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Application of guided discovery learning model using a scientific approach to improve learning activities and outcomes

Muslimin
SDN Tawangrejo I
Email: muslimah384@gmail.com

Abstrak

From the results of the student evaluation, there were 8 students out of a total of 17 students or 47.1% of students who had not reached the Minimum Completeness Criteria (KKM), which was 70 with an average score of 69.7. The aims of this study were (1) to determine the application of the guided discovery learning model with a scientific approach to improve learning activities and outcomes; (2) To find out the increase in student activity and learning outcomes through guided discovery learning models with a scientific approach. This research uses two cycles of action research. Each cycle consists of four stages, namely: planning, implementation, observation, and reflection. The target of this research is the fifth grade students of SDN Wajik for the academic year 2019/2020. The data obtained in the form of formative test results, observation sheets of teaching and learning activities and interviews. The results of the research application of the guided discovery learning model using a scientific approach have a positive effect on increasing learning activities and outcomes, and this learning model can be used as an alternative in thematic learning.

Keywords: learning outcomes, learning activities, guided discovery learning

Introduction

Education has an important role in improving the quality of Indonesian human resources, so that they become Indonesian people who believe and fear God Almighty, have noble character, are independent, responsible, advanced, intelligent, skilled, creative, productive, physically and mentally healthy. Education is one of the most important needs so that almost all aspects of life require education (Anderson, L. & Krathwohl, 2001; Suryanto, Degeng, Djatmika, & Kuswandi, 2021). The teacher has applied a scientific approach to spur students' courage and develop creativity by providing hands-on experience. The lack of learning strategies that need to be carried out by teachers causes students to feel less enthusiastic and 40% of them have difficulty understanding the subject matter. (Attard, Mountain, & Romano, 2016; Clerkin, 2019). The 2013 curriculum emphasizes not on rote memorization, but on students' overall understanding of the content of the material.

In the 2013 curriculum, it is recommended to use a learning model that can guide students to be active in learning. These learning models include: project based learning, problem based learning, and discovery learning (Casado-Ledesma, Cuevas, & Martín, 2021; Foster & Yaoyuneyong, 2016; Suryanto, Degeng, Djatmika, & Kuswandi, 2020; Yusuf, Tarumasely, Suryanto, & Machsunah, 2021). There are two types of discovery learning, namely pure discovery learning and guided discovery learning. To get maximum learning outcomes, guided discovery learning is needed by students (Sali, 2020; Suryanto, Warring, Kartikowati, Rorimpandey, & Gunawan, 2021; Vasylivna Knysh, 2020). The guided discovery learning model is a teaching approach where the teacher gives students examples of specific topics and guides students to understand the topic (Rousseau, Gamble, & Eggermont, 2017; Van der Kleij, Feskens, & Eggen, 2015).

According to Eggen, the guided discovery learning model is a teaching approach in which the teacher gives students examples of specific topics and guides students to understand the topic. The

advantages of the guided discovery learning model are: (a) this knowledge can last a long time, is easy to remember and easy to apply to new situations, (b) improves students' reasoning, analysis and problem solving skills without the help of others, (c) increases student creativity to continue to learn and not just accept it, (d) skilled in finding concepts or solving problems (Chien & Chu, 2018; Glăveanu, 2018; Suchacka, Muster, & Wojewoda, 2021). There are ten steps of applying guided discovery learning to students, including (a) *Introduction*; (b) *Review*; (c) *Overview*; (d) *Investigation*; (e) *Representation*; (f) *Discussion*; (g) *Invention*; (h) *Application*; (i) *Summary*; (j) *Assesment*.

The scientific approach is a student-centered approach to learning. In learning with a scientific approach, students construct knowledge for themselves. For students, knowledge is dynamic, evolving from the simple to the scope, from the scope and around the wider scope, and the concrete abstract. (Buisine, Besacier, Aoussat, & Vernier, 2012; Glăveanu, 2018). As developing human beings, students have, are currently, and/or will experience four stages of intellectual development, namely sensorimotor, preoperational, concrete operations, and formal operations. Sensory motor level (0-2 years), the child's thinking is based on sensory actions. Pre-operational level (2-7 years), children's thinking is characterized by the use of language and signs to illustrate concepts (Anderson, L. & Krathwohl, 2001; Blom, Segers, Knoors, Hermans, & Verhoeven, 2019; Suryanto, Warring, et al., 2021). The concrete operational level (7-11 years) is characterized by the use of clear logistical rules (Parsons, 2019). The formal operations stage is characterized by abstract, hypothetical, deductive, and inductive thinking. The 2013 curriculum has a modern pedagogic dimension in learning, which uses a scientific approach. The scientific approach is observing, asking, trying, processing, presenting, concluding, and creating for all subjects.

Method

This research was conducted at SDN Tawangrejo I, Lamongan Regency. The data sources are all students of class V, totaling 17 students. The data specifically concerns the results of observing the condition of students when carrying out the learning process, the indicators used as a determinant of the success of increasing understanding of the material and the results of learning tests about the level of students' abilities. understanding in understanding the material. The research design used in this research is the CAR design which involves qualitative data. Qualitative data in the form of a description of the classroom atmosphere when participating in the learning process, the activeness of students in asking questions and the enthusiasm of students in the learning process. The instruments used in this study include: teacher and student activity observation sheets and tests at the end of each cycle. The observation instrument is based on the basic components of guided discovery learning through a scientific approach. In this study, the researcher used several data collections, including (1) Interviews; (2) Observation or Observation; (3) Test; (4) Field Notes; (5) Documentation

Results

Cycle I

Through the tests given at the end of this lesson, students' learning outcomes in cycle I were obtained. The tests given were in the form of short answers and essay tests with 15 questions and a working time of 25 minutes. This activity is carried out to determine the level of students' understanding and mastery of the previously discussed material. This test is also used to measure the learning outcomes of cognitive aspects (knowledge). Learning in the first cycle has not been successful and must be continued to the next cycle as an improvement from the first cycle. Of the 17 students in class V, 12 students or 70.6% have achieved mastery learning, while 5 students or 29.4% have not achieved learning mastery. The average student learning outcomes in the first cycle was 76.9. From the study results, it can be seen that some fifth grade students still do not meet the minimum completeness criteria (KKM) specified for the temperature and heat sub-themes, which is 70.

Based on the reflection in the first cycle, the weaknesses that occur and must be improved in the second cycle are (1) the implementation is not organized, so some students ask questions about their assignments; (2) Less optimal learning preparation, so that learning time is reduced; (3) Do not use media that can attract students' interest, such as pictures during group work; (4) During the presentation activity, some students did not pay attention to the group of presenters and talked alone with their friends; (5) Lack of punishment or firmness given by the teacher if the classroom situation is

crowded and uncontrollable; (6) Lack of appreciation or praise given, especially for students who actively provide questions, comments, and opinions; (7) Student activities and learning outcomes are still very low and have not met the specified success criteria, namely 70%.

From some of these weaknesses and shortcomings, it can be said that the guided discovery learning model with the scientific approach applied to my cycle still has many shortcomings. Activities and student learning outcomes which are the main focus of the implementation of learning are still relatively low. These weaknesses and shortcomings are then used as researchers in planning to take corrective actions in the implementation of cycle II. It is hoped that the implementation of the actions in cycle II can overcome the weaknesses and shortcomings that occur in cycle I.

Cycle II

Through the tests given at the end of this lesson, students' learning outcomes in cycle II were obtained. The questions given are in the form of short entry tests and essays with a total of 15 questions with a processing time of 20 minutes. This activity is carried out to determine the level of students' understanding and mastery of the previously discussed material. This test is also used to measure the learning outcomes of cognitive aspects (knowledge). Of the 17 students in class V, 15 students or 88.2% have achieved complete learning, while 2 students or 11.8% have not achieved learning mastery. The classical success rate has reached more than 80% of the total number of students, namely 88.2%. This means that the learning in cycle II has been successful and does not need to be done in the next cycle. The average student learning outcomes in the second cycle is 84.2. From the results of this study, it can be concluded that most of the fifth grade students have met the minimum criteria (KKM) specified, namely 70. From the results of reflection II it is found that (1) the implementation of learning is quite regular and orderly; (2) The learning preparation that has been done is quite effective, so that not much time is wasted in learning activities; (3) The teacher has provided motivation and enthusiasm in learning activities, especially to find the right answers and direct students; (4) During the presentation activity, almost all students paid close attention to the group of presenters and were able to respond to the presentations of other students; (5) The use of media has been able to activate student activities; (6) Firmness is given by the teacher if the class situation is crowded and less controlled; (7) Student learning outcomes have reached the specified criteria, namely 70.

Discussion

Student learning outcomes in cycle I and cycle II were compared by looking at the differences and improvements that occurred between the two. It also determines the success or failure of the actions that have been implemented. Learning outcomes are obtained after students work on test questions at the end of each cycle.

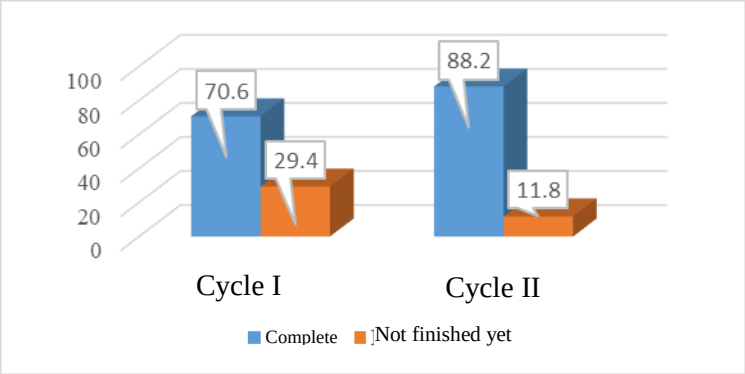

Figure 1 Comparison graph of student learning completeness cycle I and cycle II

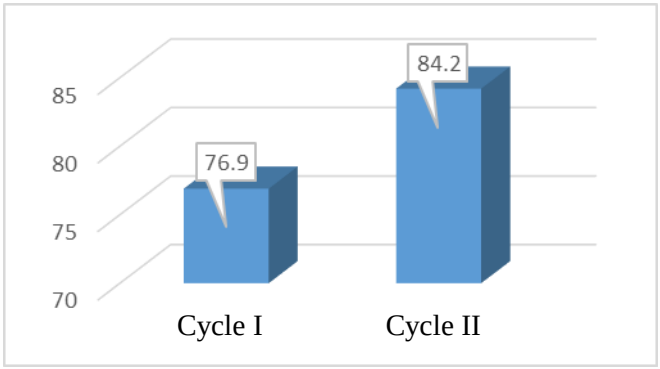

Figure 2 Comparison graph of the average value of students in cycle I and cycle II

Data on student learning activities were obtained from observations made by observers during learning activities. Observation of implementation from the implementation of pre-action to cycle II. The results of observing student learning activities in cycle I and cycle II were compared to see if there was a difference or improvement between the two. The magnitude of the increase in each of these aspects is different, students who read reading texts get 100% or 17 students in cycle I and cycle II, attention to teacher explanations increases from 14 (82.4%) to 15 (88.2%) , students' attention to the teacher's explanation increased from 14 (82.4%) to 15 (88.2%), students' enthusiasm in the learning process increased from 12 (70.6%) to 14 (82.4%), writing subject matter increased from 12 (70.6%) to 17 (100%), expressing opinions in their own words increased from 6 (35.3%) to 10 (58.8%), asking teachers increased from 8 (47, 1%) to 10 (58.8%), answering questions from the teacher increased from 9 (52.9%) to 11 (64.7%), participation in discussions increased from 11 (64.7%) to 15 (88 .2%), student interaction with other students increased from 12 (70.6%) to 14 (82.4%)), student-teacher interaction increased from 11 (64.7%) to 12 (70.6%). Draw/make a table according to the observation percentage 12 (70.6%) to 13 (76.5%), conclude based on observations from 11 (64.7%) to 12 (70.6%), and present learning outcomes increased from 8 (47.1%) to 12 (70.6%). The average student learning activity also increased from 11.6 (64.7%) in the first cycle to 13.2 (77.8%) in the second cycle.

Conclusion

Based on the results of research conducted in two cycles, data in the field shows that: The implementation of learning through guided discovery learning models uses a scientific approach to increase student activity and learning outcomes are carried out according to plan. The combination of the two learning models can increase student activity and learning outcomes. The atmosphere when learning is carried out can increase students' enthusiasm and confidence in the learning process. When learning takes place, students are more active than learning when the lecture method is applied. Learning through the guided discovery learning model using a scientific approach has increased in each cycle. Student learning activities between cycle I and cycle II have increased. The average student learning activity increased from 11.6 (64.7%) in the first cycle to 13.2 (77.8%) in the second cycle. In addition to learning activities, student learning outcomes also increase. The number of mastery learning increased from 12 students (70.6%) in the first cycle, and increased by 15 students (88.2%) in the second cycle. The average student learning outcomes also increased from 76.9 in the first cycle to 84.2 in the second cycle. The average increase in student learning outcomes between the initial data and cycle I was 7.2 and the average increase in student learning outcomes between cycle I and cycle II was 7.3.

Suggestion

Some research suggestions that can be given are: The application of the guided discovery learning model using a scientific approach can be used as a reference as well as a consideration in the use of learning methods to achieve learning objectives in schools. Schools need to provide supporting facilities in the application of the guided discovery learning model using a scientific approach to get

maximum results. The application of the guided discovery learning model using a scientific approach can be applied by teachers to various learning models and to improve student learning outcomes, with a note that preparation must be done carefully. In learning, the teacher is diligent in providing motivation and enthusiasm for students to be able to complete investigative tasks.

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