Implementation of the Guided Discovery Learning Model Assisted by Parachute Teaching Aids on the Material of Relationships Between Angles

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Abstract
This research is a descriptive qualitative research. The subjects of this research were 31 students of class VII A of SMP YPPK Santu Paulus Abepura. The selection of subjects used the purpose sampling technique. The research instruments used were individual tests, teacher observation sheets and student observation sheets. This study aims to describe the implementation of the guided discovery learning model on the material of relationships between angles assisted by parachute teaching aids (line and angle boards) in class VII A of SMP YPPK Santu Paulus Abepura. Based on the results and discussion of the learning process by applying the guided discovery learning model on the material of the relationship between angles assisted by parachute teaching aids (line and angle boards) has gone very well. This is shown in the results of observations and individual tests falling into the very good category with the percentage of teachers in applying the guided discovery learning model of 97.89%, student activity of 94.21%, and an average individual test score of 92.74. By applying the guided discovery model to the material of the relationship between angles assisted by parachute teaching aids, students can become active and motivated in participating in mathematics learning.

Keywords: *Guided discovery learning model; Parachute teaching aids; Relationship between angles*

INTRODUCTION

Mathematics is a universal science that underlies the development of modern technology. Mathematics plays an important role in various disciplines and advances human thinking, equipping students with the ability to work together (Puspalita, Nurhanurawati, and Coesamin 2022). According to (Kurniasih 2017), mathematics is broadly divided into 4 branches: arithmetic, algebra, analysis, and geometry. According to Sunardi (Firmansyah 2020:1), geometry is generally quite easy for students to understand compared to other branches of mathematics. However, in reality, most students do not understand the concept of geometry, and students are even less interested in learning mathematics. Therefore, the role of teachers is very important as a learning component that is able to choose the right model, method, strategy, and approach to the material to be taught so that they can provide a good understanding to students and achieve the desired results. This is in line with the objectives of the Independent Curriculum Implementation, which aims to give students the freedom to think, innovate, and create. Teachers play a vital role in actively engaging students in the learning process and making learning more meaningful and enjoyable.

In reality, in the implementation of learning in schools, many teachers still teach directly and dominate. One example is at YPPK Santu Paulus Middle School. Through interviews, researchers with one of the seventh-grade mathematics teachers at YPPK Santu Paulus Middle School stated that mathematics learning, especially on the relationship between angles, still uses direct learning methods. Teachers rarely apply learning models and use learning media, resulting in students lacking understanding and being less motivated to participate in mathematics learning.

In order to achieve the quality of learning in accordance with the objectives of the Independent Curriculum Implementation, alternative solutions are needed to overcome the problems mentioned above, one of which is by implementing a learning model.

One learning model that can guide students to learn actively and construct their own knowledge is the guided discovery model.

Guided discovery learning is a learning model that can make students actively involved and required to be independent in solving or solving problems, finding concepts or theories, with the teacher as a facilitator or guide (Mayang 2018).

Based on the characteristics of the guided discovery learning model, it can be an alternative for teaching the relationship between angles.

This learning model requires students to be actively involved and think critically.

In line with the research entitled "application of the guided discovery model on the material of the relationship between lines and angles" it says that the guided discovery learning model can encourage students to think for themselves through assistance from teachers or peers and can make students actively involved in learning to improve their learning outcomes (Firmansyah 2020:2).

In addition to the use of learning models, the use of instructional media, specifically visual aids, is also crucial in the learning process. Lack of visual aids during learning activities can lead to students being less motivated to participate in mathematics lessons. The presence of visual aids can attract students' attention and facilitate their understanding of the material being taught.

In line with research results which say that teachers must create an active learning atmosphere, byuseteaching aids in the classroom will make students happier, interested, motivated and enthusiastic about learning (Yamomaha 2020).

One example of a teaching aid is a parachute (a board showing lines and angles). This tool is expected to make it easier for teachers to convey concepts about the relationships between angles in a more concrete, concise, and precise manner. It is also expected to attract students' attention, thus increasing their motivation to participate in mathematics.

Based on this background, it is hoped that the quality of learning can be realized in accordance with the curriculum objectives that want students to be actively involved in thinking, innovating, and creating so that students are more motivated in participating in mathematics learning. Therefore, this study aims to describe the guided discovery learning model on the material of the relationship between angles assisted by parachute teaching aids (line and angle boards).

METHOD

This research is a qualitative descriptive study. According to (Zellatifanny and Mudjiyanto 2018), qualitative descriptive research aims to describe "what is" about variables or conditions. This study aims to describe the application of the guided discovery learning model to the material on the relationship between angles with the aid of parachute teaching aids (line and angle boards).

The research subjects were determined using purposeful sampling techniques. According to Notoatmodjo (Ria 2018), Purposive sampling is a technique for determining research subjects based on specific considerations. In this case, the considerations referred to are the mathematics teacher's assessment of the students' abilities.

Core research consists of two instruments. The primary instrument is the researcher. According to Afrizal (Thalha Alhamid and Budur Anufia 2015), explains that in qualitative research, the researcher himself is the main instrument in the research, there is no other choice but to make humans the main instrument in research. Supporting instruments include test sheets and observation sheets. According to Lestari and Yudhanegara (Wati 2019), test sheets are sheets used to measure each student's knowledge, consisting of individual test sheets, teacher observation sheets, and student activity observation sheets.

Data collection techniques in this study are: individual tests after the test is given, the researcher analyzes the results of the individual tests, then the results of the analysis become data to see the level of thinking of each student after participating in learning; teacher and student observations, the observer observes the activities of researchers and students during the learning process, each activity carried out by researchers and students is assessed by the observer by circling the indicator achievement score, from these scores, the researcher then adds up and calculates the final score percentage, the percentage is used by the researcher to see the implementation of the learning process.

Data analysis techniques in research:

1. The analysis techniques used in presenting research results include data reduction, data presentation, and drawing conclusions. The video recordings recorded during data collection were reviewed by the researcher, then simplified, categorized, and presented descriptively, from which conclusions were drawn.

2. The individual test sheet analysis technique involves collecting observational data, then summarizing and adjusting it to predetermined interpretation criteria. Each student's score is presented in a table, calculated, analyzed, and then conclusions are drawn.

3. The analysis technique for teacher and student observation sheets was carried out by summarizing the collected teacher observation score data and adjusting it against established interpretation criteria. The data was presented as a percentage, analyzed, and then conclusions were drawn.

RESULTS AND DISCUSSION

In the pre-research phase, researchers created instruments, including teaching modules containing student worksheets (LKPD), individual tests, and observation sheets, and prepared parachute demonstration materials. After the instruments were created, they were validated by expert lecturers.

In this study, each group received a worksheet (LKPD) and teaching aids to help students find the information or data they needed for the subject matter. In accordance with the learning model, the researcher consistently provided guidance to students in their activities of finding or obtaining information.

In the learning process using the guided discovery model, researchers saw that students were more enthusiastic and enthusiastic, as seen when researchers distributed LKPD and teaching aids, completed each stage of the guided discovery model, and when concluding the findings obtained.

The data obtained in this study are:

1. Discussion of research data on the process of implementing the guided discovery learning model assisted by parachute teaching aids
   a. *Stimulation*
      At the level *stimulation refers* to the stages of development of Piaget's cognitive theory of assimilation and accommodation (Harefa 2024).
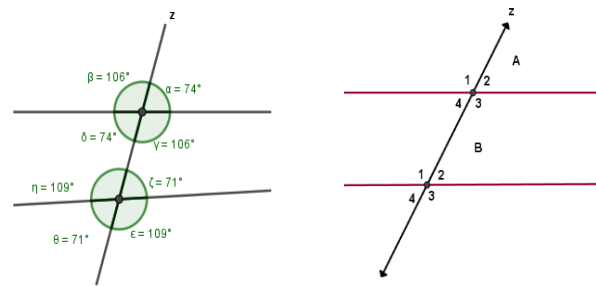

Gambar 1 Stimulus

The question regarding Figure 1 generated confusion, stimulating students' knowledge to find the answer to the researcher's question. Therefore, this stimulation stage aligns with the stages in the guided discovery learning model.

b. *Problem Statement*
   At this stage, the researcher presents an everyday case involving two parallel lines intersected by a third line. This case raises a problem in the form of a question about the relationship formed at street corners.
   At this stage, the researcher also directed students to take measurements on the parachute demonstration equipment (line and angle boards).
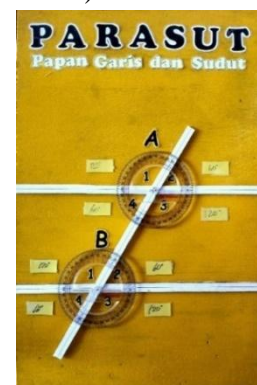
Gambar 2 Alat Peraga Parasut

The parachute demonstration tool (Figure 2) is an example of the application of one of Bruner's cognitive developmental learning stages, the enactive stage (Wahid 2022). At this stage, students engage in activities to understand problems by directly using or manipulating objects.

c. *Data Collection*

The researcher will guide students to conduct experiments filling out the data collection table according to the angles obtained from the previous stage, namely finding the angle size using a parachute prop. At this stage, the researcher displays an image representing one of Bruner's cognitive development learning stages, namely the iconic stage. At this stage, students are also directly introduced to symbols; this stage is one of Bruner's cognitive development learning stages, namely the symbolic stage (Wahid 2022).

d. *Data Processing*

At this stage, students will fill in the table processing data from each experiment according to what was obtained at the data collection stage.

e. *Verification*

At this stage, researchers together with students prove using the GeoGebra application.

f. *Generalization*

In the final stage, the researcher directed students to fill in the conclusion column according to what the students had obtained in the previous stage.

2. Teacher observation results

Based on the teacher's observations, the mathematics teacher's score percentage was 97.89%. The researcher's score percentage indicates that the implementation of learning using the guided discovery model with the aid of parachute teaching aids is in the very good category.

3. Student observation results

Based on the results of observations of student activity, the percentage score obtained by the mathematics teacher was 94,21%. From the percentage of scores obtained by the researcher, it shows that the implementation of learning using the guided discovery model assisted by parachute teaching aids is included in the very good category.

4. Individual test results.

Based on the results of the individual test, it is known that the scores of students who achieved the Minimum Completion Criteria (KKM) in class VII A of SMP YPPK Santu Paulus were 29 students and 2 other students were below the KKM set by the school, namely 75. From the results of the individual test, the average score was 92.74, which is included in the very good category.

CONCLUSION

Based on the results of the study, the application of the guided discovery learning model on the material of the relationship between angles assisted by parachute teaching aids in class VII A of YPPK Santu Paulus Middle School has been implemented very well. This is shown in the results of observations and individual tests that fall into the very good category with the percentage of teachers in applying the guided discovery learning model of 97.89%, student activity of 94.21%, and an average individual test score of 92.74.By applying the guided discovery model to the material on the relationship between angles with the help of parachute teaching aids, students can become active in the learning process, the knowledge obtained by students becomes more meaningful and students become motivated in participating in mathematics learning.

SUGGESTION

With the results of this research, several suggestions can be given as follows:
1. Teachers should carefully consider using the guided discovery learning model with the aid of visual aids. This is because the guided discovery learning model has stages that must be completed to achieve the desired results.
2. Teachers are expected to be able to carry out apperception well so that students can easily carry out discovery activities and understand the material being taught.
3. Teachers must be able to manage the class well so that students can achieve success in the learning process.
4. Teachers should often apply learning models so that students are familiar with each stage of the learning model and also by applying learning models, students will not feel bored so that students become motivated in participating in mathematics learning.

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