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Integrating Prophetic Values in Mathematics Learning: Enhancing Connection Abilities and Islamic Character in Middle Schools

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Abstract: Mathematics learning in madrasahs has largely focused on conceptual understanding, while the systematic integration of spiritual values into mathematics instruction remains limited. Consequently, students' mathematical connection ability (MCA) and Islamic character (IC) are often developed separately rather than through an integrated learning process. This study aimed to develop student worksheets (LKPD) based on a prophetic approach and to examine their validity, practicality, and effectiveness in improving both MCA and IC. The study employed a Research and Development (R&D) design using the ADDIE model, which consists of the stages of Analysis, Design, Development, Implementation, and Evaluation. The participants were seventh-grade students of a Madrasah Tsanawiyah, involving a limited trial class, an experimental class, and a control class. Data were collected through expert validation sheets, student practicality questionnaires, MCA tests, and IC questionnaires, supported by classroom observations and interviews. Descriptive analysis was used to determine the validity and practicality of the developed LKPD, while inferential analysis was conducted using Multivariate Analysis of Covariance (MANCOVA) with pretest scores as covariates. The results showed that the developed LKPD achieved 85% validity and 90% practicality, indicating that the worksheets were feasible and well accepted in classroom learning. The MANCOVA results further revealed a statistically significant effect of the prophetic-approach-based LKPD on students' MCA and IC ($p < 0.05$) after controlling for initial differences. Findings from classroom observations and student reflections also indicated that integrating prophetic values encouraged responsible participation, collaborative engagement, and reflective thinking during learning activities. These results suggest that integrating prophetic principles humanization, transcendence, and liberation into mathematical tasks can support both conceptual understanding and character development within mathematics learning. Overall, the study highlights the potential of value-integrated instructional materials to promote more holistic mathematics learning in madrasah contexts.

Keywords: LKPD, prophetic approach, mathematical connection ability, islamic character, madrasah tsanawiyah.

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INTRODUCTION

Educational institutions are instrumental in shaping the capabilities of the nation's future leaders. Amid the rapid advancement of education, educational institutions are increasingly expected to innovate to make the learning process more effective. This kind of innovation helps students grow their thinking skills, especially higher-order thinking (Kenedi et al., 2019). Moreover, students today are expected not only to understand what they learn in school but also to connect that knowledge to real-life situations, all while developing positive character traits that shape their daily actions and decisions (Sumarsih et al., 2018).

International assessments such as the Program for International Student Assessment (PISA) indicate that Indonesian students still

demonstrate relatively low mathematical connection ability (MCA), particularly in linking concepts to real-life contexts (OECD, 2023). This condition reflects a tendency for mathematics learning to prioritize procedural mastery over meaningful conceptual understanding (Al-Mutawah et al., 2019). In the context of madrasah education, the challenge becomes more complex because learning is expected not only to develop cognitive competence but also to cultivate IC (Fahrurrozi et al., 2025). However, the integration of mathematical thinking with value-based education has not yet been systematically conceptualized (Setiawan et al., 2025). Consequently, an approach is needed that bridges cognitive development with ethical and spiritual dimensions. The prophetic approach proposed by Kuntowijoyo, grounded in the principles of humanization, liberation, and transcendence, offers a theoretical foundation for integrating MCA with IC formation in learning (Arum, 2018).

Within the Indonesian education system, madrasahs are formal institutions that integrate general and religious education, including Madrasah Ibtidaiyah (MI), Madrasah Tsanawiyah (MTs), and Madrasah Aliyah (MA), operating in both the public and private sectors. Learning in madrasahs is structured to integrate scientific competence with religious values, enabling the objectives of the national curriculum to be achieved. This mandate is consistent with Law Number 20 of 2003 concerning the national education system. Furthermore, the Decrees of the Minister of Religious Affairs, Numbers 183 and 184 of 2019, regulate the implementation of Islamic Religious Education (PAI), Arabic language instruction, and the madrasah curriculum, reinforcing the institutional responsibility for integrating cognitive and character development.

Learning in madrasahs has not yet maximized the application of Islamic values in general subjects. It appears that general and religious subjects are treated as separate in terms of value integration. In mathematics, students tend to view learning as simply learning numbers. However, understanding numbers and mathematical concepts can also be challenging due to the abstract nature of mathematics. If cognitive abilities are limited, integrating spiritual values into mathematics learning becomes even more challenging. This situation highlights the importance of developing mathematical connection abilities so students can think at a higher level (Jailani et al., 2020; Affandi et al., 2024).

Mathematical connection ability (MCA) in this study refers to the connection standards proposed by the National Council of Teachers of Mathematics (NCTM, 2000), which emphasize internal connections among mathematical ideas, the formation of coherent conceptual structures, and the application of mathematics in real-life and interdisciplinary contexts. This perspective is consistent with previous studies that highlight the importance of relating mathematical problems to daily life and other disciplines(Diana et al., 2020). Mathematical connection abilities are crucial for students. This is because they guide students in understanding problems as they relate to their daily lives. If students can understand these problems, they can solve them effectively (Amalia et al., 2022). Furthermore, this ability serves as a link between the application of Islamic values, which are the foundation of IC, and learning. In this way, students can experience learning that is fun, enjoyable, and relevant to the demands of 21st-century education (Sari & Karyati, 2020).

Although the curriculum emphasizes meaningful and contextual learning, its implementation in classrooms often depends heavily on the availability of appropriate instructional tools. Teachers require learning materials that not only present mathematical procedures but also guide students in connecting concepts, reflecting on their learning, and

internalizing values in a structured way (Azmi et al., 2023). In this context, the development of well-designed student worksheets (LKPD) becomes essential. LPKD can serve as a pedagogical bridge, translating curriculum intentions into concrete classroom practices, supporting students in building mathematical connections while integrating value-based learning experiences.

In addition to cognitive development aspects, education in madrasahs also plays a key role in cultivating Islamic values as the foundation for the initial formation of students' character. Islamic Character (IC) traits such as religiosity, trustworthiness, siddiq (preaching), tabligh (prophetic), and fathanah (prophetic) need to be instilled through the learning experience. Students are encouraged to not only understand concepts conceptually but also to genuinely develop IC, as reflected in their attitudes and behavior (Marlina et al., 2025). In this context, mathematics learning is not merely a cognitive domain but also a potential space for the internalization of values within everyday classroom practices.

However, in mathematics instruction, the learning tools generally used by teachers have not yet been explicitly integrated with Islamic values. As a result, the instillation of Islamic values is often delivered only orally and is not yet connected to students' mathematical thinking processes. These conditions prevent mathematics learning from fully demonstrating the integration between cognitive mastery and the formation of students' IC (Aprilia & Munifah, 2022). This gap indicates the need for an integrative educational framework that systematically bridges intellectual development and value formation.

To address these issues, the prophetic approach proposed by Kuntowijoyo, grounded in the pillars of humanization, liberation, and transcendence, offers a relevant alternative framework in the educational context (Arum, 2018). Conceptually, this approach resonates with educational theories that position learning as a process of emancipation and social transformation through critical consciousness (Giroux, 2021). Furthermore, the dimensions of humanization and transcendence emphasize that education should not be oriented solely toward cognitive achievement, but also toward the moral and spiritual formation of learners within a holistic character education framework (Kartika et al., 2025). In this study, the prophetic approach is positioned as an integrative perspective that combines intellectual, ethical, and spiritual dimensions of learning. It serves as the foundation for implementing mathematics instruction rooted in prophetic values (*nubuwah*), aiming not only to deepen conceptual understanding but also to cultivate IC through the interconnected processes of humanization, liberation, and transcendence.

The prophetic approach can be applied in learning through various activities, such as problem-solving discussions in group work and reflection activities (Aisyah & Usdiyana, 2022). In mathematics education in madrasas, this approach is considered suitable because it provides students with opportunities not only to understand mathematical concepts but also to internalize Islamic values in their learning (Affandi et al., 2024). Linking mathematical concepts to life values and spiritual aspects encourages students not only to follow procedures and obtain calculation results, but also to understand the meaning of the learning activities they undertake (Irwanto et al., 2023). In this way, mathematics learning is expected to develop logical thinking skills while fostering students' moral and spiritual awareness.

Several previous studies have shown that teaching materials that incorporate Islamic values can improve conceptual understanding, foster positive learning attitudes, and support the development of students' character (Rahmawati & Rizki, 2017). On the other hand, other research

has developed student worksheets (LKPD) to facilitate students' MCA through a contextual approach (Ulfa et al., 2023). However, these two lines of research still tend to run separately. Studies based on Islamic values generally emphasize character development without a specific focus on MCA. In contrast, research on the development of mathematics LKPD tends to prioritize cognitive outcomes without systematically integrating a prophetic value framework. As a result, research that simultaneously combines MCA and IC development within a single instructional design remains limited, particularly through prophetic-approach-based LKPDs in madrasah contexts. This gap indicates the need for a more integrative learning tool that unites cognitive and value dimensions. Therefore, this study is directed toward developing prophetic-approach-based LKPDs that integrate mathematical thinking processes with the instillation of Islamic values in a single learning tool.

In response to these problems, this study aims to develop and evaluate a student worksheet (LKPD) grounded in a prophetic approach to mathematics learning in madrasahs. This research examines the validity of the developed LKPD, its practicality based on students' responses, and its effectiveness in improving MCA and supporting students' IC development. In line with these objectives, this study seeks to produce a mathematics learning tool that can be effectively implemented in instruction and aligned with prophetic values and the goals of madrasah education. To clarify the focus of the study, the research is guided by the following questions: (1) How valid is the prophetic-approach-based LKPD developed for mathematics learning in madrasahs? (2) How practical is the developed LKPD based on students' responses during implementation? Moreover, (3) How effective is the LKPD in improving mathematical connection ability (MCA) and supporting the development of students' Islamic character (IC)?

METHOD

Participants

This research was conducted at Islamic Junior High School (MTs) MINAT Kesugihan, Cilacap, during the odd semester of the 2025/2026 academic year. The research subjects were seventh-grade students. Three classes were selected using purposive sampling. Prior to the intervention, a pretest was administered to assess students' initial mathematical abilities and to examine baseline equivalence between groups. The results of the Shapiro–Wilk test indicated that the pretest scores were normally distributed ($p = 0.113 > 0.05$). Levene's test for equality of variances showed that the data met the assumption of homogeneity ($F = 0.530$, $p = 0.469$). An independent samples t-test further revealed no significant difference between the control class ($M = 51.18$, $SD = 11.92$) and the experimental class ($M = 49.06$, $SD = 14.08$), $t(67) = 0.674$, $p = 0.503$. These findings confirm that the two groups were statistically equivalent prior to the implementation of the treatment.

The three classes used as research subjects were Class VII C as a limited trial class, Class VII A as an experimental class, and Class VII B as a control class. The number of students in Class VII C was 17, in Class VII A 36, and in Class VII B 33. The learning model applied in all classes was problem-based learning (PBL). The experimental class used a prophetic-approach-based LKPD, while the control class used a conventional LKPD.

The conventional LKPD used in the control class followed a common worksheet format typically applied in mathematics instruction. It consisted of a concise summary of the material, worked example problems, and competency test sections comprising multiple-choice questions, short-answer items, and essay questions. In addition, remedial exercises were provided for students who had not yet achieved mastery. The worksheet primarily served as a reinforcement and evaluation tool, emphasizing procedural

practice and individual task completion. Although it supported the structure of classroom learning activities, it did not include structured reflective components, collaborative discussion prompts, or value-oriented integration as embedded in the prophetic-approach-based LKPD used in the experimental class. Therefore, the difference between the two worksheets lies not only in the absence of integration of prophetic value but also in the learning design orientation, in which the developed LKPD emphasizes reflective engagement, contextual exploration, and guided conceptual connections.

Research Design and Procedures

This study employed a Research and Development (R&D) design. The development model used in this research is ADDIE. The ADDIE model has five stages: Analysis, Design, Development, Implementation, and Evaluation. The ADDIE model was chosen because its stages are structured and systematic, allowing for product improvement at each stage. Furthermore, this model facilitates product adjustments as needed, making the development results more relevant and effective for learning (Branch, 2009; Spatioti et al., 2022).

In the analysis stage, learning needs were identified, and students' characteristics in the madrasah were understood. This phase also included in-depth observations of issues related to low mathematical connection abilities and the lack of IC evident in mathematics learning. Alongside observations, data were collected through interviews with mathematics teachers and students at the madrasah.

Next, during the design stage, the student worksheet (LKPD) was developed using a prophetic approach. This stage involved determining learning outcomes and objectives, formulating MCA indicators, developing IC indicators, and systematically integrating prophetic values into each learning activity. The integration was not limited to the inclusion of religious quotations, but was operationalized pedagogically through task structure and learning interactions.

The principle of humanization was embodied through collaborative problem-solving activities that encouraged dialogue, mutual respect, and appreciation of diverse mathematical reasoning among students. Contextual problems were designed to relate mathematical concepts to students' real-life experiences, fostering empathy and social awareness. The principle of liberation was implemented through open-ended and non-routine problems that required critical thinking, reasoning, and justification, thereby moving students beyond procedural computation toward conceptual understanding and intellectual autonomy. Meanwhile, transcendence was operationalized through guided reflection sections at the end of each activity, in which students were invited to contemplate the order, consistency, and logical structure of mathematical concepts as manifestations of divine wisdom, thereby linking cognitive processes to spiritual awareness.

After the LKPD design based on the prophetic approach was completed, improvements were made during the development stage. It was then piloted in a pilot class to assess the practicality of the LKPD. Assessments will include the clarity of instructions, the feasibility of activities, and the integration of prophetic values. The results of the pilot test are then used to revise the LKPD to make it more practical, more comprehensible, and better able to support the development of students' mathematical connection abilities and IC.

In the implementation phase, the revised, appropriate, prophetic approach-based student worksheets were administered to the treatment group, while the comparison group used conventional student worksheets. During the learning process, observations were made of students' classroom activities, particularly their use

of worksheets. This phase also aimed to assess the extent to which the student worksheet based on the prophetic approach influenced students' mathematical connection abilities and IC.

The final stage of the ADDIE model is evaluation. This stage aims to assess the effectiveness of the implemented prophetic-approach-based student worksheet (LKPD). The assessment includes the validity of the LKPD based on expert judgment, the practicality of its use as reflected in students' responses, and its effectiveness in improving students' mathematical connection abilities and IC. The supporting data prepared include a validation sheet, a practicality questionnaire, MCA test items, and an IC questionnaire. Furthermore, the ADDIE stages in developing a prophetic-approach-based student worksheet are presented in Figure 1.

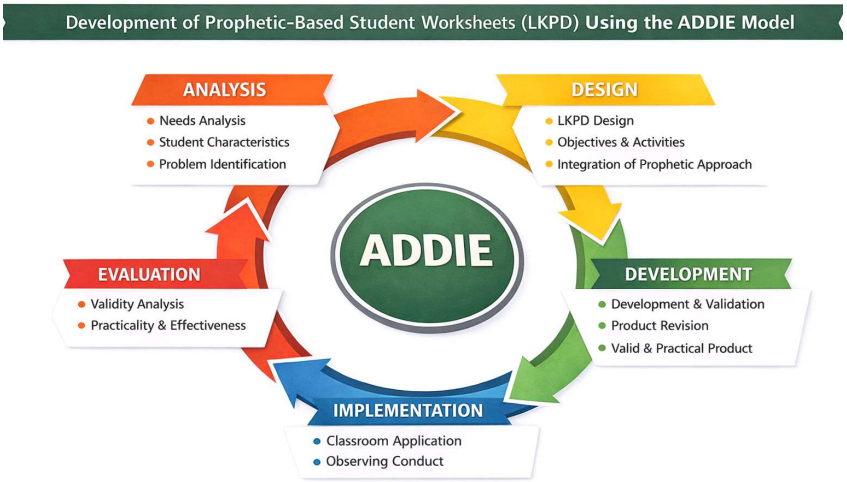


Figure 1. ADDIE design

Instrument

The research instruments consisted of (1) an expert validation sheet, (2) a practicality questionnaire, (3) an MCA test, and (4) an IC assessment questionnaire. Each instrument was developed based on theoretical frameworks aligned with the research objectives and was subjected to validity and reliability testing prior to implementation.

The LKPD validation sheet was developed as a structured questionnaire and used by three experts in mathematics education to evaluate the feasibility of the LKPD. The validation covered several aspects, including: (1) content appropriateness, (2) linguistic clarity, (3) presentation and layout, (4) integration of prophetic approach values (humanization, liberation, and transcendence), and (5) alignment with indicators of MCA and IC.

Each item was rated using a four-point Likert scale ranging from 1 (not appropriate) to 4 (very appropriate) (Moreira Mora & Espinoza Guzmán, 2016; Sugiyono, 2024). The percentage results were interpreted according to the validity criteria shown in Table 1.

Table 1. Validity categories of the developed LKPD

Percentage Range	Validity Category
81–100%	Very Valid
61–80%	Valid
41–60%	Moderately Valid
< 40%	Less Valid

The practicality questionnaire was developed as a non-test instrument using a four-point Likert scale and administered to students in the trial class to assess the usability of the

LKPD based on the prophetic approach. The questionnaire consisted of 17 statement items.

The instrument covered several aspects, including: (1) clarity of instructions, (2) visual appearance and layout, (3) sequence of activities, (4) language readability, (5) time suitability, (6) relevance to learning materials, (7) support for MCA (connections among mathematical concepts, real-life applications, and interdisciplinary links), and (8) integration of IC values and prophetic pillars (religiosity, siddiq, amanah, tabligh, fathanah, humanization, liberation, and transcendence).

Each item was rated on a scale of 1 to 4, where 1 = Not Appropriate, 2 = Less Appropriate, 3 = Appropriate, and 4 = Very Appropriate (Sugiyono, 2024). The resulting percentage was interpreted according to the practicality criteria presented in Table 2.

Table 2. Categories of LKPD practicality

Percentage Range	Practicality Category
81–100%	Very Practical
61–80%	Practical
41–60%	Moderately Practical
< 40%	Less Practical

Prior to implementation, the practicality questionnaire was validated by an expert in mathematics education to ensure content validity. The validation covered five aspects: clarity of wording, suitability of content with indicators, completeness of coverage, relevance to research objectives, and overall feasibility. The validation results were analyzed using a percentage formula and interpreted according to predetermined validity criteria.

The MCA test was developed based on the connection standards proposed by the National Council of Teachers of Mathematics (NCTM, 2000). The indicators used in this study include: (1) recognizing and using connections among mathematical ideas, (2) understanding how mathematical ideas interconnect and build on one another to form a coherent whole, and (3) recognizing and applying mathematics in contexts outside of mathematics (NCTM, 2000). The operationalization of these indicators is presented in Table 3.

The test consisted of two contextual essay problems on the topic of ratio and proportion, each containing three sub-questions (a, b, and c). Sub-question (a) was designed to measure students' ability to identify relationships among mathematical concepts (direct and inverse proportion). Sub-question (b) measured students' ability to apply interconnected mathematical concepts in real-life contexts, such as school

Table 3. Indicators of mathematical connection ability

No	Indicator (NCTM-Based)	Operational Description
1	Recognizing and using connections among mathematical ideas	Students can identify and explain relationships among mathematical concepts, procedures, or representations (e.g., recognizing relationships between direct and inverse proportion).
2	Understanding how mathematical ideas interconnect and build on one another to form a coherent whole	Students can demonstrate how different mathematical concepts support one another in solving problems and explain their reasoning coherently.
3	Recognizing and applying mathematics in contexts outside of mathematics	Students can apply mathematical reasoning to real-life situations and relate mathematical concepts to scientific or social contexts.

entrepreneurship activities and community cooperation. Sub-question (c) assessed students' ability to connect mathematical reasoning with scientific concepts and everyday situasions.

To ensure objective and consistent scoring, students' responses were evaluated using an analytic scoring rubric aligned with the MCA indicators. The rubric assessed four main aspects: (1) accuracy of the mathematical model, (2) completeness and coherence of procedures, (3) correctness of the final result, and (4) clarity of demonstrated mathematical connections.

Table 4. Scoring rubric for mathematical connection ability test

Sub-question Type	Indicator Measured	General Scoring Criteria	Score Range
a (Problems 1 & 2)	Recognizing and using connections among mathematical ideas	Accuracy of model, correctness of procedure, and correctness of result	5–7–10–15
b (Problems 1 & 2)	Interconnecting concepts and applying them in real-life contexts	Accuracy of model, completeness of reasoning, correctness of result, and clarity of contextual explanation	5–7–14–20
c (Problems 1 & 2)	Applying mathematics outside mathematics	Correct calculation and ability to relate results to scientific or real-life contexts	5–7–10–15

For sub-questions with a maximum score of 15, four performance levels were applied (5, 7, 10, and 15). For sub-questions with a maximum score of 20, four performance levels were applied (5, 7, 14, and 20). Higher scores reflected more accurate reasoning, more complete procedures, and clearer demonstration of mathematical connections. The total maximum score of the MCA test was 100.

At the highest performance level, students demonstrated accurate mathematical modeling, complete and coherent procedures, correct results, and clear explanations of mathematical connections. At the second level, students generally applied appropriate models and obtained correct results, although their reasoning or explanations of the connections were less comprehensive. At the third level, students showed partial understanding, with appropriate initial modeling but incomplete procedures or minor computational errors. At the lowest level, responses reflected limited understanding, inaccurate modeling, or minimal evidence of mathematical connections.

The scoring process was conducted by one trained rater using the structured analytic rubric to ensure consistency and minimize subjectivity in evaluating students' responses.

Prior to implementation, the instrument was evaluated by experts in mathematics education to ensure content validity. The validation process examined the alignment between items and MCA indicators, the clarity of wording, the suitability of the contextual problems, and the appropriateness of the scoring rubric. Revisions were made based on expert feedback.

The reliability of the instrument was analyzed using Cronbach's Alpha based on pilot testing results. The analysis yielded a reliability coefficient of 0.791, indicating good internal consistency (á e" 0.70). Therefore, the instrument was considered valid and reliable for use in this study.

The Islamic Character (IC) questionnaire was used to determine the extent to which students' IC developed after participating in learning using a prophetic-approach-based student worksheet (LKPD). The questionnaire functioned as the primary quantitative instrument for measuring students' character development.

The assessment covered five main aspects: religiosity, siddiq (honesty), amanah (trustworthiness), tabligh (communicativeness), and fathanah (wisdom/intelligence) (Marlina et al., 2025). These aspects represent essential components of prophetic character. Each indicator was designed to reflect students' observable behavior during the learning process. The indicators of IC assessed through this questionnaire are presented in Table 5.

Table 5. Indicators of islamic character

No.	Aspect of Islamic Character	Behavioral Indicators
1	Religiosity	Praying before and after learning; dressing modestly; learning with confidence; considering learning as an act of worship; and demonstrating sincerity and trust in learning.
2	Siddiq (Honesty)	Not cheating; not providing false information; feeling guilty when being dishonest; and prioritizing correct processes over mere results.
3	Amanah (Trustworthiness)	Completing and submitting assignments on time; maintaining learning facilities; striving to provide complete and optimal answers; and feeling responsible for assigned tasks.
4	Tabligh (Communicativeness)	Demonstrating courage in expressing opinions or solutions; communicating politely; conveying information honestly; and sharing knowledge with peers.
5	Fathanah (Wisdom/Intelligence)	Organizing problem-solving steps logically; selecting effective and efficient strategies; understanding problem situations thoroughly; and seeking simpler and more effective alternative solutions.

The IC questionnaire was scored using a percentage scale. The results were categorized based on students' levels of IC development, as presented in Table 6.

Table 6. Criteria for assessing islamic character

Percentage Range	Assessment Category
81–100%	Highly Developed
61–80%	Well Developed
41–60%	Moderately Developed
< 40%	Less Developed

Because the study employed a pretest–posttest design and multivariate analysis, students' identities were recorded to allow matching of individual data across measurements. However, students were informed that their responses would be kept confidential and would not affect their academic grades. This procedure was intended to minimize potential social desirability bias.

To further strengthen the credibility of the IC measurement, supporting data were collected through structured classroom observations and limited interviews with selected students and the observing teacher. The observations focused on students' observable behaviors related to Islamic character during the learning process, while the interviews were conducted to obtain deeper insights into students' character development. These additional data sources were used to support and confirm the questionnaire findings through triangulation.

The IC questionnaire was validated by experts in Islamic education and mathematics education to ensure content validity. The validation results showed a 95% validity, which falls within the highly valid category; therefore, the instrument was considered appropriate for use.

Reliability was assessed using Cronbach's Alpha, yielding a coefficient of 0.950, indicating very high internal consistency (á e" 0.90). Thus, the questionnaire was deemed reliable and suitable for use in the study.

Data Analysis

Several data analyses were used in this study to evaluate how well the developed student worksheets (LKPD) met the expected levels of validity, practicality, and effectiveness. The validity analysis of the LKPD was conducted by examining expert assessments on the validation sheet. The validity value was obtained by calculating the percentage score for each indicator relative to the maximum score, then interpreting the results according to established validity criteria.

To analyze the practicality of the LKPD, the average percentage score obtained from the student-completed practicality questionnaire was calculated. The results were then categorized based on predetermined practicality criteria to determine the extent to which the LKPD could be effectively implemented in classroom learning.

In the final stage, the effectiveness of the LKPD was tested by comparing students' Mathematical Connection Ability (MCA) and Islamic Character (IC) between the experimental class using the prophetic approach–based LKPD and the control class using a conventional LKPD. The analysis employed Multivariate Analysis of Covariance (MANCOVA), with students' initial MCA and IC treated as covariates. This approach ensured that the analysis accurately reflected the intervention's impact on both dependent variables simultaneously. Prior to conducting the MANCOVA test, prerequisite tests were carried out, including tests of normality and homogeneity. The MANCOVA analysis was conducted only after these assumptions were satisfied.

The results of MANCOVA were interpreted by examining the F value, significance level (p-values), and effect size (ç²) to determine the magnitude of the intervention's effect. Through this analysis, it was identified to what extent the prophetic approach–based LKPD contributed to improving students' MCA while shaping their IC compared to the conventional (Santis et al., 2024; Suryani et al., 2025).

In addition to the quantitative analysis, qualitative data obtained from structured classroom observations and limited interviews were analyzed descriptively. Observation data were examined to identify the implementation of Islamic character values during learning activities, while interview responses were categorized into key themes related to students' character development. These qualitative findings were used **as** data triangulation to support and confirm the quantitative results of the IC questionnaire, thereby strengthening the credibility of the character assessment.

■ RESULT AND DISCUSSION

This section presents the study's findings, obtained through the development of a student worksheet (LKPD) based on a prophetic approach using the ADDIE model. The discussion is organized according to the stages of the ADDIE model analysis, design, development, implementation, and evaluation while simultaneously addressing the research questions concerning the validity, practicality, and effectiveness of the developed LKPD.

Analysis Stage

The analysis stage was conducted to identify the learning needs and existing problems in mathematics instruction at the madrasah. Based on initial classroom observations, students' MCA scores were relatively low, particularly in their ability to relate mathematical concepts to

everyday contexts. Many students had difficulty connecting ratio and proportion concepts to real-life problem situations, which affected their overall problem-solving performance.

In addition, interviews with several students indicated that the integration of IC values, such as religiosity, *siddiq*, *amanah*, *tabligh*, and *fathanah*, had not been systematically implemented in mathematics learning. Character formation tended to occur implicitly and was not yet integrated into structured learning activities. This condition suggests that mathematics instruction has not optimally facilitated the simultaneous development of cognitive competence and IC.

These findings highlight the need to develop instructional materials that not only emphasize conceptual understanding but also strengthen MCA while integrating IC values (Purwanti et al., 2021). In this context, a prophetic approach is considered appropriate as a foundation for developing the student worksheet (LKPD). The prophetic approach, which is grounded in the principles of humanization, transcendence, and liberation, provides a framework for integrating cognitive development with value-based character formation (Aghakhani et al., 2023; Aprilia & Munifah, 2022).

Design Stage

The design stage focused on developing a student worksheet (LKPD) based on a prophetic approach, aligned with the needs identified in the analysis phase. The worksheet was specifically designed to enhance students' MCA and IC simultaneously. The selected topic was equivalent and inverse proportion because this material offers strong opportunities to connect mathematical concepts to real-life contexts.

The design process involved aligning the LKPD with learning outcomes, specific instructional objectives, MCA indicators based on the connection standards proposed by the National Council of Teachers of Mathematics, and the identified indicators of IC. This alignment ensured that each activity within the LKPD systematically supported the targeted cognitive and character development goals. As a result, the worksheet was structured to promote meaningful, contextual learning experiences that foster both conceptual understanding and the internalization of values (Rahmi et al., 2020; Rafiepour & Faramarzpour, 2023).

The instructional content was organized progressively, beginning with conceptual exploration, followed by guided examples, and culminating in individual and group practice tasks. The LKPD explicitly integrates the three pillars of the prophetic approach humanization, transcendence, and liberation within learning activities. These pillars are embedded not only in the contextual problems presented but also in reflective components intended to strengthen students' spiritual awareness and moral reasoning (Sari et al., 2020).

Each unit of material was structured into three main components: the *Cahaya Wahyu* section, the *Ibrah* reflection activity, and contextual problem-solving tasks. These components were designed to facilitate conceptual understanding, reflective thinking, and the application of mathematical ideas in authentic contexts. Learning activities were implemented both individually and collaboratively to encourage interaction, responsibility, and communication skills.

In addition to designing the LKPD, several research instruments were developed at this stage, including expert validation sheets, a practicality questionnaire, an MCA test, and an IC questionnaire. These instruments were systematically constructed to ensure that the evaluation of the product's validity, practicality, and effectiveness would be methodologically sound and accountable.

Overall, the design stage demonstrates a structured effort to translate the identified instructional needs into a coherent learning

product. The subsequent development phase focused on refining and validating the designed LKPD to ensure its feasibility and effectiveness in the madrasah context (Saepudin et al., 2023).

Development Stage

During the development stage, the student worksheet based on the prophetic approach (LKPD) was constructed according to the design framework formulated in the previous phase. This stage aimed to operationalize the three pillars of the prophetic approach humanization, transcendence, and liberation into structured learning activities that integrate cognitive development with IC formation.

The LKPD structure consists of a cover page, instructions for use, learning outcomes and objectives, and core activity sections. The core activities are organized into three components: (1) *Cahaya Wahyu*, (2) *Ibrah*, and (3) Contextual Problems and Self-Reflection tasks. The development of the LKPD structure consistently emphasizes integrating prophetic values into mathematics learning, so that learning not only focuses on mastery of concepts but also fosters spiritual awareness and character development (Affandi et al., 2024).

To facilitate understanding of value integration, Figure 2 presents the structure of the *Cahaya Wahyu* component within the LKPD.

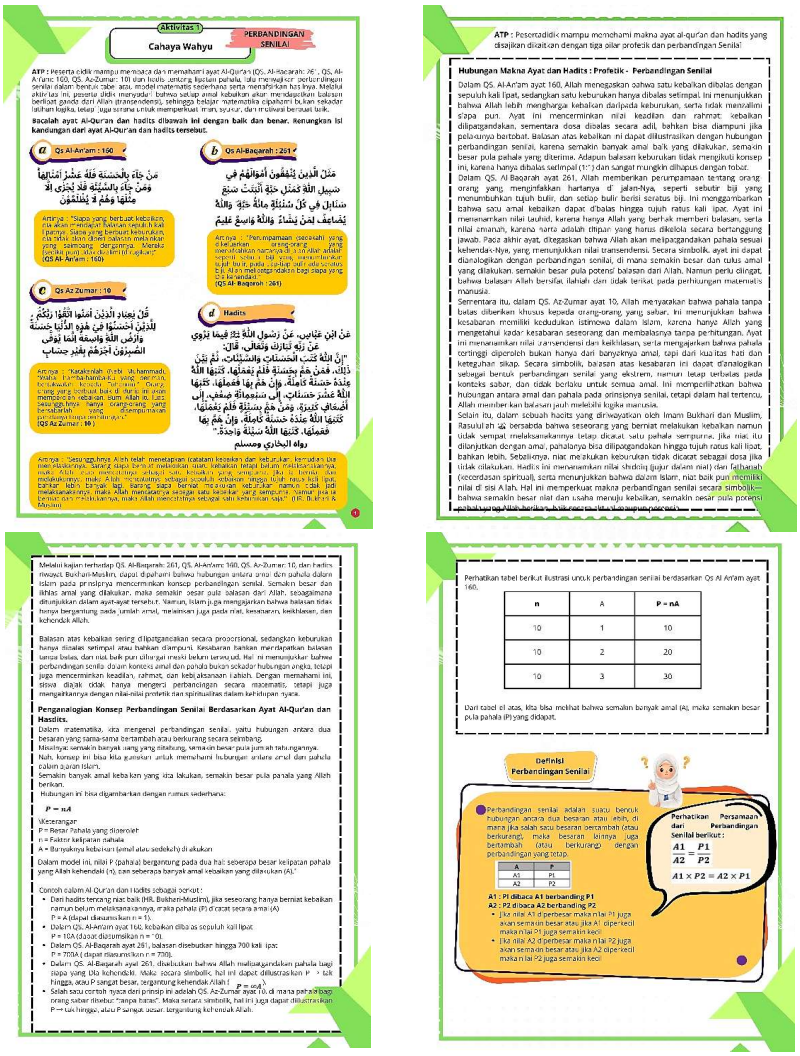


Figure 2. Integration of cahaya wahyu in LKPD activities

The *Cahaya Wahyu* page functions as a reflective foundation before students begin studying mathematical concepts. This section presents verses from the Qur'an or relevant hadiths that are thematically aligned with the topic of equivalent and inverse proportion. These texts are accompanied by explanations to help students understand their broader ethical and spiritual meanings.

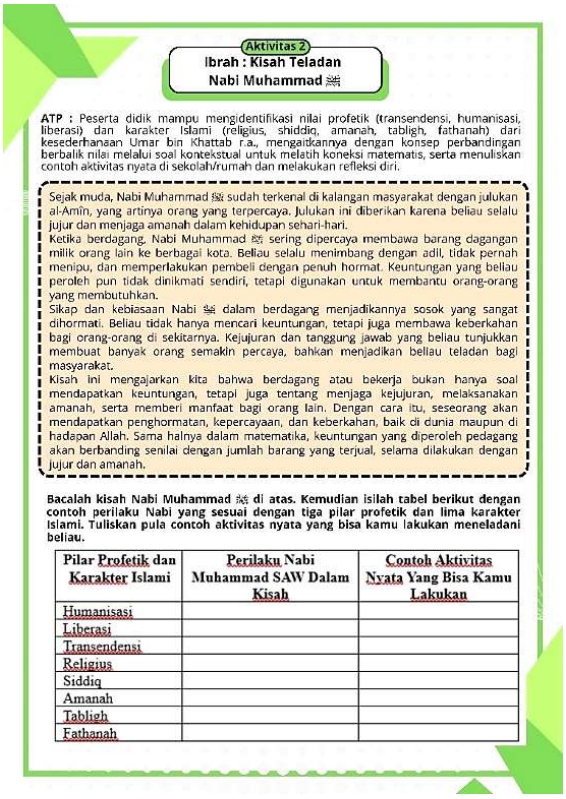
An analogy is included to support conceptual readiness toward proportional reasoning. However, the analogy is not intended to equate theological concepts directly with mathematical proportionality. In particular, the notion of multiplied rewards is not framed as a literal mathematical comparison. Instead, the analogy serves as a pedagogical bridge to stimulate reflective thinking and introduce structural similarities in reasoning.

To address potential pedagogical concerns, the LKPD explicitly emphasizes that divine rewards transcend quantitative human calculations. Thus, the analogy is positioned as a metaphorical entry point rather than a doctrinal equivalence. This approach is intended to avoid transactional interpretations of spirituality while maintaining meaningful contextual learning (Affandi et al., 2024).

The *Ibrah* section, shown in Figure 3, extends the reflective engagement initiated in the *Cahaya Wahyu* page.

This section presents narratives about the Prophet Muhammad SAW or his companions that are relevant to proportional reasoning. Students are guided to identify moral lessons and prophetic values reflected in the stories. They analyze how the pillars of humanization, transcendence, and liberation are manifested in the narrative context.

Furthermore, students identify IC traits demonstrated in the stories, including religiosity, honesty (*siddiq*), trustworthiness (*amanah*), communicativeness (*tabligh*), and intelligence


Aktivitas 2

Ibrah : Kisah Teladan Nabi Muhammad ﷺ

ATP : Peserta didik mampu mengidentifikasi nilai profetik (transendensi, humanisasi, liberasi) dan karakter Islami (religius, shiddiq, amanah, tabligh, fathanah) dari kesederhanaan Umar bin Khattab r.a., mengaitkannya dengan konsep perbandingan berbalik nilai melalui soal kontekstual untuk melatih koneksi matematis, serta menuliskan contoh aktivitas nyata di sekolah/rumah dan melakukan refleksi diri.

Sejak muda, Nabi Muhammad ﷺ sudah terkenal di kalangan masyarakat dengan julukan al-Amîn, yang artinya orang yang terpercaya. Julukan ini diberikan karena beliau selalu jujur dan menjaga amanah dalam kehidupan sehari-hari.
Ketika berdagang, Nabi Muhammad ﷺ sering dipercaya membawa barang dagangan milik orang lain ke berbagai kota. Beliau selalu menimbang dengan adil, tidak pernah menipu, dan memperlakukan pembeli dengan penuh hormat. Keuntungan yang beliau peroleh pun tidak dinikmati sendiri, tetapi digunakan untuk membantu orang-orang yang membutuhkan.
Sikap dan kebiasaan Nabi ﷺ dalam berdagang menjadikannya sosok yang sangat dihormati. Beliau tidak hanya mencari keuntungan, tetapi juga membawa keberkahan bagi orang-orang di sekitarnya. Kejujuran dan tanggung jawab yang beliau tunjukkan membuat banyak orang semakin percaya, bahkan menjadikan beliau teladan bagi masyarakat.
Kisah ini mengajarkan kita bahwa berdagang atau bekerja bukan hanya soal mendapatkan keuntungan, tetapi juga tentang menjaga kejujuran, melaksanakan amanah, serta memberi manfaat bagi orang lain. Dengan cara itu, seseorang akan mendapatkan penghormatan, kepercayaan, dan keberkahan, baik di dunia maupun di hadapan Allah. Sama halnya dalam matematika, keuntungan yang diperoleh pedagang akan berbanding senilai dengan jumlah barang yang terjual, selama dilakukan dengan jujur dan amanah.

Bacalah kisah Nabi Muhammad ﷺ di atas. Kemudian isilah tabel berikut dengan contoh perilaku Nabi yang sesuai dengan tiga pilar profetik dan lima karakter Islami. Tuliskan pula contoh aktivitas nyata yang bisa kamu lakukan meneladani beliau.

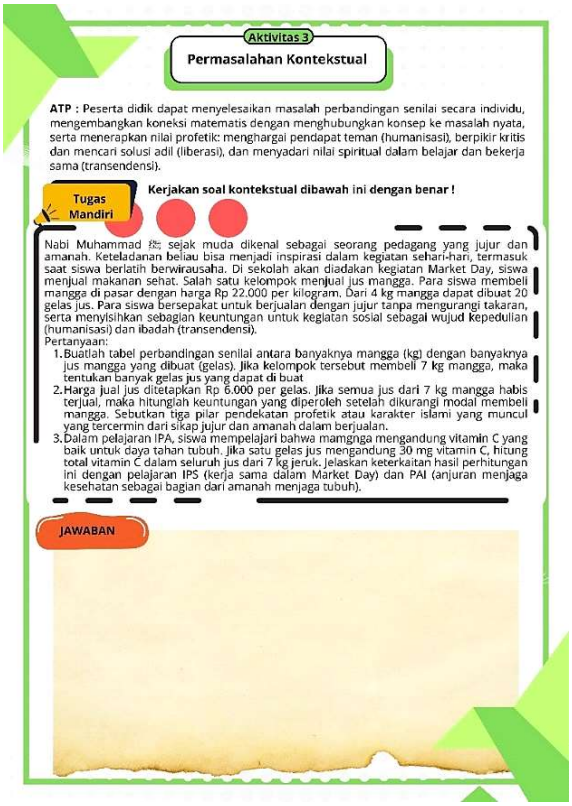
Pilar Profetik dan Karakter Islami	Perilaku Nabi Muhammad SAW Dalam Kisah	Contoh Aktivitas Nyata Yang Bisa Kamu Lakukan
Humanisasi		
Liberasi		
Transendensi		
Religius		
Siddiq		
Amanah		
Tabligh		
Fathanah		

Figure 3. Ibrah activity page

(*fathanah*). Students are also asked to provide examples of real-life situations that reflect these values. This reflective activity is designed to internalize values meaningfully rather than through doctrinal transmission.

After completing the reflective components, students proceed to the Contextual Problems page, as shown in Figure 4.

This page presents story-based mathematical problems designed to measure students' MCA. The questions address three indicators of MCA: connecting mathematical concepts within mathematics, relating mathematical concepts to everyday life, and connecting mathematical concepts to other disciplines. The contextual formulation of problems integrates prophetic values implicitly while maintaining mathematical rigor. Through this activity, students expected to develop analytical, reflective, and mathematical thinking skills.


Aktivitas 3

Permasalahan Kontekstual

ATP : Peserta didik dapat menyelesaikan masalah perbandingan senilai secara individu, mengembangkan koneksi matematis dengan menghubungkan konsep ke masalah nyata, serta menerapkan nilai profetik: menghargai pendapat teman (humanisasi), berpikir kritis dan mencari solusi adil (liberasi), dan menyadari nilai spiritual dalam belajar dan bekerja sama (transendensi).

Tugas Mandiri

Kerjakan soal kontekstual dibawah ini dengan benar !

Nabi Muhammad ﷺ sejak muda dikenal sebagai seorang pedagang yang jujur dan amanah. Keteladanan beliau bisa menjadi inspirasi dalam kegiatan sehari-hari, termasuk saat siswa berlatih berwirausaha. Di sekolah akan diadakan kegiatan Market Day, siswa menjual makanan sehat. Salah satu kelompok menjual jus mangga. Para siswa membeli mangga di pasar dengan harga Rp 22.000 per kilogram. Dari 4 kg mangga dapat dibuat 20 gelas jus. Para siswa bersepakat untuk berjualan dengan jujur tanpa mengurangi takaran, serta menyisihkan sebagian keuntungan untuk kegiatan sosial sebagai wujud kepedulian (humanisasi) dan ibadah (transendensi).

Pertanyaan:

1. Buatlah tabel perbandingan senilai antara banyaknya mangga (kg) dengan banyaknya jus mangga yang dibuat (gelas). Jika kelompok tersebut membeli 7 kg mangga, maka tentukan banyak gelas jus yang dapat di buat
2. Harga jual jus ditetapkan Rp 6.000 per gelas. Jika semua jus dari 7 kg mangga habis terjual, maka hitunglah keuntungan yang diperoleh setelah dikurangi modal membeli mangga. Sebutkan tiga pilar pendekatan profetik atau karakter islami yang muncul yang tercermin dari sikap jujur dan amanah dalam berjualan.
3. Dalam pelajaran IPA, siswa mempelajari bahwa mangga mengandung vitamin C yang baik untuk daya tahan tubuh. Jika satu gelas jus mengandung 30 mg vitamin C, hitung total vitamin C dalam seluruh jus dari 7 kg jeruk. Jelaskan keterkaitan hasil perhitungan ini dengan pelajaran IPS (kerja sama dalam Market Day) dan PAI (anjuran menjaga kesehatan sebagai bagian dari amanah menjaga tubuh).

JAWABAN

Figure 4. Contextual problems page

The initial LKPD product was evaluated by mathematics education experts. The assessment covered content suitability, language clarity, visual presentation, and compatibility with the prophetic approach. The validity result reached 85%, categorized as "very valid," indicating that the LKPD is appropriate for implementation with minor revisions. Subsequently, a limited trial was conducted in Class VII C to examine the practicality of the LKPD. The practicality test yielded a 90% score, categorized as "very practical," indicating that the LKPD is easy to use and well accepted in classroom learning.

In addition to validating the LKPD, the research instruments were systematically developed and tested. The MCA test was developed based on the predetermined indicators. Content validity was examined by mathematics education experts, who evaluated item relevance, clarity, contextual appropriateness, and alignment with learning objectives. Revisions were made according to expert feedback before the instrument was implemented. Reliability analysis using Cronbach's Alpha yielded a coefficient of 0.791, which falls into the reliable category, indicating acceptable internal consistency.

The IC questionnaire was validated by experts in Islamic education and mathematics education. The validation result reached 95%, categorized as highly valid.

Reliability testing using Cronbach's Alpha produced a coefficient of 0.950, indicating excellent internal consistency (á e" 0.90), in accordance with established reliability standards (Tavakol et al., 2011; Zakariya, 2022). These results indicate that the instruments are capable of producing consistent and dependable data for research analysis.

Overall, the development stage demonstrates that the LKPD based on the prophetic approach was systematically constructed, theoretically grounded, empirically validated, and pedagogically refined. The product fulfilled the criteria of validity and practicality, supported by reliable research instruments, thereby providing a strong foundation for the subsequent implementation and effectiveness testing phase.

Implementation Stage

The LKPD approach-based LKPD was implemented in Class VII A at MTs MINAT Kesugihan as the experimental group. Both the experimental and control classes were taught using the problem-based learning (PBL) model to ensure instructional consistency. The material on equivalent and inverse proportion was delivered over four class meetings.

In the experimental class, learning activities were structured around three components of the LKPD: *Cahaya Wahyu*, *Ibrah*, and contextual

problem-solving tasks. The teacher acted as a facilitator, guiding students in reflection, discussion, and conceptual exploration. Meanwhile, Class VII B served as the control group and used a conventional LKPD without integration of prophetic values, although the learning model and number of meetings were the same. This design allowed the effect of the prophetic-based LKPD to be examined more clearly.

Classroom observations indicated that students in the experimental class demonstrated higher engagement and more active participation during discussions and problem-solving activities. From a cognitive perspective, the *Cahaya Wahyu* component functioned as an affective-cognitive priming mechanism. By introducing meaningful and value-oriented contexts at the beginning of learning, students' attention and intrinsic motivation were enhanced, encouraging deeper conceptual processing rather than procedural execution.

The *Ibrah* activity strengthened this process through guided reflection. Students interpreted narratives, identified moral values, and related them to mathematical reasoning. This encouraged relational thinking and supported the development of interconnected conceptual schemas, which are fundamental to MCA. The contextual problems further reinforced situated cognition by requiring students to apply proportional reasoning in real-life scenarios, facilitating transfer across contexts.

Students' written responses in the Ibrah section also indicated that many learners could relate the moral lessons from the narratives to real-life situations. For example, several students mentioned that a trader should not only calculate profits but also allocate part of their income to charity. Other responses emphasized honesty and responsibility in daily interactions. These reflections suggest that students were not only engaging with the mathematical tasks but were also beginning to interpret and internalize the prophetic values embedded in learning activities.

From the perspective of character development, structured reflection and value articulation during problem-solving activities supported internalization processes. Instead of transmitting values directly, the LKPD encouraged students to interpret and apply them independently, fostering sustainable IC formation. These findings align with previous research indicating that reflective engagement enhances learning quality (Aghakhani et al., 2023). Meaningful contextual materials can simultaneously strengthen conceptual understanding and character development (Siregar & Surya, 2017).

The learning outcomes from both groups were subsequently analyzed in the evaluation stage to determine the effectiveness of the prophetic-based LKPD in improving MCA and students' IC.

Evaluation Stage

At the evaluation stage, the quality of the prophetic approach-based LKPD was assessed, with particular attention to whether it effectively improved the MCA and IC of madrasah students.

Formative evaluation begins with the validation of LKPD by experts in mathematics education. This assessment covers aspects of content, language use, integration of prophetic approaches, and the suitability of learning activities that reflect indicators of MCA and IC. This evaluation is conducted to ensure that LKPD is not only academically feasible but also in line with the learning objectives of madrasahs.

In addition, a limited trial was conducted in class VII C as a trial class to assess the practicality of using the prophetic approach-based LKPD and to test the reliability of the MCA test and the IC questionnaire instruments. Practicality assessment includes the readability of the material, ease of use by students, and clarity of the learning

activity flow. The results of this formative evaluation provide an initial overview of the product's strengths and weaknesses and a basis for refining the LKPD before implementation.

Summative evaluation was conducted after the implementation of the prophetic approach-based LKPD in the experimental class (class VII A) by comparing the pretest and posttest scores of MCA and the IC questionnaire results with those of the control class (class VII B), which used a conventional LKPD. Both classes applied the same learning model, namely problem-based learning (PBL). This comparison aimed to determine the extent to which the use of prophetic approach-based student worksheets (LKPD) contributes to improving the MCA and IC of madrasah students.

In the effectiveness analysis, to examine whether LKPD, based on the prophetic approach, can improve students' MCA and IC, a *Multivariate test was used. Analysis of Covariance* (MANCOVA) with *pretest scores* as covariates. However, before conducting the MANCOVA test, several prerequisite tests must be performed. These prerequisite tests include tests of data normality and homogeneity. This test was conducted to meet the statistical assumptions required for MANCOVA. Furthermore, Table 7 presents the results of the normality test for MCA data.

Table 7. Normality test of mathematical connection ability data

Group	Kolmogorov-Smirnov [a]			Shapiro-Wilk		
	Statistics	df	Sig.	Statistics	df	Sig.
Control Class Pretest	.146	33	.074	.948	33	.113
Control Class Posttest	.142	33	.089	.957	33	.216
Experimental Class Pretest	.088	36	.200 *	.953	36	.131
Experimental Class Posttest	.156	36	.026	.962	36	.249

Table 7 presents the results of the normality test for students' MCA. Based on the Shapiro–Wilk test, the significance values for both pretest and posttest scores in the control and experimental classes exceed 0.05, indicating that the data are normally distributed and meet the assumptions for parametric analysis. To complement the statistical results and provide a clearer picture of score distribution and individual changes, the pretest–posttest data were visualized using scatter plots.

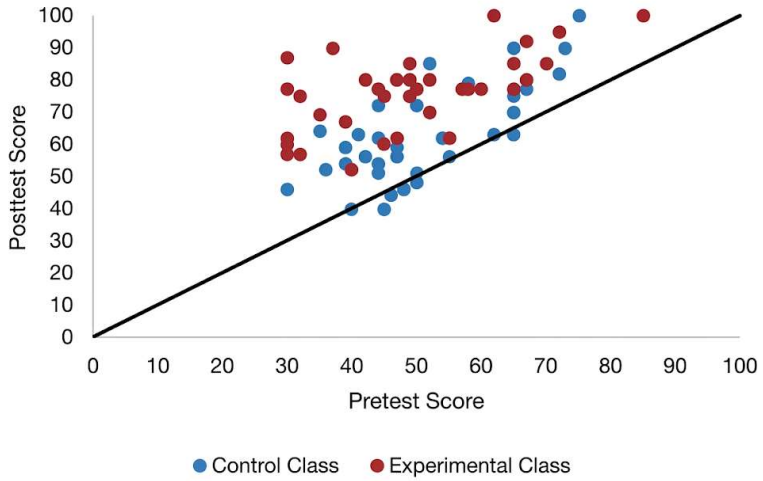


Figure 5. Scatter plot of pretest and posttest scores

Figure 5 presents a combined scatter plot comparing pretest and posttest scores of the control and experimental groups. The diagonal reference line (Y = X) represents equal pretest and posttest scores, where points above the line indicate improvement. Consistent with the previous separate visualizations, most students in both groups demonstrate score gains. However, the experimental group shows a more concentrated distribution above the diagonal line and at higher posttest score levels. In contrast, the control group's data points are relatively closer to the diagonal, indicating comparatively smaller improvements.

Furthermore, a normality test was also conducted on scores measured before and after the intervention within both groups, as presented in Table 8.

Table 8. Normality test of islamic character questionnaire scores

Group	Shapiro-Wilk		
	Statistics	df	Sig.
Control Class Pretest (Islamic Character Scores)	.959	33	.249
Control Class Posttest (Islamic Character Scores)	.983	33	.880
Experimental Class Pretest (Islamic Character Scores)	.949	36	.098
Experimental Class Posttest (Islamic Character Scores)	.961	36	.227

The normality test for the IC questionnaire scores before and after the treatment, as presented in Table 8, was conducted using the Shapiro–Wilk test. The results show that the significance values for the IC scores, before and after treatment, were greater than 0.05 in both the experimental and control classes. This indicates that all data are normally distributed, thus fulfilling the normality assumption. Furthermore, a homogeneity test was conducted on the MCA data and the IC questionnaire scores, as shown in Table 9.

Table 9. Homogeneity test of mathematical connection test scores and islamic character questionnaire scores between the control and experimental classes

Variable	Stage	Sig.	Description
Mathematical Connection Ability	Pretest	0.469	Homogeneous
Mathematical Connection Ability	Posttest	0.138	Homogeneous
Islamic Character	Pretest	0.749	Homogeneous
Islamic Character	Posttest	0.703	Homogeneous

The next prerequisite test is the data homogeneity test using Levene's test, as presented in Table 9. The significance values of Levene's test for the pretest and posttest scores of MCA and the IC questionnaire scores, both before and after the treatment, were above 0.05. This indicates that all data were homogeneous. By fulfilling the assumptions of normality and homogeneity, the MANCOVA test could be conducted to analyze students' MCA and IC while controlling for students' initial abilities. The results of the MANCOVA analysis are presented in the multivariate test shown in Table 10.

Table 10. Multivariate tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Group	Pillai's Trace	.923	383.045 [b]	2	64	.000	.923

In the multivariate test presented in Table 10, the Pillai's Trace value is significant at $p < 0.05$, indicating that class differences had a statistically significant multivariate effect on students' MCA and IC. The partial eta-squared value of 0.923 indicates a very large effect size for the use of the prophetic approach-based LKPD. This magnitude is exceptionally high for research in social and educational contexts and therefore warrants careful and critical interpretation. In addition, the initial MCA and IC scores, included as control variables, contributed significantly to the overall model, confirming that the observed differences were not merely due to prior ability.

These results suggest that integrating the prophetic pillars: humanization, transcendence, and liberation, into the LKPD was associated with improvements in both MCA and IC. The instructional design intentionally embedded value-based components into mathematical activities, enabling cognitive development and character formation to occur simultaneously within the same learning process.

Nevertheless, the interpretation of the exceptionally large effect size should be approached cautiously. The partial eta-squared value of 0.923 may indicate an inflation of the estimated treatment effect rather than a purely substantive impact. The very high partial eta-squared value may have been influenced by several contextual and methodological factors. First, the study was conducted in a pesantren-based madrasah with an already strong religious culture, which may have facilitated the internalization of prophetic values and amplified the observed impact on IC. Second, IC was measured using a self-report questionnaire, which may be susceptible to social desirability bias and relatively homogeneous responses. Third, the close alignment between the instructional design and the character measurement instrument may have statistically strengthened the observed effect. Taken together, these factors suggest that the reported effect size for IC should be interpreted with considerable caution and regarded as a potential overestimation of the intervention's true magnitude. Therefore, although the findings demonstrate a strong association between the intervention and the dependent variables, they should not be generalized broadly without careful consideration of contextual influences. Further research involving larger and more diverse samples is necessary to examine the stability and generalizability of these effects. Furthermore, the Tests of Between-Subjects Effects were conducted to assess the treatment's influence on MCA and IC, as shown in Table 11.

Table 11. Tests of between-subjects effects

Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig	Partial Eta Squared
Mathematical Connection Ability (Posttest)	3830.508	1	3830.508	36,317	.000	.358

Islamic Character (Posttest)	12184.021	1	12184.021	777,369	.000	.923

The results of the Tests of Between-Subjects Effects indicate that the treatment significantly influenced both dependent variables. For MCA, the partial eta squared value of 0.358 suggests a substantial effect, indicating that the prophetic-based LKPD meaningfully enhanced students' ability to relate mathematical concepts after controlling for prior knowledge.

In contrast, the effect size for IC ($ç^2$ = 0.923) was considerably larger. This discrepancy requires careful interpretation. The LKPD was explicitly designed to embed prophetic values humanization, transcendence, and liberation within each learning activity. As a result, the character dimension was directly and intensively stimulated throughout the instructional process, whereas MCA was strengthened primarily through structured problem-solving tasks.

Additionally, the religious school context and the use of a questionnaire-based character instrument may have contributed to relatively homogeneous posttest scores within the experimental group, thereby statistically amplifying the effect size for IC. The reliance on a self-report instrument combined with a homogeneous sample may have reduced variance within groups, which can mathematically increase partial eta squared values. Thus, the difference between the two effect sizes likely reflects variations in measurement structure, contextual alignment, and the intensity of value-based integration rather than inconsistency in the treatment effect itself. The inclusion of pretest scores as covariates further supports the conclusion that the improvements were associated with the structured implementation of the prophetic-based LKPD rather than initial group differences.

In addition to the quantitative findings, qualitative data from classroom observations and interviews provided converging evidence regarding the development of students' Islamic Character. Observation results indicated that most students demonstrated responsibility in completing tasks, cooperation during group discussions, honesty in presenting answers, and respectful communication when expressing opinions. The observing teacher confirmed that the learning process was structured and that value-based elements were meaningfully integrated into mathematical activities. Student interviews across different ability levels also reflected increased engagement, peer support, and awareness that learning can be connected to religious values. These qualitative findings serve as data triangulation, supporting the questionnaire results and strengthening the credibility of the character development outcomes in this study.

To further explore students' perceptions of the integration of prophetic value, a thematic analysis was conducted on several responses from the Ibrah and reflection sections of the LKPD. The analysis revealed three main themes. First, students demonstrated an understanding of prophetic values in everyday behavior, such as honesty, responsibility, and caring for others. For example, one student stated that *"a trader is willing to set aside part of his income to do good,"* indicating an understanding of the values of *amanah* and humanization. Second, students were able to relate mathematical activities to social and religious contexts. Some responses explained that trading activities involve not only calculating profits but also practicing charity and helping others. One student wrote that *"besides trading, we should set aside part of our wealth*

for charity," showing an awareness of the connection between mathematical calculations and Islamic teachings. Third, students demonstrated the ability to connect mathematics with other disciplines, such as economics and Islamic education. For instance, a student explained that trading activities relate to social studies concepts of buying and selling as well as Islamic teachings about charity. These findings suggest that the LKPD facilitated not only cognitive engagement with mathematical concepts but also reflective understanding of ethical and spiritual values embedded in the learning activities. This reflective engagement indicates that students not only completed mathematical procedures but also internalized the character values promoted through the prophetic learning approach, supporting the quantitative findings on the development of Islamic Character (IC).

These findings also relate to previous studies discussed in the introduction. Rahmawati & Rizki (2017) reported that teaching materials containing Islamic values can contribute to the development of students' character and positive learning attitudes. Similarly, Ulfa et al. (2023) demonstrated that contextual student worksheets can support improvements in students' ability to make mathematical connections. The results of the present study complement these two lines of research by integrating both dimensions within a single instructional design. While previous studies tended to focus either on character development through Islamic values or on enhancing mathematical abilities through contextual LKPDs, this study demonstrates that a prophetic approach-based LKPD can simultaneously support the development of mathematical connection ability and Islamic character. In this way, the present study helps bridge the gap between value-based education and cognitive mathematics learning in madrasah contexts.

Overall, these findings indicate that the developed prophetic-approach-based LKPD is valid, practical, and effective as an instructional tool that integrates mathematical learning with the internalization of Islamic values. However, the magnitude of the reported effect on Islamic Character should be interpreted with caution, given the methodological and contextual limitations discussed above. The simultaneous improvement in MCA and IC indicates the potential of the structured integration of humanization, transcendence, and liberation principles to support both conceptual understanding and character development.

While the results should be interpreted within the specific context of this study, they provide preliminary empirical support for the view that ethical–spiritual dimensions can be meaningfully integrated into mathematics learning rather than positioned as separate components. Therefore, this approach may offer a promising conceptual direction for mathematics education that seeks to balance higher-order thinking skills with character reinforcement.

One limitation of this study concerns the exceptionally high effect size reported for Islamic Character ($ç^2 = 0.923$). Although supported by statistical analysis and triangulated qualitative data, this magnitude is unusually large for social and educational research and may reflect an inflated estimate of the treatment effect. The reliance on a self-report instrument, the relatively homogeneous pesantren-based sample, and the close alignment between the instructional intervention and the character measurement indicators may have contributed to this overestimation. Therefore, findings related to Islamic Character should be interpreted with caution. Future research involving more diverse educational settings and alternative character assessment approaches is recommended to

obtain a more balanced estimation of the intervention's impact.

CONCLUSION

This study developed a student worksheet (LKPD) based on a prophetic approach that met the criteria of validity, practicality, and effectiveness for classroom implementation. The development of this LKPD represents an effort to update instructional tools in a way that potentially supports both cognitive and affective development simultaneously. This is reflected in the integration of prophetic values, humanization, transcendence, and liberation within each learning activity.

The findings indicate that, within the context of this study, the developed LKPD was associated with improvements in students' mathematical connection ability (MCA) and their Islamic Character (IC). The character-related findings were supported not only by quantitative analysis but also by qualitative triangulation through classroom observations and interviews. The madrasah setting, particularly one with a strong religious culture, provided a supportive environment for implementing the prophetic approach, thereby making learning activities more meaningful and contextually relevant.

Thus, the prophetic-approach-based LKPD may serve as an instructional tool that supports the integration of mathematical concept mastery and the internalization of Islamic values. However, given the sample's contextual specificity and the exceptionally large effect size observed for Islamic Character, the findings should be interpreted with caution. Further studies involving broader samples, more diverse educational settings, and alternative character assessment approaches are recommended to strengthen the generalizability and robustness of these findings. Future developments may also expand similar LKPD designs to other mathematical topics.

DECLARATION OF GENERATIVE AI USAGE IN THE WRITING PROCESS

During the writing of this manuscript, the author(s) used ChatGPT (OpenAI) to assist with language refinement and clarity of expression. The author(s) carefully reviewed and edited the content generated by this tool and take full responsibility for the accuracy and integrity of the final manuscript.

REFERENCES

Affandi, M. A., Ali, N., & Barizi, A. (2024). Model of students' prophetic character building of madrasah aliyah in responding to global sociocultural change era. *Al-Ishlah: Jurnal Pendidikan*, *16*(2), 991–1004. https://doi.org/10.35445/alishlah.v16i2.4218

Aghakhani, S., Lewitzky, R. A., & Majeed, A. (2023). Developing reflective practice among teachers of mathematics. *International Electronic Journal of Mathematics Education, 18*(4), 1–10. https://doi.org/10.29333/iejme/13715

Aisyah, S., & Usdiyana, D. (2022). A meta analysis study: Is problem based learning (PBL) effective toward students' mathematical connections ability? *Journal of Physics: Conference Series*, *2157*, 1–9. https://doi.org/10.1088/1742-6596/2157/1/012036

Al-Mutawah, M. A., Thomas, R., Eid, A., Yousef, E., Mahmoud, & Fateel, M. J. (2019). Conceptual understanding, procedural knowledge and problem-solving skills in mathematics: High school graduates' work analysis and standpoints. *International Journal of Education and Practice*, *7*(3), 258–273. https://doi.org/10.18488/journal.61.2019.73.258.273

Amalia, A. F., Sappaile, B. I., Minggi, I., Tahmir, S., & Arsyad, N. (2022). Description of

factors affecting students' mathematical connection. *International Conference on Educational Studies in Mathematics*, *611*, 138–144.

Aprilia, T. H., & Munifah. (2022). Manifestation of prophetic leadership values in Islamic education. *Tadbir: Jurnal Studi Manajemen Pendidikan*, *6*(2), 273–285. https://doi.org/10.29240/jsmp.v6i2.4896

Arum, K. (2018). *Pengembangan pendidikan agama Islam berbasis sosial profetik (analisis terhadap pemikiran Kuntowijoyo)* [Development of Islamic religious education based on social prophecy (analysis of Kuntowijoyo's thoughts)]. *Millah: Journal of Religious Studies*, *17*(2), 177–196. https://doi.org/10.20885/millah.vol17.iss2.art2

Azmi, C., Hadiyanto, & Rusdinal. (2023). National curriculum education policy "Curriculum Merdeka and its implementation". *International Journal of Educational Dynamics*, *6*(1), 303–309. https://doi.org/10.24036/ijeds.v6i1.437

Branch, R. M. (2009). *Instructional design: The ADDIE approach*. Springer.

De Santis, A., Sannicandro, K., Bellini, C., & Minerva, T. (2024). Trends in the use of multivariate analysis in educational research: A review of methods and applications in 2018-2022. *Journal of E-Learning and Knowledge Society*, *20*(1), 47–55. https://doi.org/10.20368/1971-8829/1135946

Diana, N., Suryadi, D., & Dahlan, J. A. (2020). Analysis of students' mathematical connection abilities in solving problem of circle material: Transposition study. *Journal for the Education of Gifted Young Scientists*, *8*(2), 829–842. https://doi.org/10.17478/jegys.689673

Fahrurrozi, Q. M., & Sokip. (2025). Implementation of character education based on Islamic values at Madrasah Tsanawiyah. *Urwatul Wutsqo: Jurnal Studi Kependidikan Dan Keislaman*, *14*(2), 345–362. https://doi.org/10.54437/juw

Giroux, H. A. (2021). Paulo Freire's pedagogy of hope revisited in turbulent times. *Postcolonial Directions in Education*, *10*(2), 280–304.

Irwanto, I., Susrianingsih, S., Habibi, H., & Ardat, A. (2023). *Manajemen lembaga pendidikan Islam di madrasah: analisis tentang model dan implementasinya* [Management of Islamic educational institutions in madrasas: analysis of models and their implementation]. *Fitrah: Journal of Islamic Education*, *4*(1), 162–174.

Jailani, J., Retnawati, H., Apino, E., & Santoso, A. (2020). High school students' difficulties in making mathematical connections when solving problems. *International Journal of Learning, Teaching and Educational Research*, *19*(8), 255–277.

Kartika, I., Noerlitasari, Saputra, A. M., Purwaningsih, Y., Yuningsih, A., Alimuddin, & Leman, S. (2025). *Integrasi nilai-nilai Islami dalam kepemimpinan pendidikan* [Integration of Islamic values in educational leadership].. *At-Tadris: Journal of Islamic Education*, *4*(2), 315–324. https://doi.org/10.56672/attadris.v4i2.427

Kenedi, A. K., Ahmad, S., Sofiyan, Ningrum, T. A., & Helsa, Y. (2019). The mathematical connection ability of elementary school students in the 4.0 industrial revolution era. *International Journal of Innovation, Creativity and Change*, *5*(5), 458–472.

Marlina, Y. A., Herlambang, Y. T., & Muhtar, T. (2025). *Urgensi pendidikan karakter berbasis pedagogik profetik: Sebuah pendekatan dalam menanggulangi krisis moral siswa* [The urgency of

character education based on prophetic pedagogy: An approach to addressing students' moral crisis]. *Ideguru: Jurnal Karya Ilmiah Guru*, *10*(1), 753–758. https://doi.org/10.51169/ideguru.v10i1.1424

Moreira Mora, T., & Espinoza Guzmán, J. (2016). Initial evidence to validate an instructional design-derived evaluation scale in higher education programs. *International Journal of Educational Technology in Higher Education*, *13*(11), 1–11. https://doi.org/10.1186/s41239-016-0007-0

NCTM. (2000). Four reactions to principles and standards for school mathematics. *Notices of the AMS*, *47*(9), 1072–1079.

OECD. (2023). PISA 2022 results: Country notes – Indonesia. *OECD Publishing*.

Purwanti, Mardiyana, & Indriati, D. (2021). The development of interactive multimedia based on mathematics to increase the mathematical connection ability in probability learning. *Journal of Physics: Conference Series*, *1808*, 1–8. https://doi.org/10.1088/1742-6596/1808/1/012047

Rafiepour, A., & Faramarzpour, N. (2023). Investigation of the mathematical connection's ability of 9th grade students. *Journal on Mathematics Education*, *14*(2), 339–352. https://doi.org/10.22342/jme.v14i2.pp339-352

Rahmawati, A., & Rizki, S. (2017). *Pengembangan bahan ajar matematika berbasis nilai-nilai Islam pada materi aritmatika sosial* [Development of Islamic value-based mathematics teaching materials in social arithmetic material]. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, *6*(1), 81–88. https://doi.org/10.24127/ajpm.v6i1.860

Rahmi, M., Usman, & Subianto, M. (2020). First-grade junior high school students' mathematical connection ability. *Journal of Physics: Conference Series*, *1460*, 1–7. https://doi.org/10.1088/1742-6596/1460/1/012003

Sari, D. N. O., Mardiyana, M., & Pramudya, I. (2020). Analysis of the ability of mathematical connections of middle school students in the field of algebra. *International Conference on Innovation In Research*, *1469*, 1–7. https://doi.org/10.1088/1742-6596/1469/1/012159

Sari, E. P., & Karyati. (2020). CORE (connecting, organizing, reflecting & extending) learning model to improve the ability of mathematical connections. *Journal of Physics: Conference Series*, *1581*, 1–7. https://doi.org/10.1088/1742-6596/1581/1/012028

Setiawan, Walidin, W., & Siregar, Z. A. B. (2025). Revitalization of Islamic values-based curriculum: Integration of religious education in mathematics learning. *Electronic Journal of Education, Social Economics and Technology*, *6*(2), 1–10. https://doi.org/10.33122/ejeset.v6i2.944

Siregar, N. D., & Surya, E. (2017). Analysis of students' junior high school mathematical connection ability. *International Journal of Sciences: Basic and Applied Research*, *33*(2), 309–320.

Spatioti, A. G., Kazanidis, I., & Pange, J. (2022). A comparative study of the ADDIE instructional design model in distance education. *Information*, *13*, 402. https://doi.org/10.3390/info13090402

Sugiyono. (2024). *Metode penelitian kuantitaif, kualitatif dan R&D* (2nd ed.). Alfabeta.

Sumarsih, Budiyono, & Indriati, D. (2018). Profile of mathematical reasoning ability of 8th grade students seen from communicational ability, basic skills,

connection, and logical thinking. *Journal of Physics: Conference Series*, *1008*, 1–10. https://doi.org/10.1088/1742-6596/1008/1/012078

Suryani, E., Prasetyo, Z. K., Hermanto, & Purwanti, K. Y. (2025). A comparative study of inquiry, STEAM, and STEAM-based guided inquiry (GI-STEAM). *European Journal of STEM Education*, *10*(1), 1–12. https://doi.org/10.20897/ejsteme/17191

Tavakol, S., Dennick, R., & Tavakol, M. (2011). Psychometric properties and confirmatory factor analysis of the Jefferson scale of physician empathy. *BMC Medical Education*, *11*, 54. https://doi.org/10.1186/1472-6920-11-54

Ulfa, D., Suanto, E., & Yuanita, P. (2023). *Pengembangan LKPD berbasis pendekatan kontekstual untuk memfasilitasi kemampuan koneksi matematis peserta didik SMP/MTs* [Development of LKPD based on a contextual approach to facilitate the mathematical connection skills of junior high school/Islamic junior high school students]. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, *12*(3), 3192–3200. https://doi.org/10.24127/ajpm.v12i3.7505

Zakariya, Y. F. (2022). Cronbach's alpha in mathematics education research: Its appropriateness, overuse, and alternatives in estimating scale reliability. *Frontiers in Psychology*, *13*, 1074430. https://doi.org/10.3389/fpsyg.2022.1074430