

Development of A Science Learning Model Based on Project Based Learning (Pjbl) Integrated With Islamic Educational Values in Junior High Schools in Gowa Regency

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Abstract

Science learning at the junior high school level is not only required to develop scientific knowledge and skills but also needs to shape students' character and values. The results of the initial analysis at several junior high schools in Gowa Regency indicate that Project Based Learning (PjBL) has been implemented in science learning; however, the integration of Islamic educational values has not been systematically carried out at every stage of learning, reflection, and follow-up. Therefore, this study aims to develop a science learning model based on Project Based Learning integrated with Islamic educational values for junior high school students in Gowa Regency. This study employed a Research and Development (R&D) approach using the ADDIE development model, which comprises the stages of Analysis, Design, Development, Implementation, and Evaluation. The model development focused on the topic of Human Growth and Development for ninth-grade junior high school students. Research data were obtained through interviews, observations, questionnaires, validation sheets, documentation, and learning outcome tests. The quality of the developed model was assessed based on validity, practicality, and effectiveness. The research results produced a science learning model based on Project Based Learning integrated with Islamic educational values and supported by teaching materials, modules, student worksheets, learning tools, and assessment instruments. The model consists of seven stages, namely determining fundamental questions, designing project planning, developing a schedule, monitoring the project and investigation, testing or presenting the results, evaluating the experience, and reflection and follow-up. Islamic educational values, such as gratitude, trustworthiness, responsibility, discipline, honesty, cooperation, mutual respect, and caring, are operationally integrated into the learning process. The validation results obtained an average score of 4.20, categorized as good and feasible. The practicality of the model was demonstrated by a learning implementation score of 0.97, a teacher response of 97.50%, and a student response of 96.50%. The effectiveness test results showed that teachers' ability to manage learning obtained an average score of 4.60, while student activity reached 0.98, indicating a high level of engagement. Student learning outcomes increased, with the average pretest score rising from 63.63 to 88.06 on the posttest, and learning mastery reaching 100%. Thus, the science learning model based on Project Based Learning integrated with Islamic educational values meets the criteria of validity, practicality, and effectiveness. This model can serve as an alternative for implementing science learning that systematically integrates scientific knowledge, project-based learning experiences, and the internalization of Islamic educational values.

Keywords: Project Based Learning, science learning, Islamic educational values, learning model development, junior high school, ADDIE.

1 Introduction

Science learning at the junior high school level is not only oriented toward mastering concepts and scientific skills but also needs to provide active, contextual, collaborative, investigative, and reflective learning experiences. The science learning process should provide students with opportunities to construct knowledge through direct experiences, investigate various phenomena, communicate results, and reflect on their learning experiences. One approach relevant to these characteristics is Project Based Learning (PjBL), because project-based learning provides opportunities for students to become actively involved in designing, implementing, and evaluating a project.

Although PjBL has been used in science learning, its implementation has not fully addressed the need to develop learning that integrates knowledge, skills, and values in an integrated manner. The results of the needs analysis in this study indicate that science teachers in Gowa Regency have frequently implemented PjBL but still experience difficulties in integrating Islamic educational values into concrete and operational learning activities. Teachers also need examples of learning tools and clearer guidelines for teacher and student activities. In addition, reflection and follow-up activities have not been clearly structured in the learning process. These

conditions indicate the need for a model that can strengthen PjBL implementation while providing systematic guidance for integrating Islamic educational values.

The integration of Islamic educational values into science learning is important so that the learning process not only produces academic achievement but also supports the development of students' character. In this study, Islamic educational values are not positioned merely as additions in the form of moral messages or the inclusion of Qur'anic verses in learning materials but are operationalized through student activities at every phase of learning. The integrated values include gratitude, trustworthiness, responsibility, discipline, honesty, cooperation, mutual respect, and caring. This integration is realized through project activities, such as carrying out tasks responsibly, adhering to schedules, processing and reporting data honestly, cooperating, respecting opinions, and reflecting on learning experiences.

Based on these conditions, it is necessary to develop a science learning model that does not replace PjBL but strengthens its implementation through the systematic integration of Islamic educational values. The model developed in this study consists of seven phases, namely determining fundamental questions, designing project planning, developing a schedule, monitoring the project and investigation, testing or presenting the results, evaluating the experience, and reflection and follow-up. The addition of the reflection and follow-up phase is important because it provides students with opportunities to connect their understanding of science concepts, project experiences, investigation processes, social experiences, the internalization of Islamic educational values, and improvement actions after learning. Thus, learning does not stop at project completion and presentation of results but continues through a process of meaning-making and improvement.

Based on these needs, this study focuses on developing a science learning model based on Project Based Learning (PjBL) integrated with Islamic educational values for ninth-grade junior high school students in Gowa Regency, using the topic of Human Growth and Development. This topic was selected because it is closely related to the lives of students who are in adolescence and allows investigation activities, information processing, project preparation, presentation of results, and reflection on learning experiences. The model was developed using the ADDIE procedure, which comprises Analysis, Design, Development, Implementation, and Evaluation. The resulting model is expected to serve as an alternative for science learning that is not only oriented toward academic competency achievement but also provides opportunities for the systematic internalization of Islamic educational values within students' learning experiences.

Theoretical Review

Science Learning

Science learning is a learning process that provides students with opportunities to understand various natural phenomena through the mastery of concepts, process skills, and direct learning experiences. Science learning is not only directed toward the ability to recall information but also toward the ability to observe phenomena, ask questions, conduct investigations, process information, draw conclusions, and communicate results. Therefore, science learning requires a process that can encourage students to actively participate in constructing their knowledge through meaningful experiences.

At the junior high school level, science learning needs to be developed in accordance with students' characteristics and life contexts. Science materials related to everyday phenomena provide opportunities for students to connect the concepts they learn with real-life experiences. Such learning can help students understand that science concepts do not stand alone but are interconnected with life, health, the environment, and various problems they encounter. Thus, science learning needs to provide opportunities for activities that are active, contextual, collaborative, investigative, and reflective.

One topic that aligns with these characteristics is Human Growth and Development. This topic is closely related to the lives of ninth-grade students because they are in adolescence and experience various changes in growth and development. Learning can be directed toward observing phenomena related to human growth and development, the factors that influence them, and the importance of maintaining health. The relevance of the topic to students' lives provides opportunities to develop investigative and project activities that enable students to gain direct learning experiences.

Science learning can also serve as a means of developing attitudes and values through scientific activities. When students conduct investigations, for example, they are required to use data appropriately, record observation results honestly, cooperate, take responsibility for their tasks, and respect the opinions of group members. Thus, the science learning process can contribute not only to the mastery of scientific knowledge and skills but also to

the development of students' attitudes. In the context of this study, this potential is strengthened through the integration of Islamic educational values into learning activities.

Based on this description, science learning in this study is positioned as a learning process that develops scientific knowledge and skills through active, contextual, collaborative, investigative, and reflective experiences. These characteristics provide the basis for selecting Project Based Learning as the pedagogical foundation of the developed model. PjBL provides a structured framework of activities that enables students to participate in planning, project implementation, investigation, presentation of results, evaluation, and reflection on learning experiences.

Project Based Learning (PjBL)

Project Based Learning (PjBL) is a learning approach that positions projects as a central component of students' learning experiences. Through PjBL, students do not merely receive information from teachers but become involved in identifying problems, planning activities, conducting investigations, producing a product or project outcome, and communicating the results. These characteristics make PjBL relevant to learning that emphasizes active engagement and contextual learning experiences.

PjBL has characteristics that support the integrated development of various student abilities. Project activities provide opportunities for students to develop thinking skills, problem-solving, communication, collaboration, responsibility, and information-processing skills. In its implementation, teachers do not only act as information providers but also as facilitators who provide guidance, guiding questions, and support when students encounter difficulties. Thus, learning interactions take place more actively among teachers, students, and the learning environment.

In this study, the basic structure of PjBL was developed into seven phases. These phases include determining fundamental questions, designing project planning, developing a schedule, monitoring the project and investigation, testing or presenting the results, evaluating the experience, and reflection and follow-up. The first six phases retain the main characteristics of PjBL, while the seventh phase is added as reinforcement to ensure that the project experience does not end with completion and presentation of the results. The addition of this phase is part of the model development carried out in this study.

The reflection and follow-up phase has an important function in connecting learning experiences with processes of meaning-making and improvement. In this phase, students are guided to reflect on their conceptual understanding, project implementation process, challenges encountered, learning experiences, and Islamic educational values acquired. The results of this reflection are then used as a basis for determining subsequent actions, such as improving project outcomes, strengthening understanding, or improving the learning process. Thus, project-based learning is not only oriented toward the product but also toward the process and experiences gained by students.

In this study, PjBL is not positioned as a standalone model but as a pedagogical foundation strengthened through the integration of Islamic educational values. Previous studies reviewed in the dissertation indicate that PjBL has been used in various contexts, including science learning, media development, scientific literacy, STEM, Islamic Religious Education, and character development. However, this study strengthens the approach by operationalizing Islamic educational values in activities at every phase and adding the Reflection and Follow-Up phase as a structured seventh phase.

Integration of Islamic Educational Values in Science Learning

Islamic educational values in learning are values that can be internalized through students' learning processes and experiences. In this study, Islamic educational values are not positioned merely as supplementary material, moral messages, or the inclusion of verses in teaching materials but are integrated through the activities students undertake during the learning process. This approach enables values to become part of students' actual experiences so that internalization occurs through actions, habits, interactions, and reflection.

The Islamic educational values integrated into the model include gratitude, trustworthiness, responsibility, discipline, honesty, cooperation, mutual respect, and caring. Trustworthiness relates to students' commitment to carrying out the tasks and roles entrusted to them. Responsibility is demonstrated through task completion and a willingness to be accountable for the process and results of their work. Discipline is developed through the preparation and implementation of project schedules, while honesty is demonstrated in obtaining, recording, processing, interpreting, and reporting data in accordance with the results obtained.

Cooperation and mutual respect are developed through task distribution, group discussions, problem-solving, decision-making, presentations, and giving and receiving feedback. Meanwhile, caring is developed through concern for personal health, the social environment, and a willingness to help group members. In the topic of

Human Growth and Development, gratitude is associated with students' awareness of their bodies, health, and the growth and development processes they experience. Maintaining health is regarded as an expression of gratitude as well as a responsibility toward oneself.

The integration of these values is systematically implemented at every phase of learning. In the phase of determining fundamental questions, for example, gratitude, caring, and mutual respect are developed through awareness of the body and health, as well as respect for questions and opinions. In the project planning phase, trustworthiness, responsibility, cooperation, and mutual respect are demonstrated through task distribution and group decision-making. In the scheduling phase, discipline and responsibility are developed through commitments to time and agreements. Subsequently, honesty, trustworthiness, responsibility, cooperation, and caring are developed throughout the investigation and data-processing process.

Thus, the integration of Islamic educational values into science learning is a process that connects scientific knowledge with the development of students' attitudes and behaviors through learning experiences. This integration does not eliminate the scientific character of science learning but enriches the learning process by providing students with opportunities to practice values through actual activities. This concept forms the basis for developing the science learning model based on PjBL integrated with Islamic educational values in this study, by positioning values as part of the activities in every learning phase and strengthening them through the Reflection and Follow-Up phase.

2. METHOD

This study employed a Research and Development (R&D) method aimed at developing a science learning model based on Project Based Learning (PjBL) integrated with Islamic educational values. The development was carried out using the ADDIE model, which consists of five stages, namely Analysis, Design, Development, Implementation, and Evaluation. This development model was selected because it provides systematic stages for analyzing needs, designing products, developing and validating products, implementing them in learning, and evaluating the quality and outcomes of their application.

The analysis stage was conducted to identify science learning needs and the initial conditions of learning implementation in schools. The analysis covered student characteristics, teacher needs, material characteristics, and learning conditions related to the implementation of Project Based Learning and the integration of Islamic educational values. The results of the analysis served as the basis for designing a learning model appropriate to the characteristics of ninth-grade junior high school students studying the topic of Human Growth and Development. The design stage was subsequently conducted by preparing the model design, learning tools, modules, student worksheets, and assessment instruments that support the implementation of the model.

The development stage involved transforming the design into a learning product consisting of the learning model and its supporting materials. The developed model comprises seven phases, namely: (1) determining fundamental questions, (2) designing project planning, (3) developing a schedule, (4) monitoring the project and investigation, (5) testing/presenting the results, (6) evaluating the experience, and (7) reflection and follow-up. Islamic educational values, such as gratitude, trustworthiness, responsibility, discipline, honesty, cooperation, mutual respect, and caring, are operationally integrated into every learning phase. The developed product was subsequently validated by experts to obtain information regarding the feasibility of the model and learning materials before implementation.

The implementation stage involved applying the learning model that had been declared feasible to ninth-grade junior high school students studying the topic of Human Growth and Development. Implementation was conducted over five meetings, involving teachers and students as users of the model. Research data were obtained through observations, teacher and student response questionnaires, assessments of teachers' ability to manage learning, student activity assessments, and learning outcome tests. The evaluation stage was conducted continuously to determine the achievement of development objectives and the quality of the model based on three main aspects, namely validity, practicality, and effectiveness.

Research data were analyzed quantitatively based on expert validation results, model implementation, teacher and student responses, teachers' ability to manage learning, student activity, and learning outcomes. Model validity was determined based on the results of validator assessments, while practicality was assessed through learning implementation and user responses to the model. Effectiveness was determined based on teachers' ability to manage learning, student activity, and improvements in learning outcomes before and after the model was implemented. Thus, the developed learning model was considered to meet the criteria when it demonstrated levels of validity, practicality, and effectiveness in accordance with the criteria established in the study.

3. RESULTS

Validity of the Learning Model

The development results indicate that the science learning model based on Project Based Learning (PjBL) integrated with Islamic educational values obtained an average validation score of 4.20, categorized as good and feasible for use. Validation was conducted on the developed learning model and its supporting materials. These results indicate that the model components met the established feasibility criteria and could therefore be used in the learning process after revisions were made based on feedback from the validators.

The feasibility of the model is demonstrated not only by the conformity of its syntax with PjBL but also by the clarity of the integration of Islamic educational values into every learning phase. The model consists of seven phases, namely determining fundamental questions, designing project planning, developing a schedule, monitoring the project and investigation, testing or presenting the results, evaluating the experience, and reflection and follow-up. Values of gratitude, trustworthiness, responsibility, discipline, honesty, cooperation, mutual respect, and caring are integrated through actual student activities so that these values do not merely become supplementary material but form part of the learning process.

The validation results indicate that the developed model has a sufficiently strong foundation for implementation in ninth-grade science learning. Positioning Reflection and Follow-Up as the seventh phase is one of the model's important characteristics because it provides students with opportunities to connect conceptual understanding, project experiences, investigation processes, the application of Islamic educational values, and improvement actions. Thus, model validity is not only related to the learning structure but also to the integration of science learning objectives, project experiences, and value formation within the learning process.

Practicality of the Learning Model

The practicality of the model was assessed based on learning implementation and teacher and student responses during implementation. The results of observations of model implementation over five meetings obtained an average score of 0.97, categorized as very good. Meanwhile, teacher responses obtained an average score of 3.90, or 97.50%, categorized as very good, while student responses obtained an average score of 3.86, or 96.50%, categorized as very positive. These results indicate that the model can be implemented effectively in the learning process and is acceptable to its users.

The practicality of the model is also evident in learning activities that directly involve students in identifying problems, planning projects, developing schedules, conducting investigations, collecting and processing information, cooperating in groups, presenting project results, evaluating experiences, and carrying out reflection and follow-up. Teachers act as facilitators who guide the learning process, provide guiding questions, monitor projects, offer feedback, and reinforce Islamic educational values. This sequence of activities demonstrates that the model's syntax can be operationalized systematically in learning.

The high level of acceptance among teachers and students also indicates that the supporting materials developed can assist in implementing the model. Responses to the module obtained a score of 3.90, or 97.50%, from teachers and 3.86, or 96.50%, from students. Thus, the science learning model based on PjBL integrated with Islamic educational values can be considered practical because it demonstrates very good implementation, is easy to apply in learning activities, and receives positive acceptance from users.

Effectiveness of the Learning Model

The effectiveness of the model was assessed based on teachers' ability to manage learning, student activity, and learning outcomes. The research results indicate that teachers' ability to manage learning obtained an average score of 4.60, categorized as very good, while student activity over five meetings obtained an average score of 0.98, indicating a high level of activity. These results indicate that implementing the model can create an active learning process and provide students with opportunities to participate directly in all project stages.

The effectiveness is also evident in the improvement of student learning outcomes. The average pretest score of 63.63 increased to 88.06 on the posttest, representing an increase of 24.43 points, with learning mastery reaching 100%. This improvement indicates that implementing the model not only encourages student involvement in project activities but also supports the achievement of understanding of the topic of Human Growth and Development. Investigation activities, information processing, presentation of results, evaluation of experiences, and reflection provide students with opportunities to construct and strengthen their understanding through active learning experiences.

Taken together, these results indicate that the science learning model based on PjBL integrated with Islamic educational values meets the criteria for effectiveness. The model's effectiveness is reinforced by teachers' very good ability to manage learning, high student activity, and improvements in learning outcomes and student learning mastery. The model's advantage also lies in the Reflection and Follow-Up phase, which ensures that project experiences do not end with the completion and presentation of products but continue through reflection on understanding, investigation processes, cooperation, Islamic educational values, and improvement actions.

The existence of the Reflection and Follow-Up phase is one of the important characteristics of the developed model. This phase provides students with opportunities not to stop at completing and presenting projects but to review their conceptual understanding, investigation processes, group work experiences, and the Islamic educational values applied during learning. This reflection helps students connect their project experiences with their understanding of human growth and development while recognizing the importance of gratitude, responsibility, discipline, honesty, cooperation, and caring in everyday life. Thus, project activities not only produce learning products but also provide experiences that encourage the internalization of values through processes experienced directly.

In addition to reflection, follow-up provides students with opportunities to use evaluation results as a basis for making improvements. Follow-up activities may include refining project outcomes, strengthening concepts that have not been understood, improving group work processes, and applying positive habits related to health and personal development. These characteristics strengthen the relationship between science learning, project-based experiences, and Islamic educational values. Thus, the developed model is not only oriented toward learning outcomes but also establishes a reflective and continuous learning process so that learning experiences can be applied in students' lives.

5. CONCLUSION

This study produced a science learning model based on Project Based Learning (PjBL) integrated with Islamic educational values for ninth-grade junior high school students studying the topic of Human Growth and Development. The model was developed using the ADDIE stages and consists of seven phases, namely determining fundamental questions, designing project planning, developing a schedule, monitoring the project and investigation, testing/presenting the results, evaluating the experience, and reflection and follow-up. The integration of Islamic educational values is operationally implemented through learning activities, including gratitude, trustworthiness, responsibility, discipline, honesty, cooperation, mutual respect, and caring.

The research results indicate that the developed model meets the criteria of validity, practicality, and effectiveness. The validity of the model and its supporting materials obtained an average score of 4.20, categorized as good and feasible for use. Practicality was demonstrated by a model implementation score of 0.97, categorized as very good, teacher responses of 97.50%, and student responses of 96.50%. The effectiveness of the model was demonstrated by teachers' ability to manage learning, with an average score of 4.60, student activity of 0.98, and an improvement in learning outcomes from an average of 63.63 on the pretest to 88.06 on the posttest, with learning mastery reaching 100%.

Thus, the science learning model based on PjBL integrated with Islamic educational values can serve as an alternative learning approach that combines mastery of science concepts, project-based learning experiences, investigative activities, and value formation within an integrated learning process. The Reflection and Follow-Up phase strengthens the model because students not only complete projects and acquire knowledge but also reflect on their experiences and the values applied, as well as determine improvement actions. Accordingly, this model contributes to the development of science learning that is active, contextual, collaborative, investigative, and reflective.

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