

Development of a Project-Based Learning Assessment Instrument for Islamic Religious Education at the High School Level

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Abstract

Nowadays, Islamic religious education (PAI) is presented using various learning methods. All of this aims to enrich the learning process so that it doesn't seem monotonous and boring. One interesting teaching method to practice among other teaching methods is project-based learning. Project-Based Learning is a teaching method that uses real and meaningful projects as the primary medium for students to achieve knowledge, attitudes, and skills (Cognitive, Psychomotor, and Affective). However, the actual project results of these students still show significant bias in their assessment. This situation is sometimes exacerbated by the subjectivity of teachers' assessments. Therefore, research needs to be conducted to develop the assessment instrument. This research uses a research and development (R&D) approach, with the 4D model (Define, Design, Develop, Disseminate). The research location is at Muhammadiyah High School in Tersono, Batang Regency, Central Java Province, Indonesia. The study will be conducted from September 1, 2025, to November 10, 2025. Developed according to the needs of project-based learning assessment instruments in Islamic Religious Education (PAI) subjects in the present era. The aim is to develop project-based learning assessment instruments in Islamic Religious Education subjects for high schools. The results of this research are instruments that teachers can use in assessing project-based learning in Islamic Religious Education subjects for high schools.

Keywords: Islamic religious education, assessment instrument, project based learning.

Introduction

The Islamic civilization that has existed until now cannot be separated from its education. Islamic Religious Education (PAI) is an important asset for students to navigate their life's journey. The journey of human life is inseparable from the opportunities and challenges that will be faced. In order to map the needs of students today, the initial step is to identify existing challenges. This is important because the challenges of Islamic religious education today are different from those in the past. The challenges of Islamic religious education in the present era are an important issue that needs to have its solutions formulated. The solution to these challenges in Islamic religious education must address the issues of advancements in

information technology, secularism in educational science, and the professionalism of Islamic religious education teachers (Aprilia & Sajari, 2022)

The professionalism of PAI teachers plays a crucial role in shaping the character and morality of students. However, the methods of Islamic Religious Education (PAI) that are often conventional and teacher-centered are less capable of facilitating the development of critical, creative, and collaborative thinking skills needed in the digital age. This is exacerbated by findings from various studies indicating that research instruments used to measure the effectiveness of Islamic Religious Education (PAI) learning are still largely not integrated with innovative learning approaches, such as Project Based Learning (PjBL). PjBL is a learning model that involves students in real-world projects to solve authentic problems (Dian & Noviati, 2021). This model encourages active participation, in-depth exploration, and the development of concrete products or outcomes.

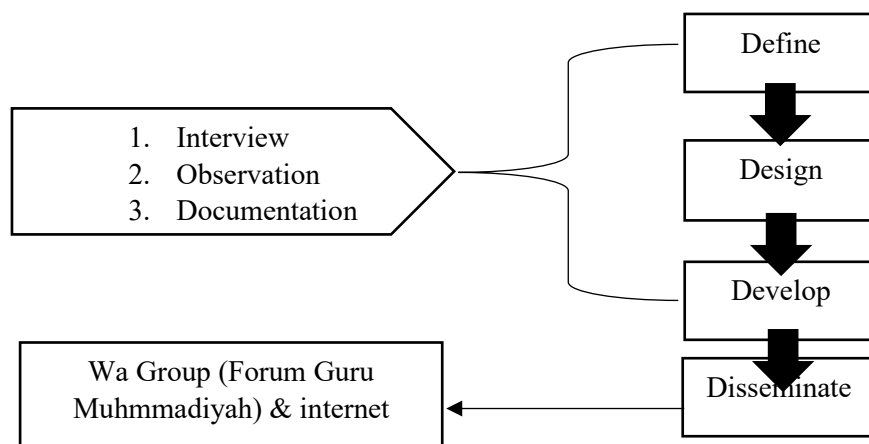
The development of concrete products or outputs provides tangible results and a clear direction for both teachers and students. However, it doesn't stop at the product development process; the next focus for teachers is to provide clear assessment instruments to avoid bias and ensure objectivity in the evaluation. This clear, unbiased, and objective assessment is aimed at developing teachers' sensitivity to understand the cognitive, affective, and psychomotor aspects of students (Juhaeni, Abdillah nur, Wafda, 2024). Teachers need to comprehensively understand students' cognitive, affective, and psychomotor domains. To accompany student development, these three aspects must always be the teacher's focal point. Especially in these challenging times, knowledge alone is not enough for students.

The results of observations at Muhammadiyah Tersono High School indicate that bias still occurs in the assessment of project-based learning in Islamic Religious Education (PAI) subjects. If this bias is allowed to continue without a solution, it will hinder the smooth learning process using the project-based learning method. The biases that occur include unclear assessment instruments, continued subjectivity in assessment, and the formality of creating projects solely to fulfill requirements. Project-based learning will clearly foster student learning motivation (Pangesti et al., 2020). This situation must be accompanied by clear and easily understandable instruments for the teachers themselves and the students. It is clear how important the role of project-based learning assessment instruments is in the face of these complex problems.

Methods

Research Design

The research design uses the R&D research type with the four-D model (Define, Design, Develop, Disseminate). The Four-D Model development model is recommended by Sivasailam Thiagarajan, Dorothy S. Semmel, and Melvyn I. Semmel. The four stages, consisting of definition, design, development, and dissemination, serve as its flow and concept map. The flow of activities carried out at each stage of development can be described as follows:



Participants

The objects and respondents in this study include, among others, Mr. Deni Alfian, S.Pd., a PAI teacher at Muhammadiyah Tersono High School; Mrs. Eka Siwi Martiana, S.E., the Deputy Head of Curriculum at Muhammadiyah Tersono High School; Davi Adam Hamam, the class president of 10th grade; Irsyad Fadhil, the class president of 11th grade; Farid Rizqianto, the class president of 12th grade A; and Fernanda Hilda P., the class president of 12th grade B. These respondents were chosen because they were considered suitable and capable of providing the necessary information.

Research Procedures

Dalam melaksanakan prosedur penelitian R&D model four-D maka perlu memperhatikan empat tahapan berikut dengan runtut.

Table 1 research procedures

Stage	Main Focus	Output
1. Define	Setting product requirements and objectives	Problem formulation, learning needs, and objectives
2. Design	Design a product prototype	Initial draft of the product (prototype) and research instruments
3. Develop	Validating, testing, and revising	A final product that is valid and effective.
4. Disseminate	Implementing and disseminating	The product is widely distributed and used.

Data Collection Technique(s)

Data collection techniques are a very important procedure in the research process, containing ways to collect data (Pascasarjana, 2023). This research uses the purposive sampling technique, which is a random selection of samples where each sample has specific attributes according to the needs of the research problem formulation. Data collection techniques used observation, interviews, and documentation. This technique aims to obtain in-depth and descriptive data, such as experiences, perceptions, and meanings from research subjects.

Data Analysis Technique

According to Miles and Huberman in Sugiyono (2020:133), they state that activities in qualitative data analysis are carried out interactively and continuously until complete, so the data is saturated. As for the steps, they are as follows:

1. **Data Collection** In qualitative research, data collection is done thru observation, in-depth interviews, and documentation, or a combination of all three (triangulation). Data collection is done for days, perhaps months, so a large amount of data will be obtained. In the initial stage, the researcher conducted a general exploration of the social situation/object being studied, recording everything seen and heard. Thus, the researcher will obtain a large and highly varied amount of data.
2. **Data Reduction** The longer the researcher is in the field, the more data will accumulate, becoming complex and intricate. Therefore, data analysis needs to be done immediately thru data reduction. Reducing data means summarizing, selecting, and choosing the essential things, focusing on the important aspects, and looking for themes and patterns. Thus, the reduced data will provide a clearer picture and make it easier for the researcher to proceed and retrieve the data if needed.
3. **Data Presentation** After the data has been reduced, the next step is to present the data. In qualitative research, data is presented in the form of narrative text.

4. Drawing Conclusions and Verification Conclusions in qualitative research are new findings that did not exist before. The findings can be a description or picture of an object that was previously dim or dark, but became clear after being researched.

Results

SMA Muhammadiyah Terseno is located at Jl. Raya Limpung-Terseno, Miluwung, Rejosari Barat, Terseno District, Batang Regency, Central Java Province, Indonesia. With more detailed information as follows: NPSN: 20322739, the status of this school is private, the educational form of the organizer is SMA (Senior High School), the ownership status is owned by the Muhammadiyah foundation, the school establishment decree is 1304/II03.25.02/Ib.1986, the date of the establishment decree: 1986-10-30, Operational Permit Decree: 743/103/I-87, Operational Permit Decree date: 1987-05-05. In order to realize the Vision and Mission of SMA Muhammadiyah Terseno, the school always bases itself on the Islamic educational thinking of KH. Ahmad Dahlan, the founder of the Muhammadiyah organization in 1912 AD.



Figure. 1 Photo of the Muhammadiyah Terseno High School building

According to KH. Ahmad Dahlan, the general view of Islamic education is that its goal should be directed toward forming a Muslim human being with noble character, religious knowledge, broad perspective and understanding of worldly sciences, and a willingness to strive for the progress of their community (Mainuddin & Septiani, 2022). This noble goal is implemented at Muhammadiyah High School thru several activities, including those listed in the following table:

Table 1. teaching and learning activities

No	Religious Activities	Learning Model	Extracurricular
1.	Dhuha Prayer	Problem Based Learning	Extra Tahfidz
2.	Asmaul Khusna & Morning Tadarus	Project Based Learning	Extra Tapak Suci
3.	Congregational Dhuhr Prayer	Discussion	Extra Volleyball
4.	Congregational Asr Prayer	Outing Class	Extra computer
5.	Iftar Together in Ramadan		Scout
6.	Visiting Relatives in Shawwal		Hizbul Wathan
7.	Islamic Commemoration Day		Osis/IPM

Religious activities in the school environment are carried out regularly and purposefully to shape the students' religious character. Every morning, students perform Dhuha prayers combined with the Problem-Based Learning model, so students not only worship but also learn to solve problems contextually. Additionally, the reading of Asmaul Husna and morning tadarus

are linked to Project Based Learning, which encourages students to develop value-based spiritual learning projects. The Dhuhr prayer in congregation is combined with a discussion model, providing space for students to dialog about Islamic insights. Meanwhile, congregational Asr prayer is developed thru the Outing Class method, creating a more open and contextual learning environment. Religious activities are also enriched thru special programs during the holy month, such as breaking fast together in Ramadan, and visiting relatives in Syawal to strengthen relationships among school members. Religious activities will cultivate good character and noble morals in high school students (Hafidz et al., 2022)

Additionally, the school also organizes celebrations of major Islamic holidays as a form of respect for religious values. In addition to these activities, the school also provides various extracurricular activities to support students' interests and talents. The Tahfidz program helps students deepen their memorization of the Quran, while Tapak Suci, volleyball, computer, and Pramuka provide space for physical, skill, and discipline development. There are also organizations like Hizbul Wathan and OSIS/IPM, which serve as platforms for students to learn leadership and organizational skills, ensuring comprehensive and balanced character development. Explicit scouting activities will shape students' characters to think critically, become accustomed to solving problems, and engage in activities based on the value of togetherness (Maskhuliah, 2023).

All of the above programs are strategies aimed at restoring the success of Muhammadiyah Tersono High School, according to Eka Siwi Martian, S.E., as the deputy head of Muhammadiyah Tersono High School. In the past, this school had a time when the number of students reached hundreds, but in 2019, it only received 9 students from its SPMB results. In an effort to improve, all educators and foundation staff are trying to optimize qualified human resources, one of whom is Deni Alfian, S.Pd., who has been a PAI teacher since 2019. In Mr. Deni Alfian's concrete efforts, he implemented one of the learning models, namely project-based learning. The results of this effort still require evaluation of its assessment instruments, as adults, evaluation is an integral part of a process (Adnan et al., 2024).

Discussion

Project Based Learning

Learning consists of three interconnected stages, starting with the introduction, the core, and the conclusion. To motivate students, teachers usually try to manage their classrooms as well as possible. This is intended to make students more interested and prevent them from feeling bored. Implementing learning strategy theories is a way to overcome student boredom during learning. One learning strategy is project-based learning (PjBL). Project-based learning provides opportunities for a student-centered, more collaborative learning system where students are actively involved in independently completing projects and working together in teams, integrating real and practical problems. The goals to be achieved for students are very diverse, for example, cognitive, affective, and psychomotor (Damayanti, 2023).

Developing project-based learning assessment instruments for Islamic Religious Education (PAI) at the high school level is an important need for improving the quality of more meaningful learning. The project-based approach requires students to actively engage in solving religious problems contextual to daily life. However, developing appropriate assessment instruments is not simple because they must balance cognitive, affective, and psychomotor aspects. Teachers need to ensure that the instruments used are capable of authentically depicting students' learning processes and outcomes. Additionally, project assessments must include clear indicators to avoid subjectivity and remain fair to all students. The biggest challenge is ensuring that the assessment not only evaluates the final product but also the process of creating it. Teachers are also required to understand authentic assessment techniques that are suitable for the characteristics of Islamic Religious Education (PAI) learning. This necessitates continuous training and mentoring to ensure teachers have adequate competence. Instrument development must also consider the curriculum and the needs of high school students. Thus, project

assessment instruments can become relevant measurement tools capable of promoting more applied learning.

Student anxiety in project-based learning in Islamic Religious Education at the high school level often arises when they feel they don't fully understand the task requirements they need to complete or are afraid they won't be able to meet the established assessment standards. Many students are anxious because the project requires creativity, cooperation, and the ability to process religious information in depth, while they feel they are not yet confident in explaining or connecting PAI material to real life. Concerns also arise when assessments are conducted authentically, as students feel that every process they undertake is directly supervised and evaluated. Additionally, the uneven abilities within the group make some students afraid of being seen as not contributing or, conversely, burdened by less active peers. The long working time and the requirement for a presentation added to the feeling of unease, especially for students who are less confident speaking in public. All these conditions make students feel pressured and worried that their project results will not reflect their abilities to the fullest extent.

One of the main challenges in developing project-based assessment instruments for Islamic Religious Education (PAI) in high school is the diversity of student abilities. Each student has a different religious knowledge background, so the assessment standards must remain inclusive. Teachers often find it difficult to determine assessment rubrics that can accommodate these differences without reducing objectivity. The assessment instrument must also be able to describe the development of religious attitudes, which are not easily measured quantitatively. Additionally, students tend to work on projects in groups, making individual assessment more complex. There is a risk that passive students will be overshadowed by dominant group work. On the other hand, teachers must ensure that every student has the opportunity to develop thru project activities. Time constraints in learning also add to the difficulty of conducting a comprehensive project assessment. The teacher must balance administrative demands with the need to guide the project completion process. This condition makes the development of assessment instruments require more innovative and flexible strategies.

A feasible solution is the creation of detailed, systematic, and easily understandable assessment rubrics for students. The rubric should cover aspects of process, collaboration, creativity, accuracy of content, and the quality of the final project product. Teachers can develop tiered rubrics that provide clear descriptions for each assessment level. To ensure objectivity, the rubric must be shared with students before the project begins. By doing so, students understand the standards they need to achieve and are able to direct their efforts appropriately. The rubric should also consider Islamic values such as honesty, responsibility, and work ethics. Teachers can add direct observation indicators to assess students' attitudes and engagement during the working process. Additionally, the use of self-assessment and peer assessment can enrich the assessment data. This method provides students with the opportunity to reflect on their roles and contributions. With comprehensive instruments, project assessments become more accurate and fully represent students' abilities.

Another challenge is the limited ability of teachers to master authentic evaluation techniques suitable for project-based learning. Not all teachers have experience in designing assessment instruments that measure both the learning process and outcomes. Minimal formal training also leads to teachers being less confident in developing innovative instruments. In addition, the high administrative burden makes it difficult for teachers to find time to develop instruments in depth. The limited facilities and resources at the school also affect the quality of projects students can undertake. However, project-based learning requires adequate technological support and supporting materials. This difficulty is further exacerbated when the number of students in the class is quite large, making process supervision less than optimal. Teachers also need to ensure that each project remains in line with Islamic values and does not go beyond the boundaries of learning ethics. For assessment instruments to be effective,

teachers must understand how to assess creativity without neglecting the accuracy of religious values. Therefore, teacher capacity building is an urgent step that needs to be prioritized.

Table 2 collaboration indicator

No	Indicator	Description
1.	<i>Love performing tasks</i>	Responsibility for obligations toward the individual's role in the group to complete project tasks.
2.	<i>Effort in work</i>	Creating a step-by-step plan for completing the project task.
3.	<i>Interaction skills during work</i>	Preparing the tools and materials for the project task. Gathering all the information obtained while working on the project assignment. Expressing one's own opinion within a group when drawing conclusions from project work results.
4.	<i>Time management</i>	Punctuality in completing project tasks.

Table 3 indicator Care assessment

Outcome 2

No	Indicator	Description
1.	<i>Concern</i>	Paying attention when group members are speaking while working on the project task. Correcting friends in the group if they make mistakes or do something outside of the project's tasks.
2.	<i>Emphaty</i>	Not leaving friends in the group to struggle while working on the project assignment. Valuing the opinions of friends in the group when working on a project assignment.
3.	<i>Sharing</i>	Sharing tools or materials when a friend doesn't have them while working on a project. Sharing reflections with friends in the group on project activities and task results.

To make it easier for teachers to assess, here is a rubric that can be used in assessing student projects, using a 1-4 scale. A score of 1 on the following rubric indicates the lowest-quality student project, while a score of 4 indicates the highest quality.

Table 4 Rubric for Assessing Islamic Religious Education (PAI) Projects for High School

Assessment Aspects	Score 4 (Very Good)	Score 3 (Good)	Score 2 (Sufficient)	Score 1 (Poor)
Understanding Islamic Material	Deep understanding of concepts, strong argumentation, consistent with principles, without conceptual errors.	Good understanding, mostly correct with a few errors.	There is a shallow understanding and some misconceptions.	There are many misconceptions and it is not in line with the PAI material.
Project Execution Process	Following all stages systematically, diligently, and responsibly.	The project stages are quite systematic but not yet optimal.	The process is less organized and some stages are not completed.	Not following project stages, the process is unfocused.

Islamic Attitudes and Values (Affective)	Demonstrates Islamic morals, honesty, good cooperation, and consistency.	Good attitude, but not yet consistent.	The attitude is quite good but less relevant to Islamic values.	This attitude does not reflect Islamic morals.
Creativity and Innovation	The idea is very creative, innovative, original, and the product is highly relevant.	Creative and quite innovative idea.	The ideas are not very creative and lack innovation.	There is no creativity in the project.
Quality of the Final Product	The product is very neat, informative, complete, and meets project requirements.	The product is neat and quite complete with a few minor flaws.	The product is incomplete and not in accordance with the instructions.	The product does not meet the criteria.
Project Presentation	The delivery is clear, systematic, confident, and able to answer questions.	The delivery is quite good but lacks depth.	The presentation is unsystematic and shows a lack of understanding of the material.	Unable to explain the project correctly.

Value Calculation:

Maximum Score	24
Final Score	$(\text{Total Skor} / 24) \times 100$

Conclusion

The result of this research is an assessment instrument for project-based learning in Islamic Religious Education (PAI) subjects at the high school level. This assessment instrument is useful for assisting teachers and students in implementing the project-based learning model. More specifically, we presented these results to the PAI teachers at Muhammadiyah Tersono High School and the Vice Principal for Curriculum. Then we shared those results in the WhatsApp group forum for Muhammadiyah teachers in Batang Regency.

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Conflict of interests

In the process of developing project-based learning assessment instruments for Islamic Religious Education at the high school level, potential conflicts of interest can arise when the teacher who develops the assessment instrument is also the primary evaluator of student project

results. This condition can lead to bias because teachers may have certain preferences for specific groups or individuals of students, making the assessment not entirely objective. Conflicts of interest can also arise if the instrument developers have personal or professional relationships with stakeholders, such as publishers, training institutions, or school officials who want to highlight certain results for institutional image. Additionally, when assessment instruments are developed based on specific religious views or approaches that are not entirely neutral, there is potential for bias that can reduce fairness in assessing students' overall abilities. In this context, the involvement of stakeholders with specific interests can influence the quality, objectivity, and integrity of the assessment instruments developed.

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