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Improving Social Science Learning Outcomes through the Application of the Discovery Learning Model with e-LKPD Media for Grade IV Elementary School Students

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Abstrack
This research aims to improve the learning outcomes of Natural and Social Sciences students of grade IV C Sekolah Dasar Negeri 1 Bakalan Krajan Malang through the application of the Discovery Learning model assisted by e-LKPD media. The background of this study is the low learning outcomes and limited student engagement in IPAS learning, which is partly caused by conventional learning models and the absence of interactive digital teaching materials. This class action research was carried out in two cycles following the Kemmis and McTaggart model, each consisting of planning, implementation, observation, and reflection stages. In cycle I, learning was conducted using the Discovery Learning model without integrating e-LKPD media, while in cycle II, the learning process was supplemented with the use of interactive e-LKPD, designed to guide students in discovery activities, problem-solving, and critical thinking tasks. The research subjects involved 28 students of grade IV C. Data collection was carried out through learning outcome evaluation tests conducted at the end of each cycle. The results of the study showed a significant increase in learning completeness, from 58% in the first cycle to 89% in the second cycle, indicating a 31% improvement. These findings prove that the application of the Discovery Learning model assisted by e-LKPD media is effective not only in enhancing students' learning outcomes in Natural and Social Sciences but also in increasing active student participation, engagement, and motivation during the learning process.

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Introduction

In the 21st century era, education is required to be able to prepare students with digital literacy skills, critical thinking, collaboration, and creativity to face global competition and the challenges of the digital era (UNESCO, 2022). The Organization for Economic Co-operation and Development (OECD, 2020) emphasizes the importance of mastery of scientific reasoning and problem-solving skills as key competencies in the modern education system. In line with that, the World Economic Forum (2020) predicts that critical thinking, analytical, and the use of digital technology skills will become basic needs in the world of work in the future. Therefore, the transformation of learning in elementary schools is very important to prepare students to face these demands from an early age. One of the relevant strategies is through strengthening discovery-based learning (Discovery Learning) supported by interactive digital media.

In Indonesia, efforts to improve the quality of education continue to be carried out through the implementation of the Independent Curriculum which emphasizes competency-based, contextual, and digital technology learning (Ministry of Education and Culture, 2022). However, the results of the 2022 National Assessment show that the science literacy achievement of elementary school students in Indonesia is still in the basic category, with many students having difficulty understanding the concept of science based on data and real context (Center for Education Assessment, 2022). A similar condition also occurred at Bakalan Krajan 1 Public Elementary School Malang, where the results of initial observations showed that IPAS learning was still dominated by lecture methods, so that students tended to be passive and less enthusiastic about following lessons. The lack of involvement of students leads to low understanding of concepts and learning outcomes. Based on the results of the pre-research evaluation, the average score of class IV Natural and Social Sciences only reached 64.2, with a classical completeness rate of 48%, far below the minimum completeness standard (SKM) set at 75. This is in line with the findings of Permana et al. (2020) who stated that the lack of student activity in the learning process is one of the main factors causing low learning outcomes in elementary school.

Various previous studies have proven that the Discovery Learning model is effective in improving students' learning outcomes and critical thinking skills (Siregar et al., 2021; Basuki, 2023). The use of digital media such as E-LKPD has also been proven to encourage students to learn interactively and flexibly according to their learning style (Hidayah et al., 2020). However, most of the research is still partial, focusing only on the application of Discovery Learning without digital media optimization, or vice versa. Until now, there have not been many studies that specifically integrate the E-LKPD-assisted Discovery Learning model in social studies learning in elementary schools, even though the Independent Curriculum has integrated science and social studies into science subjects that emphasize exploration skills, critical thinking, and problem-solving based on real context (Ministry of Education and Culture, 2022). This gap is the reason for the importance of this research.

This research aims to improve the learning outcomes of Natural and Social Sciences students in grade IV of Bakalan Krajan 1 Public Elementary School Malang through the application of the Discovery Learning model assisted by E-LKPD media. In addition, this study also aims to determine the effectiveness of the combination of the Discovery Learning model and interactive digital media in encouraging active involvement of students during the learning

process. It is hoped that the Natural and Social Sciences learning process can be more interactive, fun, and meaningful for students, as well as a reference for the development of discovery-based active learning in the digital era.

Method

This type of research is Classroom Action Research with the Kemmis and McTaggart model which consists of planning, action implementation, observation, and reflection, chosen because it allows continuous improvement of learning practices in the classroom. The research was carried out at Bakalan Krajan 1 Public Elementary School Malang in the even semester of the 2024/2025 school year, precisely from February to March 2025, with 28 students in class IV C who were selected purposively because the previous Natural and Social Sciences learning results had not reached the Minimum Completeness Criteria evenly. The research instruments include learning outcome tests in the form of 10 multiple-choice questions and 3 description questions, observation sheets of student activities that contain five indicators, namely the activeness of questioning, the activeness of answering, discussion participation, involvement in using e-LKPD, and the ability to conclude the results of discoveries with a score scale of 1-4, as well as documentation in the form of photos, field notes, and the results of students' work in e-LKPD. The validity of the instrument was tested through content validation by two elementary education lecturers and one partner teacher, with the results of all question items and observation indicators declared valid with an Aiken's V score of 0.88, and the trial in parallel class IV resulted in a test reliability of 0.79 (high category). The research procedure consisted of a pre-cycle stage for problem identification through observation and interviews with classroom teachers, followed by two action cycles of two meetings each (2 × 35 minutes), where cycle I focused on the implementation of Discovery Learning without e-LKPD media and cycle II with the optimization of interactive e-LKPD media. Quantitative data from test results were analyzed using average scores and percentage of learning completeness ($P = n/N \times 100\%$), while qualitative data from observation and documentation were analyzed through data reduction, data presentation, and conclusion drawn, accompanied by triangulation between instruments to maintain data validity. The entire research process is carried out by paying attention to educational research ethics, namely obtaining written permission from the principal, the consent of the class teacher, and the delivery of oral information to students about the purpose of the activity without including personal identity in the reporting of the results.

Results and Discussion

Result

This research was carried out in two cycles, each consisting of stages of planning, implementation, observation, and reflection. The data collected included the results of formative tests, observation of student activities, and documentation of Natural and Social Sciences learning using the Discovery Learning model. Learning outcome tests are given at the end of each cycle to determine the achievement of learning objectives.

Results of Cycle I

In the first cycle, the implementation of learning uses the Discovery Learning model without E-LKPD media. The test results showed an average score of 65 students with a classical

completeness percentage of 58%. A total of 16 students achieved a score of ≥ 75, while 13 students have not completed it. Observation of activities showed that some students were less active in group discussions and had difficulties in the stages of data processing and drawing conclusions.

Table 1. Recapitulation of Cycle Learning Outcomes

Number	Grade Point Average	Conclusion	Incomplete	Classical Completeness
1	65	16 (58%)	13 (42%)	Incomplete

Results of Cycle II

In cycle II, the action was corrected by adding interactive E-LKPD media in Discovery Learning learning. The test results at the end of cycle II showed an increase in the average score to 80, with a classical completion percentage of 89%. A total of 25 students achieved a score of ≥ 75, while 3 students have not completed it. Observation of activities showed an increase in student activity, especially during group discussions and processing data through E-LKPD.

Table 2. Recapitulation of Learning Outcomes Cycle II

Number	Grade Point Average	Conclusion	Incomplete	Classical Completeness
1	80	25 (89%)	3 (11%)	Conclusion

Comparative Results Comparison Recapitulation Between Cycles

Table 3. Recapitulation of Learning Outcomes of Cycles I and II

Number	Cycle	Grade Point Average	Conclusion	Incomplete	Classical Completeness
1	Cycle I	65	16 (58%)	13 (42%)	Incomplete
2	Cycle II	80	25 (89%)	3 (11%)	Conclusion

The observation results showed that in cycle I students were still passive in several stages of Discovery Learning, while in cycle II there was an increase in active involvement, especially in group discussion activities and data processing through E-LKPD.

Discussion

The results of the study show that the application of the Discovery Learning model is gradually able to improve students' learning outcomes in science subjects. In cycle I, although the Discovery Learning approach has been implemented, student involvement is still limited and classical completeness has not been achieved. This condition is suspected because students are not familiar with the stages of Discovery Learning such as problem identification, data collection, and information processing independently.

A significant increase in the second cycle after the integration of multimedia-based E-LKPD shows that interactive digital media is effective in supporting the implementation of Discovery Learning. E-LKPD, which is equipped with images, videos, and interactive questions, facilitates the process of exploring concepts in a more interesting and structured way. These findings reinforce the opinion of Bruner (1961) that learning through discovery can strengthen concept retention and improve student understanding.

Theoretically, the results of this study are also supported by the findings of Basuki (2023) who stated that Discovery Learning improves students' activities and concept understanding. Hidayah et al. (2020) added that multimedia-based E-LKPD encourages student involvement more optimally than conventional LKPD. In addition, Masnil (2024) emphasized that Discovery Learning encourages students to think critically, and Ubaidah (2024) stated that the integration of digital media in Discovery Learning has a positive impact on Natural and Social Sciences learning outcomes.

Interestingly, there are 3 students who have not reached completion in cycle II. This shows that although in general E-LKPD-based Discovery Learning is effective, there are internal factors such as low motivation and difficulty adapting to digital media that affect learning outcomes. This is in line with the findings of Permana et al. (2020) that learning outcomes are influenced by internal (motivation, interest, learning readiness) and external factors (media, environment, methods).

This research has several limitations. First, the research was only conducted in one class with a limited number of students, so the generalization of the results still needs to be tested in a broader context. Second, the relatively short implementation time (two cycles) has not made it possible to measure the durability (retention) of students' learning outcomes over a longer period of time. Third, the study has not conducted an in-depth analysis of the influence of individual factors such as students' learning styles and digital skills that may contribute to learning outcomes.

Practically, the results of this study provide guidance for teachers in designing Discovery Learning-based Natural and Social Sciences learning with the support of interactive digital media. Teachers are advised to prepare a varied E-LKPD, containing visuals, videos, and interactive questions that are able to facilitate the active exploration of concepts by students. In addition, teachers need to ensure that students understand the flow of the Discovery Learning stages before learning begins, so that the learning process runs more effectively.

In addition, teachers should also identify from the beginning students who experience obstacles in participating in the digital media-based learning process, both due to limited learning motivation and technological adaptability. For students who have not achieved learning completeness, teachers need to provide special assistance and implement learning differentiation strategies as needed. No less important, teachers are advised to reflect on learning at the end of each stage of Discovery Learning, to ensure that all students understand the concepts learned and are able to relate the results of their discoveries to the concepts targeted in learning.

Conclusion

This research aims to improve the learning outcomes of social studies of grade IV students through the application of the Discovery Learning model assisted by E-LKPD media. Based on the results of class actions carried out over two cycles, it was concluded that the application of the Discovery Learning model with the support of E-LKPD media was effective in improving learning outcomes and student activities. This model encourages students to be more active in asking questions, discussing, deducing information, and exploring material independently, while E-LKPD media plays an important role in facilitating the concept discovery process through interactive, visual, and interesting questions. Theoretically, this study

strengthens the effectiveness of Discovery Learning in learning science in elementary schools, especially when supported by simple digital media that is in accordance with the characteristics of students. Practically, the results of this study provide an alternative discovery-based active learning strategy that is relevant to the principles of the Independent Curriculum, as well as a reference for teachers in designing more participatory, contextual, and technology-based science learning. For further development, it is suggested that similar research be applied to other science materials and different grade levels, and equipped with measurements of the durability of learning outcomes over a longer period of time to obtain a more comprehensive picture of the effectiveness of digital media-based Discovery Learning in elementary schools. In addition, it is recommended that there be a teacher training program related to the development and use of interactive E-LKPD in various subjects, as well as the development of other learning digital media that are in accordance with the characteristics and needs of students in the current digital era.

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Authors' Note

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