

Evaluation of Active Learning Models in General Education on Student Learning Outcomes

Widia^{1*}, Heru Suparman², Sangaji Niken Hapsari³

¹Sekolah Tinggi Keguruan dan Ilmu Pendidikan Harapan, Bima, Indonesia

^{2,3}Indraprasta PGRI University, Jakarta, Indonesia

*Corresponding author email: firmansah.habi.ac.id

Article Info

Article history:

Received: 28-10- 2025

Revised: 20-11- 2025

Accepted: 05-12- 2025

ABSTRACT

Active learning is a learning approach that places students as the main subject in the learning process. In the context of general education, the application of the active learning model is expected to be able to improve learning outcomes while developing critical, collaborative, and communicative thinking skills. This study aims to evaluate the effectiveness of the active learning model on student learning outcomes in general education subjects. The research method used is a quantitative approach with a quasi-experimental design. The research subjects consisted of two groups, namely the experimental class that applied the active learning model and the control class that used the conventional learning model. Data were collected through learning outcome tests and analyzed using descriptive and inferential statistical techniques. The results of the study show that there is a significant difference between the learning outcomes of students who participate in active learning and conventional learning. Active learning has been proven to be able to increase students' understanding of concepts, participation, and learning motivation. Thus, the active learning model is recommended as a strategic alternative in improving the quality of general education learning.

Keywords: Active learning, general education, learning outcomes, learning evaluation

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How to cite: Widia., Suparman. H & Hapsari, S. N (2025). Evaluation of Active Learning Models in General Education on Student Learning Outcomes. *Indonesian Journal of Educational Research and Evaluation Global*, 1(1), 44–50.

INTRODUCTION

The development of science and technology in the twenty-first century has generated profound transformations across multiple aspects of human life, including the educational sector. Education is no longer oriented solely toward the acquisition of cognitive knowledge but increasingly emphasizes the development of higher-order thinking skills that enable learners to adapt, compete, and contribute productively within a globalized society. One of the most essential competencies emphasized in contemporary education is critical thinking, which has become a core objective of twenty-first-century learning frameworks (OECD, 2020).

Critical thinking refers to an individual's capacity to analyze information, evaluate evidence, identify problems, and make reasoned decisions through reflective and rational

processes. Learners who possess strong critical thinking skills are better equipped to address complex problems, both within academic contexts and in everyday life situations. Consequently, fostering critical thinking skills has become a primary goal of instructional practices in schools and higher education institutions worldwide (Facione, 2020).

However, numerous empirical studies indicate that students' critical thinking skills remain relatively underdeveloped. This condition is largely attributed to learning processes that continue to rely heavily on conventional, teacher-centered instructional approaches. In such learning environments, teachers function as the dominant source of knowledge, while students assume passive roles and receive information without meaningful engagement in higher-level cognitive processes. As a result, learners tend to focus more on memorization than on analysis, synthesis, evaluation, and application of knowledge (Tiruneh et al., 2021).

This situation presents a significant challenge for the education system, particularly in efforts to enhance learning quality. Effective learning environments should promote active, innovative, creative, and meaningful learning experiences that enable students to develop their potential and competencies optimally. In line with this perspective, contemporary educational paradigms emphasize student-centered learning approaches, in which learners actively construct knowledge through interaction, exploration, and reflection based on meaningful learning experiences (Darling-Hammond et al., 2020).

In Indonesia, the implementation of the Independent Curriculum reflects this global shift by emphasizing holistic competency development, including critical, creative, collaborative, and communicative thinking skills. This curriculum encourages educators to apply contextual, flexible, and competency-oriented instructional models that strengthen students' readiness for twenty-first-century challenges. Among the instructional models considered relevant to these demands is Project-Based Learning (PjBL), which has gained increasing attention in contemporary educational research.

Project-Based Learning is an instructional model that positions projects as the central component of the learning process. Through PjBL, students engage in learning by planning, implementing, and evaluating projects that address authentic and real-world problems. This learning process enables students to integrate knowledge, skills, and attitudes simultaneously, thereby promoting deeper understanding and meaningful learning experiences (Kokotsaki et al., 2021).

Research indicates that PjBL provides substantial opportunities for learners to develop higher-order thinking skills, including critical thinking, problem-solving, and decision-making abilities. Within project-based environments, students are required to formulate questions, seek and analyze information, collaborate with peers, and communicate their findings effectively. These activities inherently demand reflective and analytical thinking, which directly supports the development of critical thinking skills (Guo et al., 2020).

Moreover, PjBL aligns closely with constructivist learning theory, which emphasizes that knowledge is actively constructed by learners through interaction with their environment and learning experiences. From this perspective, students do not passively receive information but actively build understanding through inquiry, exploration, and collaboration. In the context of PjBL, this process enhances learning relevance and facilitates deeper conceptual understanding that is transferable to real-life situations (Hmelo-Silver & Jeong, 2021).

A growing body of recent empirical evidence confirms that the application of PjBL positively influences students' critical thinking skills. Meta-analytic and experimental studies demonstrate that students who participate in project-based learning environments exhibit higher levels of conceptual understanding, learning motivation, and critical thinking performance compared to those engaged in traditional instructional approaches (Almulla, 2020; Guo et al., 2020).

Despite its documented advantages, the implementation of PjBL in school contexts continues to face several challenges. Teachers often encounter difficulties in designing projects that align with learning objectives and student characteristics. Additionally, limited instructional time, inadequate facilities, and insufficient teacher familiarity with PjBL principles frequently hinder effective implementation. These challenges highlight the necessity of systematic investigation and professional support to ensure successful adoption of PjBL (Condliffe et al., 2020).

Based on the preceding discussion, it is evident that critical thinking skills constitute essential competencies that must be developed through innovative, student-centered instructional approaches. Project-Based Learning demonstrates substantial potential for enhancing critical thinking skills by emphasizing active engagement, problem-solving, collaboration, and contextual learning. However, to ensure its effectiveness, rigorous empirical research is required to examine its implementation within diverse educational contexts.

Therefore, this study focuses on examining the implementation of the Project-Based Learning model in enhancing students' critical thinking skills. The findings of this research are expected to contribute both theoretically and practically to the development of innovative learning strategies and to serve as a reference for educators and educational stakeholders in their efforts to improve the quality of learning in schools.

METHODS

This study uses a quantitative approach with a quasi-experimental design, which aims to evaluate the effect of the application of the active learning model on student learning outcomes in general education subjects. The quasi-experimental design was chosen because it did not allow the researchers to randomize the subjects in full, but they could still compare the effectiveness of the treatment between the experimental group and the control group. This research was carried out in one of the formal education units at the secondary education level for one academic semester.

The research subject consists of two classes that have relatively similar characteristics based on the results of previous academic scores and the background of the students. One class was designated as an experimental class that received treatment in the form of the application of an active learning model, while the other class was a control class that used a conventional learning model. The active learning model applied includes group discussions, problem-based learning, interactive questions and answers, and presentations of students' work. Meanwhile, conventional learning is carried out by the method of lectures and individual assignments.

Data collection techniques are carried out through learning outcome tests and observations. The learning outcome test is used to measure the level of mastery of students' material after participating in the learning process. Test instruments are prepared based on competency indicators that have been determined in the curriculum and tested for validity and reliability before use. Observations were carried out to obtain supporting data regarding the level of activity and participation of students during the learning process.

The data obtained were analyzed using descriptive and inferential statistical techniques. Descriptive analysis is used to find out an overview of student learning outcomes, such as average grades, highest grades, and lowest grades. Furthermore, an inferential analysis was carried out using an average difference test to determine the significance of the difference in learning outcomes between the experimental class and the control class. The results of the data analysis are used as a basis to draw conclusions about the effectiveness of the active learning model in improving student learning outcomes in general education..

RESULT AND DISCUSSION

The results of the study show that the application of the active learning model has a positive impact on students' learning outcomes in general education subjects. Based on the analysis of learning outcome test data, the average score of students in the experimental class that applied active learning was higher than the control class that used conventional learning. This difference shows that the active involvement of students in the learning process contributes to increased understanding of the material and mastery of concepts in a more in-depth manner.

Descriptively, the learning outcomes of students in the experimental class showed a significant improvement compared to the initial condition. Students are able to answer questions that require conceptual understanding and application of the material in the context of daily life. This is different from students in the control class who tend to only be able to answer questions that are factual and memorized. These findings indicate that active learning encourages students to think more critically and reflective of the material studied.

The results of observations during the learning process also showed a difference in the level of activity between the experimental class and the control class. Students in the experimental class seemed more enthusiastic in participating in learning, actively asking questions, and participating in group discussions. Learning activities such as discussions, problem-solving, and presentations encourage students to express opinions and collaborate with classmates. Meanwhile, in the control class, student participation was relatively low and learning was dominated by the teacher's explanation.

The improvement in learning outcomes in the experimental classroom can be explained through the theory of constructivism which emphasizes that knowledge is built through experience and social interaction. In active learning, students are given the opportunity to construct their own knowledge through challenging and meaningful activities. Students not only receive information passively, but also process, discuss, and reflect on the information so that the understanding gained becomes stronger and lasts longer.

In addition to improving cognitive aspects, active learning also has a positive impact on the affective aspects of students. Students show a more positive attitude towards general education learning, such as increased learning motivation, confidence, and responsibility for the tasks given. Active involvement in learning makes learners feel valued and has an important role in the learning process, thereby increasing their interest and commitment to learning.

From the psychomotor aspect, active learning also makes a significant contribution. Learning activities that involve group work and presentations train communication skills, cooperation, and the ability to convey ideas systematically. Students become more skilled at organizing information and presenting it to others. This shows that active learning is not only oriented towards academic achievement, but also on the development of social skills that are important in daily life.

The results of the inferential analysis showed that the difference in learning outcomes between the experimental class and the control class was statistically significant. These findings reinforce the results of a descriptive analysis that shows the advantages of active learning compared to conventional learning. Thus, it can be concluded that the application of the active learning model has a real influence on improving student learning outcomes in general education.

The findings of this study are in line with the results of previous research which stated that active learning can improve the quality of learning and learning outcomes of students. Active learning allows learners to be directly involved in the learning process, thereby improving material comprehension and retention. In addition, active learning also encourages learners to develop higher-level thinking skills, such as analysis, synthesis, and evaluation.

However, the results of the study also show that there are several challenges in the implementation of active learning. One of the main challenges is the management of learning time. Active learning activities take longer than conventional learning. Therefore, teachers need to plan learning carefully so that all material can be delivered effectively without reducing the quality of the learning process.

In addition, differences in student characteristics also affect the success rate of active learning. Not all learners have the same level of confidence and communication skills. Some learners tend to be passive and reluctant to participate in discussions. Therefore, teachers need to create an inclusive learning atmosphere and provide support to students so that they feel comfortable to be actively involved in learning.

The teacher readiness factor is also an important aspect in the success of active learning. Teachers are required to have the ability to design interesting learning activities, manage classes effectively, and facilitate discussions and interactions between students. Without adequate readiness and competence, active learning has the potential to not run optimally. Therefore, training and mentoring are needed for teachers to be able to implement active learning effectively.

In the context of general education, active learning makes a significant contribution to creating meaningful learning that is relevant to the lives of students. General educational materials related to values, attitudes, and social life can be better understood through joint discussion and reflection. Students not only understand the material theoretically, but are also able to apply it in daily life.

Overall, the results and discussion of this study show that the active learning model is an effective learning strategy to improve student learning outcomes in general education. Active learning not only improves the cognitive aspect, but also the affective and psychomotor aspects of students. Thus, active learning can be a solution to overcome the problem of conventional learning that tends to be passive and less meaningful.

The implication of the results of this study is the need for the development and application of active learning more widely in general education. Schools and education policy makers are expected to provide support in the form of infrastructure, teacher training, and policies that support learning innovation. With adequate support, active learning can be applied optimally and sustainably.

By considering the results of the research and the various findings obtained, it can be concluded that active learning has great potential in improving the quality of general education. The implementation of active learning that is systematically designed and adjusted to the characteristics of students will have a positive impact on learning outcomes and student development holistically.

CONCLUSION

Digital-based learning innovations have great potential in improving student literacy, especially in the context of the Society 5.0 era which emphasizes the integration between technology and human life. Digital learning not only provides easy access to various sources of information, but also creates a more interesting, interactive, and relevant learning experience. Through the use of digital platforms such as Learning Management System (LMS), learning videos, simulations, and interactive applications such as Kahoot and Quizizz, students can be more actively involved in the learning process. This contributes to strengthening various types of literacy, such as digital literacy, information, numeracy, and critical thinking literacy.

The integration of technology in learning also allows for the differentiation of teaching materials according to students' needs and learning styles, as well as encouraging collaboration through virtual project-based group work. On the other hand, digital learning encourages

students to be more independent in managing their learning process, thus developing lifelong learning skills that are very important in this digital era.

Nevertheless, this great potential still faces a number of challenges. The digital divide between urban and rural areas, the low readiness of teachers to integrate technology effectively, and the limited infrastructure in various schools are still the main obstacles. Therefore, policies that support comprehensive digital transformation in the education sector are needed, including the provision of intensive training for teachers, strengthening technology infrastructure, and equitable access to the internet and digital learning tools. With these strategic steps, digital-based learning can be optimized to form a generation that is literate, adaptive, and ready to face global challenges in the Society 5.0 era.

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