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Designing A Digital Islamic Education Textbook Based on Science Integration to Foster Students' Creative Thinking

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Abstract

This study aims to develop a valid, practical, and effective digital textbook for Islamic Religious Education (PAI) based on integrative science to enhance students' creative thinking skills. Using the ADDIE model, this research employed a Research and Development (R&D) approach. Data were collected through expert validation, teacher and student feedback, and response questionnaires. Validation results showed high validity: content expert (91.4%), media expert (94.2%), language expert (90%), and subject teacher (93%). Student responses indicated high practicality with an average score of 89%. Effectiveness was tested through pretest-posttest comparisons between experimental and control groups, analyzed using t-tests, normality, and homogeneity tests. Findings confirmed the textbook's high effectiveness. Additionally, student response scores (86.43) indicated a significant improvement in creative thinking skills. Overall, the integrative science-based digital textbook proved valid, practical, and effective in supporting creative thinking in Islamic Religious Education learning.

Keywords: *Digital Textbook for Islamic Religious Education, Integrative Science, Creative Thinking Skills*

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Introduction

Education is the primary instrument in developing superior human resources by fostering students' intellectual, spiritual, and life skills. It is not merely a process of knowledge transmission, but also a means of character formation and value internalization (Sagala, 2010). According to Law Number 20 of 2003, Article 1, education is defined as a conscious and planned effort to create a learning environment and process that enables learners to develop their potential actively.

In the 21st century, education must respond to the demands of a rapidly changing world by promoting critical, creative, and adaptive thinking. One promising approach is integrating scientific knowledge with religious values, often called the science-integrated approach (Abdullah, 2006; Barbour, 1990). This model encourages students to analyze issues from multiple perspectives, link abstract concepts to real-life contexts, and generate innovative ideas (Hasan, 2013: Mahzar, 1993).

Despite its relevance, science integration is rarely implemented in Islamic Religious Education (IRE). Topics such as halal and nutritious food are often treated as normative knowledge, leading to superficial understanding and limited application in students' daily lives (Mulyasa, 2013). This is evident in student behavior that disregards the halal-thayyib principles in food choices, favoring fast food and packaged snacks without considering their health and religious implications. Alarming data from the Indonesian Pediatric Association show an increase in acute kidney failure among children due to excessive consumption of food additives (Yanuarso, 2024). Such trends underscore the urgent need to frame halal consumption not only as a moral issue but also as a scientific and health-related concern (Andriani, L., Sari, D. N., & Prasetyo, 2023).

However, a gap remains between IRE content and students' real-life behavior. Conventional teaching methods and the limited use of contextual, science-based, and digital learning media exacerbate this disconnect (Rusman, 2012). Observations at SMPIT Al-Marjan revealed that IRE learning is still dominated by lecture-based instruction and printed textbooks. The science-integrated approach has not been applied, and project-based methods are rarely used (Interview with Turiski Liantara, 2024).

According to Skinner (1953), in behaviorist learning theory, student responses are shaped by relevant stimuli. To optimize learning, educators must present material that is engaging, meaningful, and aligned with students' cognitive and digital preferences. One strategy is to develop a digital textbook integrating Islamic teachings with scientific insights. This medium can enhance student understanding, promote creative thinking, and foster digital literacy (Arsyad, 2019; Nasution, 2021).

Previous studies on the development of digital learning materials for Islamic Religious Education (PAI) have primarily focused on enhancing student engagement, motivation, and learning outcomes through the use of technology (Arifin, 2021: Nurhasanah, S., Rahmawati, D., & Fauzi, 2022). While these studies demonstrate the effectiveness of digital platforms in delivering religious content, they often lack an integrative approach that connects religious teachings with scientific knowledge. Research by Sari, R. N., Putri, D. A., & Hartati (2020)For instance, a digital module on Islamic ethics was developed but did not incorporate scientific perspectives or target higher-order thinking skills such as creativity. Similarly, Nurhasanah, S., Rahmawati, D., & Fauzi (2022) designed e-learning materials for PAI, yet their focus remained limited to cognitive comprehension and moral reinforcement, without linking to interdisciplinary content.

This gap underscores the need for innovative learning resources that reflect a more holistic educational paradigm, especially in the context of 21st-century learning demands. The present study addresses this gap by developing a digital textbook that explicitly integrates Islamic values, particularly halal food, with scientific knowledge related to nutrition, health, and food safety. Moreover, this study is distinct in its focus on enhancing students' creative thinking skills, a competency often overlooked in religious education research.

The novelty of this research lies in its interdisciplinary design, combining PAI content with science education to foster meaningful learning and promote critical and creative thought. By targeting *halal and nutritious food*, the digital textbook reinforces religious understanding and equips students with scientific insights relevant to their daily lives—an approach rarely addressed in existing literature.

Creative thinking is an essential 21st-century skill for learners. According to Torrance (1974), creative thinking includes the ability to generate new ideas, think flexibly, and produce original solutions to problems. Science-integrated IRE learning is considered an effective medium to cultivate this potential.

Based on the above background, this study aims to develop a valid, practical, and effective science-integrated digital Islamic Religious Education textbook to enhance students' creative thinking skills at SMPIT Al-Marjan Nusa Indah, Bengkulu City. The problem-solving process is carried out through a Research and Development (R&D) approach using the ADDIE model, which is systematic, adaptive, and proven effective in instructional material development.

Method

This study employed a Research and Development (R&D) approach to develop a science-integrated digital textbook for Islamic Religious Education (IRE) to enhance students' creative thinking skills. The development model adopted was ADDIE, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation (Branch, 2009). This model was chosen due to its systematic and flexible nature in instructional media development. The study was conducted at SMPIT Al-Marjan Nusa Indah, Bengkulu City, during the odd semester of the 2024/2025 academic year.

The research subjects included IRE teachers, expert validators (content, media, and language experts), and Grade VIII students as the end-users of the textbook. The research began with a needs analysis stage involving observations, teacher interviews, and the distribution of questionnaires to students. The design phase involved constructing the content structure of the

textbook aligned with the curriculum and enriched with science-integrated elements. The development phase included creating digital media using Canva and validating the content through expert review. The product was then subjected to limited, broad-scale trials within the school environment. The implementation stage involved using the textbook in classroom learning to assess its functional feasibility.

The study employed three primary data collection techniques: observation, questionnaires, and tests, each supported by specific instruments tailored to the research objectives.

Observation Instrument is a structured observation sheet developed to monitor and record classroom activities while implementing the digital textbook. This instrument focused on student engagement, participation, interaction with the learning materials, and teacher-student dynamics. Observers used a checklist and field notes format to ensure systematic data collection aligned with active learning and creative thinking stimulation criteria.

Questionnaire Instrument: The questionnaire consisted of three sections designed to measure the *validity*, *practicality*, and *student responses* to the digital textbook. For validity, experts in Islamic Religious Education (PAI), instructional design, and digital media were asked to evaluate the content using a Likert scale-based rubric covering material relevance, scientific integration, language clarity, and media design. For practicality, the questionnaire was distributed to teachers to assess ease of use, clarity of instructions, and alignment with learning objectives. Student response questionnaires measured user experience, motivation, and interest through both closed-ended items and open-ended feedback prompts.

Test Instrument (Pre-Test and Post-Test) used to assess students' creative thinking skills, pre-tests and post-tests were administered using instruments based on validated indicators of creative thinking, including fluency, flexibility, originality, and elaboration. The test items were adapted from established models of creative thinking assessment and tailored to the context of Islamic Religious Education with integrative science themes. Subject experts reviewed the instruments to ensure content relevance and age-appropriate language.

An Expert Validation Instrument was used to ensure the quality of the developed digital textbook; an expert validation rubric was constructed. This rubric evaluated three domains: content accuracy, linguistic appropriateness, and media presentation. Each domain was scored using a 4-point Likert scale and accompanied by comment sections for qualitative suggestions. Experts'

input guided the revision and refinement of the textbook to meet academic and pedagogical standards.

Data analysis was conducted using both qualitative and quantitative methods. Qualitative data comprising expert suggestions, feedback, and observation notes were analyzed descriptively to identify the strengths and weaknesses of the product. Meanwhile, quantitative data from validation scores, questionnaires, and test results were analyzed using descriptive statistics as percentages. To determine the product's effectiveness, inferential statistical analysis was conducted, including normality testing, homogeneity testing, and an independent t-test between the experimental and control groups (Sugiyono, 2016). Effectiveness was determined based on a statistically significant improvement in post-test scores and students' creativity performance.

In conclusion, the R&D method with the ADDIE model was deemed appropriate for developing a science-integrated instructional media that is valid, practical, and effective. The success of the development was evaluated through three leading indicators: content and media validity, practicality of classroom implementation, and effectiveness in enhancing students' creative thinking skills, particularly in the IRE topic of halal and nutritious food and beverages.

Results and Discussion

1. Initial Condition of the Textbook

An analysis of the Islamic Religious Education (IRE) textbook published by Erlangga and used at SMPIT Al-Marjan revealed that the material is still incomplete and insufficient in addressing students' needs for developing creative thinking skills. Topics such as the definition of halal and haram food and consumption practices based on the Sunnah are not thoroughly presented. Furthermore, the learning activities in the textbook remain passive, lacking exploration elements or project-based learning components.

These limitations have negatively impacted students' engagement in the learning process. Instruction tends to be dominated by lectures and rote memorization, rather than learning activities that challenge students to think critically and creatively. This directly affects students' motivation and interest in participating in IRE lessons. Therefore, there is a need to develop a more contextual, interactive textbook that integrates a scientific approach to better align with the learning needs of today's students (Prastowo, 2015).

The need for meaningful and enjoyable learning experiences is a key consideration in developing relevant instructional media. Based on interviews with teachers and students, it was identified that students desire an informative textbook that connects religious values with scientific phenomena they encounter in their daily lives. In this regard, a science-integrated approach is considered an innovative solution to address these challenges.

On the other hand, technology in education continues to evolve and has become an inseparable part of students' lives. Consequently, the developed textbook is directed toward a digital format, allowing for flexible and engaging access. In addition to enriching learning content, a digital textbook is expected to increase student engagement through interactive features and visual elements that support their visual and kinesthetic learning styles.

2. Comparison of the Textbook Before and After Development

The textbook development process was carried out by considering several essential components, including learning objectives, content presentation, student activities, and assessment. A comparison between the pre-development and post-development textbooks is presented in Table 1 below:

Table 1. Comparison of the Textbook Before and After Development

Component	Before Development	After Development
Introduction	Preface and content sequence	Preface enriched with a science-integrated approach
Objectives	Focused on memorization and understanding of verses	Focused on understanding verse content, scientific concepts, and creative thinking skills
Content	Limited explanations and exercises	Divided into four chapters, complete with illustrations, verses, content analysis, and science integration
Assessment	Multiple choice and essay	Similar, but more applicable and project-based (PjBL)

The developed textbook content is based on an integrative approach, allowing religious material to be linked with relevant scientific concepts. For example, Islamic law and health and nutritional science viewpoints explain the importance of consuming halal and nutritious food.

The textbook design was also improved to enhance visual appeal. Elements such as color, illustrations, and layout were refined to stimulate students' reading interest. Visual aspects play an important role in increasing the practicality and attractiveness of textbooks, as Buzan (2010) highlighted in the concept of whole-brain learning.

3. Expert Validation of the Digital Textbook

Validation was conducted by four experts: a content expert, a media expert, a language expert, and an IRE teacher. The results indicated that all validators rated the product as "highly appropriate", with feasibility scores exceeding 90%. This validation process is essential to ensure the quality of the developed textbook's content, design, language, and pedagogical value.

Table 2. Validation Results of the Digital Textbook

Validator	Feasibility Score	Description
Content Expert	91.4%	Highly Appropriate
Media Expert	94.2%	Highly Appropriate
Language Expert	90.0%	Highly Appropriate
IRE Teacher	93.0%	Highly Appropriate

Feedback from validators included suggestions for improving the font size of Qur'anic verses, presenting tajwid examples, and clarifying student task instructions. These suggestions were implemented during the initial revision stage. In line with Huda, M., Jasmi, K. A., Hehsan, A., Basiron, B., & Mustari (2020), expert involvement in instructional media development significantly enhances learning effectiveness.

Validation was conducted using a structured questionnaire and open-ended feedback. The evaluation combined quantitative and qualitative approaches to provide a comprehensive product overview. This method supports quality assurance in the development of instructional materials (Kurnia, M. R. A., Hidayat, S., & Yulianti, 2022).

4. Practicality of the Textbook Based on Trial Implementation

The developed textbook underwent two stages of trial implementation: a small group trial involving 10 students and a large group trial involving 24 students. The results indicated that the science-integrated digital textbook achieved a practicality score of 86.8% in the small group trial and 89% in the large group trial. These results demonstrate that the textbook is practical and feasible for classroom implementation.

Figure 1. Comparison Between Initial Product Design and Final Product Outcome

These findings reinforce that the developed textbook is user-friendly and supports independent learning. Its interactive features, attractive illustrations, and clear activity instructions serve as significant points of engagement for students. This aligns with Mayer (2009) multimedia learning theory emphasizes the importance of combining text and visuals in enhancing learning outcomes.

Moreover, teachers stated that the textbook simplified the process of delivering instructional content. They were able to utilize the interactive elements to make the learning experience more engaging and contextualized. This practicality is a key indicator of the product's compatibility with real classroom conditions.

5. Effectiveness of the Textbook in Enhancing Creative Thinking Skills

The effectiveness of the textbook was tested using pre-tests and post-tests in both experimental and control classes. The results showed a significant increase in the average score of the experimental class, from 67.7 to 85.2, while the control class increased from 66.8 to 76.6.

Table 3. Average Pre-test and Post-test Scores

Class	Pre-test	Post-test	Difference
Experimental	67.7	85.2	+17.5
Control	66.8	76.6	+9.8

The t-test results indicated a significance value of 0.000 < 0.05, suggesting a statistically significant difference between the experimental and control

groups. Therefore, the science-integrated digital textbook was more effective than the conventional one. These findings support assertion regarding the importance of innovative instructional media in achieving 21st-century learning competencies.

The integration of IRE and science in the textbook helped students contextually understand the interconnection between disciplines. This stimulated the development of creative thinking skills, as reflected in the questionnaire results, which yielded an average score of 86.43%. These findings confirm the success of the integrative approach in promoting meaningful learning.

Conclusion

Developing a science-integrated digital Islamic Religious Education (IRE) textbook significantly transforms IRE learning into a more modern and contextualized approach. The findings of this study imply that integrating religious and scientific knowledge can holistically foster students' creative thinking skills. This textbook offers innovation in its content and delivery methods, which align with digital advancements and the learning needs of 21st-century students.

Although the results of validation and practicality tests indicate that the textbook is highly feasible for use, this study has certain limitations. One of the main limitations is the restricted implementation of the textbook in a single school and classroom, which does not fully reflect the generalizability of the findings. Additionally, the number of respondents and expert validators was limited, suggesting the need for further research involving schools with varied characteristics to assess the broader adaptability of the product.

This study's unique contribution lies in applying a science-integrated approach rarely employed in developing IRE textbooks. This integration enhances students' comprehension of religious teachings while improving their scientific literacy and critical thinking skills. Future research is recommended to expand the development of this digital textbook to broader subject areas and educational levels, and to incorporate interactive elements such as videos or online learning platforms to enrich students' learning experiences.

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