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Improving Student Learning Outcomes Through the Application of the Quantum Teaching Model Using Manipulative Media in the Basic Concepts of Geometry and Measurement Course

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Abstract

Mathematics education, particularly in the field of geometry and measurement, has an important role in the development of students' logical, analytical, and spatial thinking skills. However, in reality, many students of the Elementary School Teacher Education Study Program (PGSD) still have difficulties in understanding the basic concepts of geometry and measurement. The purpose of this study is to determine the improvement of student learning outcomes after learning by applying the Quantum Teaching learning model using manipulative objects in the Basic Concepts of Geometry and Measurement lecture in semester IIIA of the PGSD FKIP Study Program, University of Bengkulu. The method used is a qualitative research method. This type of research is classroom action research. The subjects of this study are 39 students in semester IIIA of the PGSD FKIP Unib Study Program. This study uses test instruments to measure student learning outcomes. The test result data was analyzed in a qualitative descriptive manner. The results showed that there was an increase in the average score of the student learning outcome test from cycle I to cycle II, from 79 to 84. Completeness also increased from 74% in the first cycle to 90% in the second cycle.

Keyword: Quantum Teaching Model, Manipulative Objects, Basic Concepts of Geometry and Measurement

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INTRODUCTION

One of the main keys to the progress of a nation is education. However, the implementation of education, especially learning in elementary schools, starting from the explanation of the material, the presentation of examples of questions and their completion, is still dominated by teachers, resulting in students tending to be passive. Mathematics teachers almost always use the lecture and expository method for the reason, among others, that the material demanded by the curriculum can be achieved on time (Wahyudin, 1999). This is in line with the results of Turmudi's (2008b) research which states that one of the factors that causes low mathematics learning achievement is the mathematics teaching method that is still teacher-centered, while students tend to be passive.

The above learning illustration is in accordance with the opinion of Romberg (1999) stating that mathematics learning, which is based on the conventional approach, consists of three segments, namely (1) checking past homework, (2) presenting new material with examples, and (3) providing problems for the next day. Furthermore, according to Thompson and Senk (in Turmudi, 2008) that each topic is introduced by stating a rule or formula, the rule is followed by an example of applying the formula and then providing practice questions. If this continues to be done, then students will become saturated and will move further away from mathematics as a result of which the motivation to learn mathematics will disappear

Based on observations during teaching the Basic Concepts of Geometry and Measurement course, there are several problems that occur, including low student interest in learning, students are afraid of this course, the material is considered very difficult, students have difficulty understanding the basic concepts of geometry and measurement, students are inactive during study, and student final semester exam scores are below 60.

Based on the problems described above, a learning model is needed that allows students to learn optimally. One of the ideal learning models is the Quantum Teaching learning model. Quantum *Teaching* learning first began at *SuperCamp*, a *Quantum Learning* acceleration program offered by *learning forum*, an international education company that emphasizes the development of academic and personal skills. Results obtained from Supercamp showed that 68% could increase motivation, 73% increase grades, 81% increase self-confidence, 84% increase self-esteem, 98% continue to use skills (DePorter, 2008). This Learning Model is a learning model that converts energy into light. The intended energy is that all interactions that occur in the learning environment during the learning process will accelerate students to absorb information (Depotter, 2008).

Based on the description of the gap between real conditions in the field and the expected ideal conditions, the researcher thinks that by applying the Quantum *Teaching* model learning will help students in understanding mathematical concepts. Thus, the researcher raised the title of the research is "The Effect of *the Quantum Teaching Learning Model* on the Comprehension Ability of Elementary School Students".

METHODS

This study uses the action research method (Action Researh). This method is used to help solve problems and improve the lecture process of the Basic Concepts of Geometry and Measurement course. According to Sugiyono (2015) there are 4 important stages in conducting classroom action research, namely: (1) planning, (2) implementation, (3) observation, and (4) reflection. The research began by compiling a lecture kit, Semester Program Plan (RPS), and evaluation instruments. Furthermore, the lecture was carried out using a device that had been planned. During the implementation process, the research team made observations to see the lecture activities that took place. The results of observations and tests are used as material in reflecting on the learning to plan the device in the next cycle. This research took place in two cycles.

RESULTS & DISCUSSION

Result

This research aims to improve the lecture process in the class of semester IIIB of the Basic Concepts of Geometry and Measurement course. This study provides information about the ability of students of the PGSD JIP FKIP Study Program, University of Bengkulu, in understanding the concepts of geometry and measurement. The data was collected using test instruments. The results of data processing are as follows:

Table 4.1 Score data of IB semester students of the PGSD JIP FKIP Unib Study Program

Cycle	I	II
Total Score	3042	3276
Number of students	39	39
Average score	79	84
% > value 80	74%	90%

The table above shows data that the ability to master the concept of spatial building nets and the concept of circumference and flat building area has improved and is very good.

DISCUSSION

Based on the analysis of data results, it was obtained that the Quantum Teaaching model using manipulative media can improve the learning outcomes of students of the PGSD FKIP Unib Study Program. This is evidenced by the increase in the average score of learning outcomes from 79 in the first cycle to 84 in the second cycle. Likewise, the percentage of learning completion with a score of >80 also increased from 74% in the first cycle to 90% in the second cycle. The Quantum Teaching *model* is a learning model used by teachers as a guideline in planning and implementing learning in the classroom that has steps to grow, naturalize, name, demonstrate, repeat and celebrate (TANDUR) (DePoter, 2008). This model is able to increase student activity and student enthusiasm in learning. Iswadji (in Sari, 2009) argues that manipulative objects in mathematics are a set of concrete objects that are designed, made, assembled or arranged deliberately that are used to help embed concepts or principles in mathematics. In line with that, (2006) argues that manipulative objects are part of the learning media in the form of tools.

CONCLUSION

The conclusion of this study is that the learning outcomes of students who attend lectures with the *Quantum Teaching* model using manipulative objects increase. This is evidenced by the increase in the average score of learning outcomes from 79 in the first cycle to 84 in the second cycle. Likewise, the percentage of learning completion with a score of >80 also increased from 74% in the first cycle to 90% in the second cycle.

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