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The Implementation of the Jigsaw Cooperative Learning Model on the Topic of Measures of Central Tendency in Grade VIII of SMP Negeri 3 Jayapura

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A B S T R A C T

This study aims to describe the implementation of the Jigsaw type cooperative learning model in the topic of Measures of Central Tendency in Class VIII B of SMP Negeri 3 Jayapura in the 2024/2025 academic year. This research is a descriptive study using a qualitative approach. The subjects were determined through purposive sampling, consisting of 18 students from Class VIII B. Data were collected through tests and observations. The implementation of the Jigsaw cooperative learning model in teaching Measures of Central Tendency was carried out very well. This is evidenced by the observation score of 81.5%, indicating a high level of implementation. Student activeness was also high, with an observation result of 81,8%, showing that students were very active during the learning process. Furthermore, the students' learning outcomes showed an average score of 75.4, with 13 students meeting the Minimum Mastery Criteria (KKM) and 5 students not meeting the criteria.

Keywords: *Jigsaw Cooperative Learning Model, Measures of Central Tendency.*

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INTRODUCTION

According to the National Education System Law Number 20 of 2003, education is a conscious and planned effort to create a learning atmosphere and learning process in which students actively develop their potential to possess spiritual strength, self-control, personality, intelligence, noble character, and the skills needed by themselves, society, the nation, and the state. Education in Indonesia consists of three main types: formal, non-formal, and informal education. Formal education includes kindergarten, elementary school, junior high school, senior high/vocational school, and higher education. Non-formal education consists of courses and training centers, while informal education refers to education that occurs within families and the community through independent learning activities.

Subjects taught in formal education encompass a wide range of disciplines, one of which is mathematics. Mathematics is one of the most important subjects. According to Suherman (Dwidarti et al., 2019), mathematics studies patterns of regularity and organized structures. Mathematical concepts are arranged in a hierarchical, structured, logical, and systematic manner, starting from the most basic to the most complex, and covering various other topics within the field of mathematics. One of the reasons students study mathematics is that it serves as a medium for developing logical, systematic, critical, and rational thinking patterns (Rahman & Trisari, 2015).

The objectives of mathematics learning at the elementary and secondary school levels, according to the Ministry of National Education Regulation Number 22 of 2006, are:

1)To understand mathematical concepts, explain the relationships between concepts, and apply concepts or algorithms flexibly, accurately, efficiently, and precisely in solving problems; 2)To use reasoning in recognizing patterns and properties, perform mathematical manipulations to make generalizations, construct arguments, or explain ideas and mathematical questions; 3)To solve problems, including the ability to understand the problem, design mathematical models, solve the models, and interpret the obtained solutions; 4)To communicate ideas using symbols, tables, diagrams, or other media to clarify conditions or problems; and 5)To develop an appreciation of the usefulness of mathematics, as well as persistence and self-confidence in problem-solving.

Teachers must create an enjoyable classroom atmosphere to achieve the objectives of mathematics learning. In such an environment, students become enthusiastic about learning mathematics, and the material is better understood. In reality, however, some teachers are unable to foster an engaging classroom environment, resulting in students' lack of enthusiasm and poor understanding of the material. This unpleasant atmosphere often stems from the teacher using teacher-centered models of instruction, which reduce student engagement during the learning process. Therefore, one of the necessary improvements is that teachers must try to implement learning models suited to the characteristics of the students. Choosing an appropriate learning model can increase students' interest in learning mathematics and improve their learning outcomes (Duppa, 2017).

Based on the researcher's interview with a mathematics teacher at SMP Negeri 3 Jayapura, it was revealed that many students struggle with the topic of Measures of Central Tendency. This is due to the teacher's use of lecture-based methods, which result in minimal student involvement in the learning process and lead to limited understanding of the material. Although the teacher occasionally forms study groups, many students do not take responsibility within their groups. The implementation of the Jigsaw cooperative learning model in the topic of Measures of Central Tendency is expected to motivate students, increase their sense of responsibility, and encourage active participation in learning mathematics.

As time progresses, learning models continue to evolve and can be implemented by teachers in mathematics instruction—one such model is cooperative learning. Cooperative learning involves organizing students into small, heterogeneous groups to work together as a team in solving problems, completing tasks, or achieving shared goals (Hayati, 2017:14). Hayati further states that the goals of cooperative learning are: 1) to help learners achieve optimal academic outcomes and develop social skills; 2) to teach collaboration and cooperation skills; and 3) to empower high-achieving learners to act as peer tutors for lower-achieving learners. Therefore, cooperative learning benefits all students—whether low, medium, or high achieving.

One type of cooperative learning model is the Jigsaw model. According to Arens (as cited in Yulianah, 2019:23), the Jigsaw cooperative learning model involves students learning in small, heterogeneous groups and taking responsibility for mastering a specific portion of the material in expert groups, then returning to their home groups to teach what they have learned. This model is designed to increase students' responsibility for their own learning as well as for the learning of their peers. The Jigsaw model can be applied to topics that are not sequential or interdependent, such as Measures of Central Tendency (mean, median, and mode).

METHOD

This study aims to describe the learning process on the topic of Measures of Central Tendency using the Jigsaw cooperative learning model. This research falls under descriptive research with a qualitative approach. According to Sukardi (2003:157), descriptive research is a method that attempts to describe and interpret an object as it is. Furthermore, Sugiyono (2015:15) states that qualitative research is research based on the post-positivism paradigm, used to examine natural conditions of the research object. The research data describe the

conditions of the learning process using words, with the descriptions presented in accordance with the actual facts and situations that occurred during the research.

Respondents

The selection of subjects in this study was conducted using purposive sampling. According to Sugiyono (2015:124), purposive sampling is a sampling technique based on certain considerations. In this case, the selection of subjects was based on the recommendation of the Grade VIII mathematics teacher at SMP Negeri 3 Jayapura, namely a group of students who met the criteria for heterogeneous grouping in terms of student ability. The subjects in this study were all students of Class VIII A at SMP Negeri 3 Jayapura, totaling 18 students.

Instruments

The instruments in this study are divided into two categories: primary instruments and supporting instruments. The primary instrument in this study is the researcher themself. One of the characteristics of qualitative research is that the researcher acts as both the instrument and the data collector, referred to as the main instrument, because the researcher determines the entire scenario and obtains data from field notes (Kusumastuti & Khiron, 2019: 96). The supporting instruments in this study are: a) Written Test. The test used in this study is a written test. The test instrument consists of essay-type questions adapted to the material taught, namely measures of central tendency. The test in question is a learning outcome test. This post-test was given to students individually after the implementation of the Jigsaw cooperative learning model. The test covered all subtopics included in the material on measures of central tendency. b) Observation Sheets. Observation instruments are more effective when the information to be collected involves natural conditions, behaviors, and the work results of respondents in a natural setting (Komara in Cahyaningsih, 2019). In this study, there were two types of observation sheets: student activeness observation and observation on the implementation of the Jigsaw cooperative learning model.

Procedures

The research procedure consists of a series of structured steps carried out from the beginning to the end of the study, as follows:

Conducting observations to determine the research location.
Determining the research location.
Determining the research subjects.
Designing the Lesson Plan (RPP) using the Jigsaw cooperative learning model on the topic of measures of central tendency.
Designing student worksheets (LKS) and individual tests according to the material and learning objectives.
Conducting a trial implementation of the study by teaching the material on measures of central tendency according to the prepared lesson plan.
Collecting research data by carrying out the learning process in accordance with the prepared lesson plan.
Conducting observations during the learning process.
Administering individual tests to students after the learning activity.
Checking and recording the results of the students' individual tests.
After obtaining the research data, conducting data analysis.
Preparing the research report and drawing conclusions.

Data analysis

Data analysis techniques are used to analyze the data in the research. The data analysis was conducted before entering the field, during the fieldwork, and after completing the fieldwork. The stages of data analysis are as follows: 1)Data analysis before entering the field. Analysis is carried out on the results of preliminary studies or secondary data used to determine the focus of the research. However, this research focus is temporary and will develop after the researcher collects data and during their time in the field (Sugiyono, 2015: 336). The initial data referred to includes determining the research location and collecting

preliminary information related to the research to be conducted. 2) Data analysis during the fieldwork. Data analysis during fieldwork is conducted while data collection is taking place, as well as after the data collection is completed within a specific period (Sugiyono, 2015: 337). Data collection is carried out using observation sheets for both teachers and students, assessed by an observer—namely a mathematics teacher at SMP Negeri 3 Jayapura—through the student activity observation sheet based on the Jigsaw Cooperative Learning Model. 3) Data analysis after completing fieldwork. After the fieldwork is completed, the collected data consists of the results of individual tests, which are used to assess students' understanding.

FINDINGS AND DISCUSSION

Description of Research Results

The implementation of the Discovery Learning model assisted by a plaque teaching aid was carried out according to the steps outlined in the Lesson Plan (RPP), which was implemented in one meeting:

Introduction

The introductory activity began with the teacher asking one of the students to lead the preparation and then greeting the class. The teacher then asked the students, "How are you today?" The students responded, "We're good, Ma'am." The teacher invited the students to pray before starting the lesson. After the prayer, the teacher checked attendance and informed the students of the topic for the day's lesson, which was measures of central tendency (mean, median, and mode).

The teacher then motivated the students by relating the topic of mean, median, and mode to everyday life and explained the learning objectives. Next, the teacher introduced the learning model to be used during the lesson — the Jigsaw cooperative learning model: "Today we will be learning using the Jigsaw cooperative learning model. You will be divided into three home groups. Each group will receive different materials. There will be three topics in total: mean, median, and mode. Students with the same topic from different home groups will form new groups called expert groups. There will be three expert groups: one for mean, one for median, and one for mode."

Core Activities

Phase 1: Presenting Information

In this phase, the teacher introduced and explained the topic of central tendency (mean, median, and mode).

Phase 2: Organizing Students into Learning Groups

The teacher divided students into three home groups, each consisting of 6 students: "I will divide you into three home groups, each with six members." Each group received a worksheet (LKK) containing three tasks: one each for mean, median, and mode. After distributing the materials, the teacher instructed students from different home groups who had the same topic to gather in their expert groups.

Phase 3: Guiding Group Work

The teacher guided the students in their expert groups as they worked through the expert worksheets (LKK).

Phase 4: Evaluation

After returning to their home groups, students shared and discussed the results of their expert group discussions. The teacher then asked representatives from each group to present their findings from activities 1 to 3.

Phase 5: Giving Group Rewards

After completing the individual tests, the teacher rewarded each group.

Closing Activity

In the closing activity, the teacher gave students the opportunity to ask questions about any concepts they didn't understand regarding mean, median, or mode. Then, the teacher guided the students to summarize the lesson together.

Observation Results of Student Activeness

In this research, student activeness was measured using an observation sheet filled out by the Grade IX math teacher. The result showed that the implementation of the Jigsaw cooperative learning model in teaching Measures of Central Tendency to Class VIII B students at SMP Negeri 3 Jayapura reached 81.8%, categorized as very good. This percentage indicates that student activeness during the learning process was in the very active category.

Observation Results of the Implementation of the Jigsaw Cooperative Learning Model

The observation of the implementation of the Jigsaw cooperative learning model on the topic of Measures of Central Tendency in Class VIII B of SMP Negeri 3 Jayapura showed a score percentage of 81.5%. This indicates that the use of the Jigsaw model in teaching this topic falls under the very good category.

Individual Test Results

At the end of the lesson, after each group completed their worksheets, the researcher gave an individual test to assess students' understanding of the material. The average score on the individual test was 75.4, which exceeded the Minimum Mastery Criterion (KKM). A total of 13 students met the KKM, while 5 students did not.

CONCLUSIONS

Based on the research results and discussion, it can be concluded that the implementation of the Jigsaw cooperative learning model on the topic of Measures of Central Tendency in Class VIII B of SMP Negeri 3 Jayapura was carried out effectively. Throughout the learning process, the researcher implemented activities from the introduction to the closing stage as outlined in the Lesson Plan (RPP), following the syntax of the Jigsaw cooperative learning model. The application of the Jigsaw cooperative learning model on the topic of Measures of Central Tendency in Class VIII B of SMP Negeri 3 Jayapura for the 2024/2025 academic year was implemented very well. The results of the study show that the implementation of the Jigsaw model was very effective, as indicated by the observation score percentage of 81.5%. Furthermore, the observation of student activeness yielded a result of 81.8%, indicating that students were highly active during the learning process. Likewise, in terms of learning outcomes, the average score was 75.4, with 13 students meeting the Minimum Mastery Criterion (KKM) and 5 students not meeting the KKM.

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