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Implementation of Project-Based Learning and Cooperative Learning Models of the ASSURE Type to Improve Students' Problem-Solving Skills and Learning Outcomes

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Abstract: Improving the quality of learning at various levels of education requires the implementation of models capable of developing higher-order thinking skills while improving learning outcomes. Project-Based Learning (PjBL) has proven effective in improving problem-solving skills in high school students, particularly in Physics learning on rectilinear motion. On the other hand, the ASSURE cooperative learning model has successfully improved elementary school students' learning outcomes through the stages of learning needs analysis, goal setting, strategy selection, active participation, and ongoing evaluation. This article aims to examine the potential of integrating PjBL and ASSURE as a comprehensive approach across educational levels to improve problem-solving skills and student learning outcomes. The methods used are literature review and synthesis of previous research results. The results of the study indicate that the PjBL–ASSURE integration is complementary: PjBL strengthens investigative activities and product creation, while ASSURE strengthens learning planning, media differentiation, and ongoing evaluation. The integration of the two has the potential to produce meaningful, adaptive, and contextual learning. Further research is recommended to empirically test this integrative model across various subjects and educational levels.

Kata kunci: Project-Based Learning; ASSURE; Learning Outcomes; Problem Solving; Learning Models.

Introduction

The challenges of 21st-century learning require students to master a set of higher-order thinking skills (HOTS), such as critical, creative, collaborative, and communicative thinking (Guartha, 2024; Nasution, 2024). These skills are not only an indicator of students' readiness to face the complexities of modern life, but are also the foundation for effective problem-solving abilities (Nasution, 2024; Sulistifa, 2025). However, various national and international reports show that the problem-solving abilities of students in Indonesia are still in the low category (Sriwahyuni & Maryati, 2022). This situation is further reinforced by observations of learning in various educational institutions, which show that learning practices are still dominated by lecture methods, memorization of material, and evaluations oriented toward basic cognitive achievement. This learning pattern does not fully challenge students to analyze, evaluate, and apply concepts in real-world situations.

In response to these problems, various studies recommend the use of student-centered learning models. One model that has proven effective is Project-Based Learning (PjBL), which emphasizes student engagement through investigative, collaborative activities and the creation of authentic products (Asy'arie et al., 2025; Junaid & Mukaddas, 2025; Widadi et al., 2025). The implementation of Project-Based Learning (PjBL), as demonstrated in a study at SMA

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Negeri 2 Mataram, has been shown to improve students' ability to analyze linear motion concepts and solve contextual problems. This success demonstrates that project-based learning provides students with the opportunity to explore real-world problems, make decisions, and generate creative solutions both independently and in groups.

Unlike high school, elementary school education is crucial because it is at this level that children's potential develops and serves as the initial foundation for learning abilities at the next level. Elementary school students are more sensitive and sharp in absorbing knowledge. Therefore, for optimal learning development in elementary school students, a quality learning process is necessary. Several factors influence the success of the learning process in elementary schools, namely teachers, students, the environment, and facilities and infrastructure. Efforts to improve the quality of education include improving the quality of human resources, namely teachers. Improving teachers' ability to deliver learning needs to be a separate focus. Teaching is not just about communicating knowledge; it also means transferring knowledge so that it can be understood and applied by students. This can be realized, among other things, by creating an active, innovative, creative, effective, and enjoyable learning environment. This can motivate students to actively ask questions and express ideas effectively and enthusiastically in participating in learning, which will impact the achievement of optimal learning outcomes (Febriyanti et al., 2021).

The Assure Learning Model is a learning design model for classroom-oriented teaching and learning activities (KBM) (Hardiyanti & Enramika, 2023). The Assure Model is a learning model that can be implemented in elementary, secondary, and higher education. This learning model can be used at various levels of education. It can be used for a variety of subjects, including social sciences, natural sciences, and others. According to Pribadi (2011:29) Assure is that this learning model is more oriented towards the use of materials, media and technology in creating the desired learning processes and activities (Muzakki et al., 2021). Utilizing the Assure learning design model requires a comprehensive, step-by-step approach to achieve optimal results, namely successful learning. The Assure learning model can be applied to design both individual and group learning activities. Angela (2011) explained that the Assure learning model is a logical and simple learning model. This is because the Assure model is a well-designed learning model that begins by capturing students' attention, stating the objectives to be met, presenting the material, engaging students in the learning process, assessing student understanding, providing feedback, and finally conducting an evaluation (Saputra & Purwanti, 2020).

Thus, research at SD Negeri 2 Manuru shows that the ASSURE-based cooperative learning model has a significant influence on improving learning outcomes (Kosilah & Septian, 2020). The ASSURE model offers a systematic learning planning framework, starting from analyzing student characteristics, setting goals, selecting and utilizing media, to evaluating learning (Salsabila & Ramli, 2025; Zamhariroh et al., 2025). This approach helps teachers design learning processes that are more effective, planned, and in accordance with students' learning needs, including the integration of technology and learning media.

Both models have complementary characteristics. PjBL is able to build 21st-century competencies through exploratory activities and project-based problem-solving (Fadli et al., 2024), while ASSURE provides structural guidance that strengthens the quality of planning, implementation, and evaluation of learning (Afifah et al., 2024). Thus, the integration of Project-Based Learning (PjBL) and ASSURE has the potential to produce a comprehensive learning strategy that not only encourages creativity and active student engagement, but also ensures that the learning process is planned, directed, and in accordance with the developmental needs of students. Therefore, this study aims to compile a scientific study on the integration of Project-Based Learning (PBL) and ASSURE models as an integrated learning strategy to improve learning outcomes and problem-solving skills of students at various levels of education. This study is expected to provide theoretical and practical contributions in the development of innovative learning designs that are adaptive to the demands of 21st-century learning.

Metode

This research uses a library research method, namely a research technique carried out through an in-depth study of various written sources that are relevant to the study topic (Sari & Asmendri, 2020). The researcher did not collect field data, but rather systematically reviewed the results of previous research, educational theories, and academic documents that support the integration of the Project-Based Learning (PjBL) model and the ASSURE type of cooperative learning model in improving problem-solving skills and learning outcomes.

The first stage of this research was data collection, which was conducted by compiling research articles, scientific reports, and SINTA-indexed publications that discussed the application of PjBL in Physics learning at the high school level, as well as research on the implementation of the ASSURE model in science

learning at the elementary school level. In addition, the researcher also collected theoretical sources regarding the constructivist approach, cooperative learning, and project-based learning, both from textbooks, reference books, and other academic documents. The second stage was data reduction, namely the process of selecting and filtering information from various sources to choose the most relevant parts to the research focus. At this stage, the researcher organized the information based on two main variables: problem-solving ability and student learning outcomes. Only information that had theoretical and empirical relevance was retained for further analysis.

The next stage is the synthesis of findings, which integrates the reduced research results with theoretical studies to examine the relationships, similarities, and potential synergies between the PjBL and ASSURE models. At this stage, the researcher analyzes how the two models can complement each other in learning planning, implementing learning activities, and evaluating learning outcomes. The final stage is drawing conclusions, which is carried out by compiling the study findings comprehensively to answer the research objectives. Conclusions are formulated based on the relationships between the components of the studied learning models, thus producing an overview of the potential integration of the PjBL and ASSURE models as an effective learning approach across educational levels.

Hasil dan Pembahasan

Project-Based Learning (PjBL) is a learning model that places students at the center of learning activities through direct involvement in completing projects that are real and relevant to their lives (Jannah et al., 2024). Project-based learning not only emphasizes mastery of theoretical concepts, but also encourages students to apply this knowledge in practical contexts that require analysis, creativity, and problem solving (Taliak et al., 2024; Widiawati et al., 2024). The main characteristics of PjBL include orientation towards authentic projects, integration of theoretical and practical concepts, collaborative work, and systematic and structured problem solving (Widiawati et al., 2024).

In the context of Physics learning at the high school level, various studies show that the application of PjBL is able to significantly improve students' problem-solving skills (Doyan et al., 2025). Through projects such as motion analysis using video, creating simple models, or designing tools based on the concept of linear motion, students are trained to formulate problems, collect and interpret data, and develop real solutions (Sutria et al., 2023). The results of the study on straight motion material showed that students who learned through PjBL had higher post-test scores for problem-solving skills compared to students who followed conventional learning.

The effectiveness of PjBL is primarily seen in the increased active engagement of students throughout the learning process. They do not merely passively receive information, but act as investigators, directly exploring physical phenomena (Azizah & Fauziah, 2023). Activities such as analyzing motion graphs, taking measurements, discussing in groups, and presenting project results also develop analytical and scientific communication skills (Agustina et al., 2024). Thus, PjBL has been proven to be able to create a more meaningful learning experience and is oriented towards developing high-level problem-solving skills.

Potential for PjBL–ASSURE Integration

The integration between the Project-Based Learning (PjBL) model and the ASSURE type of cooperative learning model offers great potential to create learning that is more comprehensive, adaptive, and oriented towards developing 21st century competencies (Hasyim, 2020; Kusnadi et al., 2023). These two models have different strengths but complement each other, so that when combined they can enrich students' learning experiences while increasing the effectiveness of the learning process (Retnaningsih et al., 2019). The ASSURE model provides a systematic learning planning framework. Through the stages of analyzing student characteristics, establishing learning objectives, selecting methods and media, and ongoing evaluation, teachers can design a more structured and tailored learning process (Nawawi, 2018). Meanwhile, PjBL provides an authentic learning dimension through student involvement in investigative activities and completion of real projects (Kurniasari et al., 2023). The combination of the two allows the learning process to take place with a clear flow while providing space for students to explore concepts in more depth.

In terms of developing high-level thinking skills, PjBL requires students to analyze contextual problems, design solutions, and work in groups to produce products (Kurniasari et al., 2023). In this integration, ASSURE plays a role in ensuring that all students have equal opportunities to be actively involved through varied and well-planned learning strategies, media, and activities (Iskandar & Farida, 2020; Stavinibelia et al., 2023). Thus, the combination of the two models not only encourages problem-solving skills, but also ensures that the collaboration process runs effectively.

Another potential integration lies in the use of media and technology. ASSURE explicitly emphasizes the selection and utilization of learning media, thereby strengthening the implementation of PjBL, which often

requires technological support, such as motion analysis videos, digital simulations, data presentation software, and presentation media (Fatimah & Bramastia, 2022). The appropriate use of technology can improve the quality of investigative activities, data accuracy, and the quality of project products produced by students (Alarcón et al., 2023; Benlaghrissi & Ouahidi, 2024). In terms of evaluation, the PjBL–ASSURE integration offers a more comprehensive approach. PjBL emphasizes process- and product-based assessment, while ASSURE strengthens objective assessment through evaluation of student participation, goal achievement, and lesson revision. The collaboration of these two models enables teachers to conduct more holistic and sustainable evaluations (V., 2018).

Furthermore, the integration of these two models is flexible and can be applied at various levels of education. At the elementary school level, the PjBL–ASSURE integration can be used through simple project activities supported by visual media, manipulatives, and small group work (Ariefiani et al., 2016). At the junior high and high school levels, learning can be expanded into more complex investigative projects, utilizing data analysis, experiments, and digital technologies. The integration of PjBL and ASSURE creates rich, varied, and relevant learning that meets the needs of modern learners (Lumbantoruan & Ditasona, 2021). This model not only ensures that learning is well-planned, but also provides space for students to think critically, collaborate, and produce real products that illustrate their understanding.

Kesimpulan

This study shows that the integration of the PjBL and ASSURE models has the potential to be an effective learning approach to improve problem-solving skills and student learning outcomes at various levels of education. PjBL provides opportunities for students to learn through real-world experiences and contextual problem-solving, while ASSURE ensures that the learning process is systematic, planned, and differentiated. The integration of the two results in more meaningful, active, creative learning that is in line with the demands of the 21st century. Further empirical research is recommended to test the effectiveness of the PjBL–ASSURE integrative model in various subjects.

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