

Pop Up Media-Assisted Discovery Learning Model to Improve Elementary School Students' Collaboration Skills

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Article History

Received : 8 Juni 2025;

Revised : 13 July 2025;

Accepted: 8 August 2025.

Keywords

Discovery Learning,
Media Pop Up,
Collaboration Skills,
Primary School.



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Abstract

The low participation of students in group work, lack of ability to work together, and lack of mutual respect when completing joint tasks are problems in collaboration skills in grade IV of Bakalan Krajan 2 Public Elementary School, Malang City. This study aims to describe the application of the Discovery Learning learning model assisted by pop up interactive media in developing students' collaboration skills. The research subjects amounted to 29 students in grade IV, with data collected through observation using the rubric of assessment of collaboration skills, then analyzed quantitatively and qualitatively. The results showed an increase in students' collaboration skills by 21%, from an average of 58% in cycle I to 79% in cycle II. These findings show the potential effectiveness of the application of the Discovery Learning model assisted by pop up media in encouraging students to be more active, able to work together, and show mutual respect when completing group assignments. In addition to making a practical contribution to the development of invention-based learning practices in elementary schools, this study also adds references on the use of simple interactive media in improving collaboration skills. However, the results of this study are still limited to the context of one class and two learning cycles, so further studies with a wider scope of subjects, materials, and time are needed to test the sustainability of the impact of the intervention.

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How to Cite : Sesanti, N. R., Ni'ama, S., & Harini, Y. S. (2025). Pop Up Media-Assisted Discovery Learning Model to Improve Elementary School Students' Collaboration Skills. *Lucerna : Jurnal Riset Pendidikan Dan Pembelajaran*, 5(1), 20-28.
<https://doi.org/10.56393/lucerna.v5i1.3287>



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Introduction

The 21st century demands that learners have essential skills, including collaboration skills, to face increasingly complex global challenges. According to the World Economic Forum (2020), the ability to work together in a team, effective communication, and collaborative problem-solving are among the ten most in-demand skills in the world of work this century. The OECD report (2023) also emphasizes that basic education must provide space for students to develop social skills such as cooperation and collaboration from an early age so that they are ready to participate in the global community.

In Indonesia, collaboration skills are one of the competencies listed in the Pancasila Student Profile initiated by the Ministry of Education, Culture, Research, and Technology (Ministry of Education and Culture, 2022). Unfortunately, in the field, not all basic education units are able to realize collaborative learning optimally. One example occurred at Bakalan Krajan 2 Public Elementary School, Malang City, where grade IV students showed low participation in group work. This condition is characterized by the dominance of one or two students in discussions, the lack of interaction between group members, and a low sense of responsibility for joint tasks (Precycle Observation, 2024).

This problem is exacerbated by the learning approach that is still dominated by lecture methods and individual assignments. Teachers rarely leverage innovative learning models that emphasize active engagement and social interaction between learners. As a result, collaboration skills that should have been formed since elementary school are less developed, especially in Indonesian learning which requires discussion, reading together, and group presentations (Putri & Arifin, 2020). This condition has an impact on low communication skills, mutual respect, and the ability to share students' responsibilities in completing tasks together.

Several previous studies have shown the effectiveness of visual and interactive learning media in improving students' social skills. Utami and Harun (2017) found that interactive pop-up media is able to increase student participation through attractive visual displays. In addition, Wulandari et al. (2019) prove that interactive visual media can stimulate discussion and cooperation activities in thematic learning. Mulyani and Rohendi (2018) added that pop-up media provides space for students to collaborate in exploring the content of the material in groups. Zaini (2015) also showed that the discovery learning model is effective in encouraging students to actively explore new knowledge through group discussions. However, there have not been many studies that integrate interactive pop-up media with discovery learning in the context of Indonesian learning to improve the collaboration skills of elementary school students.

Although pop-up media has been shown to be effective in thematic learning and improving students' social aspects, research that specifically examines the use of

interactive pop-up media in the context of the discovery learning model in Indonesian learning in elementary schools is still very limited. Hasanah and Suprpto (2020) did report the success of pop-up media in increasing student cooperation, but have not examined its integration with discovery learning. Therefore, this research is important to fill the literature gap related to interactive media-based collaborative learning strategies in Indonesian language learning.

This research is expected to make a theoretical and practical contribution. Theoretically, the results of the study could enrich references on the integration of pop-up interactive media with discovery learning in the development of 21st century social skills in elementary schools. Practically, this research can be an alternative for teachers to design Indonesian learning that is collaborative, fun, and meaningful, while stimulating students' communication skills, responsibility, and cooperation in the lower grades (Ministry of Education and Culture, 2022; OECD, 2023).

Based on this background, this study aims to describe the process and results of the application of the discovery learning model assisted by pop-up interactive media in improving the collaboration skills of grade IV students of Bakalan Krajan 2 Public Elementary School, Malang City.

Method

This research is a collaborative classroom action research (PTK) that aims to improve students' collaboration skills through the application of pop-up interactive media in the discovery learning model. The subjects of the study were 29 grade IV students at Bakalan Krajan 2 Public Elementary School, Malang City, held during May-June 2025 in two cycles, two meetings each. The action design follows the Kemmis and McTaggart model which includes the stages of planning, implementation, observation, and reflection, with the collaboration of the classroom teacher in the preparation of scenarios, learning implementation, observation, and evaluation of action results. The instruments used are observation guidelines, documentation, and rubrics on collaboration skills based on six 6C indicators (Huda, 2014), namely active participation, communication, responsibility, mutual respect, decision-making, and task completion, each of which is coded through observation of student activities during group discussions. The quantitative data analysis technique is carried out by calculating the percentage of actual score achievement to the maximum score, classified into the categories of excellent, good, adequate, and in need of guidance, while qualitative data is analyzed using the Miles and Huberman stages which include data reduction, presentation of data in tables and narratives, and drawing conclusions based on achievement patterns between indicators and between cycles. The research has obtained official permission from the principal and adheres to the ethical principles of basic education research, including the approval of voluntary participation and maintaining the confidentiality of students' identities.

Results and Discussion

Results

This classroom action research aims to find out the extent to which students' collaboration skills are improved through the application of a discovery learning model supported by pop up interactive media in grade IVB students of Bakalan Krajan 2 Public Elementary School, Malang City. The research carried out based on the plan that has been prepared produces data that is divided into two parts, namely data in the first cycle and the second cycle. The subjects of the study were all students of class IVB Bakalan Krajan 2 Public Elementary School, Malang City which amounted to 29 people.

Table 1. Results of the Average Recapitulation of the Overall Research

Collaboration Skills	Cycle			
	Cycle 1		Cycle 2	
	Meeting 1	Meeting 2	Meeting 1	Meeting 2
	1	2	1	2
Average	54	58	74	79
Presentase	54%	58%	74%	79%
Criterion	Enough	Enough	Good	Good

Table analysis shows a significant increase in the collaboration skills of grade IV students of Bakalan Krajan 2 Public Elementary School, Malang City from the cycle 1 and cycle 2 stages by applying pop up interactive media. Each cycle shows significant progress at each meeting. The following is an explanation of the results of the research in each cycle that has been carried out.

The implementation of cycle 1 was carried out in 2 meetings. Each meeting has a time allocation of 2 x 35 minutes. Collaboration skills data were obtained by conducting observations guided by the assessment rubric and then analyzed to find out the results of the research. The results obtained after conducting Indonesian learning cycle 1 by applying pop up interactive media can be seen in Table 3 below.

Table 2. Results of the First Cycle of Recapitulation

Meeting 1		Meeting 2	
Aspects	Description	Aspects	Description
Number of students	29	Number of students	29
Completed students	10 children	Completed students	15 children
Incomplete students	19 children	Incomplete students	14 children
Lowest value	40	Lowest value	50
Highest score	70	Highest score	75
Total value	1585	Total value	1690
Average	54 (54%)	Average	58 (58%)

Based on Table 3, it can be seen the achievement of collaboration skills obtained by students. The results of the analysis showed that at the first meeting, out of a total of 29 students, as many as 19 people were still in the category of needing guidance, while the other 10 students reached the sufficient category. At the second meeting, the number of students who obtained the category of needing guidance decreased to 14 students, and 15 students were in the sufficient category. In the first meeting, the average score of students' collaborative skills was 54, and in the second meeting it increased to 58. However, the average result in the first cycle still does not meet the set target, which is at least 71 with a good category. Based on the results of reflection on the implementation of cycle I which has not reached the target, the research is continued to cycle 2.

After reflection and continued in cycle 2 which consisted of two meetings, the results of the research were obtained listed in Table 4 below.

Table 3. Results of Cycle 2 Recapitulation

Meeting 1 Aspects	Description	Meeting 2 Aspects	Description
Number of students	29	Number of students	29
Completed students	19 children	Completed students	25 children
Incomplete students	10 children	Incomplete students	4 children
Lowest value	65	Lowest value	70
Highest score	80	Highest score	95
Total value	2165	Total value	2315
Average	74 (74%)	Average	79 (79%)

Based on the data in the table, it is clear that the results of students' speaking skills in cycle 2 are clearly visible. At the first meeting, the highest score achieved by the students was 80, while the lowest score was 65, with an average score of 74. Meanwhile, in the second meeting, the highest score reached 95 and the lowest score was 70, with an overall average of 79 which was included in the good category. Overall, the final results of the classroom action research with the application of pop up interactive media using the discovery learning model showed a learning completeness rate of 79%.

Discussion

This study shows that the application of the discovery learning model assisted by pop-up interactive media has a meaningful impact on practically improving the collaboration skills of grade IV students of Bakalan Krajan 2 Public Elementary School, Malang City. The average achievement of collaboration skills has increased from cycle I to cycle II, along with the increase in students' activeness in group work, sharing tasks, expressing opinions, and resolving differences constructively. This increase occurs because students are more interested and motivated when using pop-up media, which are visual and interactive, thus encouraging them to be actively involved in discussions

and group work. The discovery learning model also provides space for students to discover concepts through exploratory activities, discussions, and presentation of group results, according to the learning syntax applied. The assessment of collaboration skills was carried out based on indicator 6C (Huda, 2014) during group discussions, making pop-up media, and presentations.

The findings of this study are supported by several previous study results, such as the research of Nurhadi and Wulandari (2019) and Rahmawati and Yuliana (2020) which stated that story-based media and discovery learning are effective in increasing social interaction, cooperation, and a sense of responsibility for elementary school students. Pop-up media is able to provide an interesting learning atmosphere, thus encouraging students to be more active in collaborating and communicating in groups. Built collaboration skills also contribute to other 21st-century skills, such as critical thinking, communication, and group leadership. Through discussions and creating pop-ups together, students learn to respect differences of opinion, share ideas, and complete group tasks responsibly.

Although the results show a positive trend, there are several limitations that need to be observed. The effectiveness of this pop-up media is likely influenced by the novelty effect, namely the interest of students because the media is used for the first time in learning. In addition, because the observers in this study are teacher-researchers, the potential for subjectivity bias in the assessment of collaboration skills remains, even though it has used validated standard rubrics. Other limitations lie in logistical factors, such as the availability of pop-up materials that require additional time and cost, as well as the challenges of implementation in classrooms with large numbers of students or teachers who are less familiar with discovery learning methods. Therefore, further research is recommended to test the effectiveness of this model in the context of different classes, subjects, and levels, as well as to involve external observers to minimize potential bias.

Conclusion

The results of the study show that the application of pop-up interactive media shows potential effectiveness in improving the collaboration skills of grade IV students at Bakalan Krajan 2 Public Elementary School, Malang City. The increase can be seen from the change in the collaboration skill category which was originally quite good, with an average achievement of final completeness of 86%. This media encourages students to be more active in interacting, cooperating, being responsible, and involved in group communication, problem-solving, and decision-making. These findings contribute to learning practices in elementary schools, especially in showing that interactive pop-up media can be an alternative to a relevant collaborative-based learning strategy to build students' 21st century skills in Indonesian subjects. However, the study was limited to

the context of a single class and a specific time of implementation, so more extensive studies across different classes, levels, and other subjects were needed to test the consistency and generalization of the findings.

Acknowledgments

The author expresses his deepest gratitude to the Principal of Bakalan Krajan 2 Public Elementary School, Malang City, the teachers of grade IV, and all students of class IVB who have provided support, cooperation, and active participation during this research process. Without the involvement and enthusiasm of various parties, this research would not have been able to be carried out properly. Thank you also to the supervisor from PGRI Kanjuruhan University Malang for the very valuable direction, guidance, and input in the process of preparing this article. Hopefully the results of this research can provide benefits for the development of learning strategies in elementary schools, especially in improving students' collaboration skills through innovative and fun learning media.

Authors' Note

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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