework for Creative and ImitativeReasoning," *Educ. Stud. Math.*, vol. 67, no. 3, 2008.
- [3] NCTM., *Principles and Standards for School Mathematics*. United States of America: NCTM (National Council Teacher of Mathematics), 2000.
- [4] Kendall, *Discovering Geometry: A guide for Parents*. USA: Kendall Publishing, 2008.
- [5] Polya, *How to solve it*. Princetown, NJ: Princetown University Press, 1973.
- [6] J. Miles, M. B., Huberman, A. M., & Saldana, *Qualitative Data Analysis*. USA: Arizona State University, 2014.