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Enhancing Students' Cognitive Learning Outcomes through the Implementation of the Discovery-Based Learning Model in Indonesian Language Instruction

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Abstract

The objective of this classroom action research is to determine the improvement in students' cognitive learning outcomes by using the Discovery Learning model in the Indonesian language curriculum for Grade 3 at SD 3 Kalianget during the 2020/2021 academic year. This group activity research employs both quantitative and qualitative methods. The study was conducted at SD 3 Kalianget with a sample size of 15 students. The classroom action research was carried out in three cycles. Data for this study were collected through online tests using Google Forms, observations, journals, and documents. The results indicated that the percentage of classical completeness and the average student scores in the first session of the first cycle were 46.67% and 66.67, respectively. The percentage of classical completeness and the average student scores in Cycles I and II were 66.67% and 71.67, respectively. The classical completeness rate and average student scores in Session I of Cycle II were between 60-70. The classical completeness rate and average student scores in Session II of Cycle II were between 73.33-76.67. The percentage of classical completeness and average student scores in the first session of Cycle III were 80% and 81.67, respectively. The percentage of classical completeness and the average student scores in the second session of Cycle III were 93.33% and 91.67, respectively

Keywords: Education; Cognitive; Discovery Learning

INTRODUCTION

Education is an essential means to enhance human resources. Essentially, education is a conscious effort aimed at developing an individual's cognitive, affective, and psychomotor abilities. These cognitive, affective, and psychomotor aspects not only influence the individual but also the environment in which they live. The global Covid-19 pandemic era in Indonesia required educational institutions to halt face-to-face learning practices. The cultural shift in classrooms due to the Covid-19 pandemic has impacted learning activities in general. In 2020, the Ministry of Education and Culture issued Circular No. 4, which regulates the procedures for conducting distance learning and counseling for domestic students. One of the digital platforms facilitating distance learning is Zoom meetings. Teachers and students use digital

platforms such as Zoom meetings to ensure that interactive learning, similar to face-to-face instruction, continues. Therefore, innovation in learning design for virtual education is necessary. Innovations can be implemented by applying learning models, methods, and approaches to core activities, which must first be tailored to the content of the learning and the characteristics of the students. Integrated thematic or thematic learning, scientific, inquiry-based, discovery-based, and project-based learning are some approaches and models that can be applied during learning activities. This aligns with the Ministry of Education and Culture Regulation No. 22 of 2026. In other words, the implementation of learning models in core functions becomes crucial in the context of delivering education.

One of the learning models outlined in the Ministry of Education and Culture Regulation No. 22 of 2026 is the discovery learning model. Discovery learning is a model that actively develops students' learning through self-discovery and self-inquiry, ensuring that the outcomes achieved are not easily forgotten and are remembered for a long time (Lestari, 2020:9). Saifuddin (in Kristin, 2016:91) defines the discovery learning model as a learning model aimed at stimulating students to observe, experiment, or conduct scientific actions in order to draw conclusions from the results of these scientific actions. Brunner, in Tinenti (2020:66), offers the idea of an exploratory learning model, which is considered efficient and effective in uncovering students' abilities. Based on the definitions proposed by these experts, the discovery learning model can be understood as a learning process that requires students to explore, investigate, and maximize their knowledge, attitudes, and skills by organizing scientific processes such as research, information sourcing, and observation to find solutions to the problems they face.

The literature review shows that several previous studies have examined the discovery learning model, such as the studies by Kristin (2016), Kristin and Rahayu (2016), and Setyaningsih, Dwiyanti, and Budiarti (2020). In her research, Kristin (2016) analyzed the discovery learning model to improve elementary school students' learning outcomes. While analyzing the discovery learning model, Kristin (2016) compared the results of several researchers who explored e-journals through Google Scholar and conducted document studies in libraries. The analysis results indicated that the discovery learning model could improve learning outcomes by an average of 17.8%, with a range from a minimum increase of 9% to a maximum of 27%. Kristin and Rahayu (2016) conducted a study on improving social studies learning outcomes for fourth-grade students using the discovery learning model. The results showed that the average social studies learning outcome in the experimental class was 82.08, whereas the average in the comparison class was 70.22. These findings indicate that the application of the discovery learning model positively affects the social studies learning outcomes of fourth-grade students at SD 3 Kalianget. In their research, Setyaningsih, Dwiyanti, and Budiarti (2020) successfully demonstrated an improvement in science learning outcomes using the discovery learning model. This improvement is reflected in the increased GPA and graduation rates from Period I (63.76 and 47.05%) to Period II (80.47 and 82.35%).

Observations of the learning activities of second-grade students at SD 1 Kalianget on Topics 6 and 7 before using the discovery learning model showed that the mastery of basic Indonesian language skills, including content related to the use of capital letters, punctuation marks (periods), and question marks, was still lacking. During home learning, activities were

mostly carried out independently, leading to some students not completing their tasks regularly. As a result, students' learning outcomes could not be optimally controlled. This significantly affected the cognitive learning outcomes of students when studying at home. The cognitive learning outcomes for the Indonesian language content in Theme 6 showed that the percentage of classical knowledge among students was still low at 44.44%, while the percentage of classical readiness among students in Theme 7 was 48.14%. Based on the observations of the learning activities and the literature review results, the researcher decided to use the discovery learning model to improve students' cognitive learning outcomes in the Indonesian language content.

The implementation of the discovery learning model in educational activities aims to: (1) Encourage students to participate and play an active role in learning; (2) motivate students to discover patterns in both concrete and abstract situations; (3) prompt students to formulate questioning methods; (4) assist students in developing cooperative and effective working methods with others; and (5) make learning with the discovery learning model perceived as more meaningful; and (6) facilitate the application of concepts, skills, and principles acquired by students during the learning process (Bell in Priansa, 2015:215). The objectives of applying the discovery learning model in educational activities align with the benefits of the discovery learning model as described by Suherman et al. and Lestari (2020:22-23). By applying the discovery learning model, students can actively participate in learning activities, gain a thorough understanding of the subjects, increase their sense of satisfaction from acquiring knowledge through self-discovery, transfer self-discovered knowledge to other contexts, and become more independent. The syntax of the discovery learning model, according to the Ministry of Education and Culture (2013), Kurinasih and Imas Berlin (Oktari and Desyandri, 2020:88), and Lestari (2020:38-40), is as follows: (1) providing a stimulus; (2) defining/identifying the problem; (3) collecting data; (4) processing data; (5) authentication; and (6) drawing conclusions/generalizations.

This research focuses on improving students' cognitive learning outcomes (understanding) using the discovery learning model, specifically for Indonesian language content on Topic 8. This specificity distinguishes this study from previous research used as references for this study. Purwanto (in Hutauruk and Simbolon, 2018:123) explains that learning outcomes are behavioral changes that occur after completing learning in accordance with educational objectives. Prasasti et al. (2019:175) consider learning outcomes as the achievement of educational goals attained by students after completing learning activities within a specified period. Sudyana (2014:22) describes learning outcomes as the skills possessed by students after receiving instruction. Anggraini (in Prananda & Hadiyanto, 2019:910) defines learning outcomes as changes in student behavior based on their experiences interacting with the environment. From the explanations provided by these experts, it can be concluded that learning outcomes are the result of changes in learning competencies achieved by students after undergoing instruction and successfully mastering the subject matter. These changes not only involve improvements in thinking skills but also enhancements in skills and attitudes to a higher level. The success of teachers in applying learning models significantly affects students' thinking abilities, which broadly impact students' learning outcomes. Learning

can be considered successful if students can achieve optimal learning outcomes based on the knowledge they have built and acquired.

This research is conducted to address the challenges faced in virtual learning. Based on the low percentage of cognitive learning outcomes in the Indonesian language content, this study aims to improve students' cognitive learning outcomes in Indonesian language content at SD 3 Kalianget Grade 2 through the discovery learning model.

METHOD

This research constitutes classroom action research. Suharjono (2019:124) developed the concept of classroom action research as research conducted by teachers to enhance the quality of classroom teaching practices. Kasihani (in Suprayitno, 2020:59) argues that classroom action research is a practical study aimed at correcting deficiencies in classroom learning through action. Suyanto (in Ni'mah, 2017:3) interprets classroom action research as practical research conducted to improve classroom learning through inquiry activities. The essence of Classroom Action Research (CAR), drawn from the insights of scholars, implies teachers' activities to enhance the quality of teaching practices based on classroom experiences or learning conditions and to assess the impact of these improvement efforts. This classroom action research employs the Kemmis and Taggart model.

The study is conducted in three cycles, with each cycle consisting of two sessions. Each session is conducted in four phases of classroom action research. According to Arikunto (2019:42), Subjantoro (2019:23), and Supardi (2019:210), the four phases of educational research are planning, action, observation, and reflection. The subjects of this research are 15 students from class 2A of SD Negeri Wonotingal Semarang. Data collection techniques in classroom action research include test and non-test techniques. The researcher utilizes objective test forms consisting of multiple-choice questions presented through the Google Forms platform. The purpose of this test is to enhance understanding of the learning material "Basic Competence of Indonesian Language 3.10" by focusing on the use of capital letters (names of God, people, religions) and periods and question marks to form correct sentences. Assessment techniques not yet proven are conducted through teacher observation, student observation, journals (field notes), and documentation.

Sanjaya (2017:92) states that data analysis is a process of processing and interpreting data with the aim of compiling various information according to its purpose in a meaningful and clear manner aligned with the research objectives. Data analysis in classroom action research (CAR) can be conducted using both quantitative and qualitative data analysis techniques. Quantitative data is generated from the description of student grade percentages, which are averaged and used to determine individual success or achievement according to classical objectives. To analyze improvement and conversion, students receive evaluations in the form of test questions in each section of the Google Form at every meeting. The qualitative data for this research comes from student observations, teacher skill observations, and journal entries, which are then combined with quantitative data as a basis for describing the growth of students' cognitive learning outcomes using the discovery learning model in Indonesian language content.

FINDINGS AND DISCUSSIONS

This classroom action research was conducted on Topic 8 "Home and Travel Safety", Subtopic 1 "Home Safety Rules", and Subtopic 2 "Maintaining Home Safety" during the academic year 2020/2021. The purpose of this classroom action research was to assess the growth of students' cognitive learning outcomes using the discovery learning model for Indonesian language instruction. Grade 2, Topic 8, Indonesian language competency standards used were CD 3.10 "Observe the use of capital letters (names of gods, people, religions) and periods and question marks in correct sentences." Cognitive learning outcomes for Indonesian language content in Grade 2, Topic 8, were considered to have improved classically when the classical mastery level was ≥ 75 and the average score of learning outcomes was ≥ 75. Students' cognitive learning outcomes were deemed proficient if their cognitive evaluation results reached the Minimum Mastery Criteria for SD 3 Kalianget, which is set at 75.

The percentage of students studying Indonesian language content in preschool conditions indicates a relatively low mastery rate. The pre-cycle mastery percentage based on cognitive learning outcomes in Themes 6 and 7 was 44.44% and 48.14%, respectively. The low mastery percentage of students' learning outcomes in Indonesian language content was then addressed by conducting classroom action research in three cycles, with each cycle comprising two meetings. Before completing Step I, II, and III, the researcher first developed a plan in accordance with the Kemmis and Tagart research plan. In the planning stage, the researcher prepared a lesson implementation plan, learning environment, teaching materials, learning materials, assessment tools, observation tools, and virtual meeting links through Zoom meetings.

The next stage is the implementation or action stage. Learning activities are carried out during the implementation or operational stage. Each cycle is conducted in two meetings, where each meeting is practically conducted via the Zoom meeting platform by applying the discovery learning model in the learning process. At the end of the activity phase, students receive an assessment link through Google Forms, which can be used to assess students' cognitive learning outcomes. After that, the researcher observes the progress of students' learning outcomes in each meeting during one cycle. The final step is to consider that if students' cognitive learning outcomes have not improved, then adjustments will be made, and if students' cognitive learning outcomes have improved, then the learning process will conclude. Below is the visualization recapitulation of the classic mastery percentage of students from Cycle I to Cycle III.

Table 1. Recapitulation of Classical Mastery Percentage from Cycle I to Cycle III

	Meeting I		**Meeting II**	
Cycle	Percentage of Completion	Percentage of Failure	Percentage of Completion	Percentage of Failure
Cycle I	46,67	53,33	66,67	33,33
Cycle II	60	40	73,33	26,37
Cycle III	80	20	93,33	6,67

Table 1 shows that the classical mastery percentage of students in cognitive aspects of Indonesian language learning consistently increases in each period. In the first and second

cycles, the classical mastery level of Indonesian language learning materials did not reach the expected level of 75%. The classical mastery percentage in Cycle I Encounter I was 46.67, while the mastery percentage was 53.33. The classical mastery percentage in Cycle I Encounter II was 66.67, with an incompleteness percentage of 26.33. The mastery percentage in Cycle II Encounter I was 60, while the incomplete percentage was 40. The classical mastery percentages in Cycles II and III were 73.67 and 26.33, respectively. In the third period, the classical mastery percentage aligned with the expected classical mastery percentage, reaching more than 75%. The classical mastery percentage in Cycle III Encounter I was 80, while the incomplete percentage was 20. The classical mastery percentage in Encounter II of Cycle III was 93.33, with an incomplete percentage of 6.67.

The improvement in students' cognitive learning outcomes in Indonesian language content is reflected not only in the classical mastery percentage of students in each period but also in the average cognitive learning outcomes from Cycle I Encounter I to Cycle I Encounter III. Here is an overview of the average cognitive learning outcomes of students.

Table 2. Recapitulation of Average Learning Outcomes from Cycle I to III

Cycle	Meeting I	Meeting II	Meeting III
Cycle I	66,67	71,67	69,17
Cycle II	70	76,67	73,34
Cycle III	81,67	91,67	86,67

Table 2 shows that the average learning outcomes of students in Indonesian language content in terms of cognitive aspects consistently improve in each cycle. The average scores of students in the cognitive aspect of Indonesian language content in Cycle I were still relatively low. This is because the average scores in Cycle I Encounter I and Cycle I Encounter II were still below the Minimum Mastery Criteria (MMC), which is less than 75. Cycle I Encounter I had an average score of 66.67, while Cycle I Encounter II had an average score of 71.67. Thus, the average cycle score for the first period was 69.17. Additionally, the average scores of students in the cognitive aspect of Indonesian language content in Cycle II were still relatively low but showed improvement. The average score for the first meeting of the second period was 70, while the average score for the second meeting of the second period was 76.67. Therefore, the average score for Cycle II was 69.17. The average scores of students in the cognitive aspect of Indonesian language content in Cycle III showed significant improvement. The average scores for Cycle III Encounter I and Cycle III Encounter II exceeded the Minimum Mastery Criteria (MMC) of more than 75. The average score for Cycle III Encounter I was 81.67, while the average score for Cycle III Encounter II was 91.67. Thus, the average score for Cycle III per cycle was 86.67.

From the information obtained from the meetings of Cycle I to the second round, it can be concluded that the cognitive learning outcomes of second-grade students increased in Indonesian language learning content Topic 8 using the discovery learning model. This is consistent with previous research by Kristin (2016), Kristin & Rahayu (2016), and Setyaningsih, Dwiyanti, and Budiart (2020), which found that the discovery learning model can improve student learning outcomes. This study focuses on improving cognitive learning outcomes, thus further literature review is needed as a reference to support the development of

other learning outcomes, such as affective and psychomotor aspects, to ascertain them. This research intuitively can serve as a reference for teachers or other researchers to design innovative learning to enhance the quality of schooling and students' cognitive processes.

KESIMPULAN

Based on the classroom engagement survey results, it is evident that the classical readiness percentage and average student scores increased in each cycle conducted. Significant progress in learning outcomes occurred in Sessions I and II of Cycle III, with classical mastery percentages exceeding 75% and average student scores exceeding 75. Activities in each cycle of this action research were conducted practically through the Zoom meeting platform, yet it did not diminish the essence of the discovery learning model in enhancing students' cognitive learning outcomes. The conclusion drawn from this study is that students' cognitive learning outcomes improved due to the implementation of the discovery learning model in Indonesian language learning content. Class 2, Subject 8, SD 3 Kalianget. Suggestions for future researchers include positioning the role of the teacher more as a supporter and motivator in enhancing students' cognitive learning outcomes with the discovery learning model. This is because the discovery-based learning model requires students to discover their own ideas or understanding of the material to make learning more meaningful.

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