

Strengthening Students' Scientific Literacy Through the Integration of Basic Natural Sciences and Islamic Religious Education at Darud Da'wah Wal-Irsyad Islamic College Makassar

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Abstract

This study aims to analyze the implementation of the integration of Basic Natural Science and Islamic Religious Education, identify the level of students' scientific literacy, and examine the contribution of such integration to strengthening the scientific literacy of students at Darud Da'wah Wal-Irsyad Islamic College (STAI DDI Makassar). The study employed a quantitative approach using a descriptive survey method, supported by qualitative data obtained through observation, interviews, and documentation. The research subjects were students who had completed the Basic Natural Science and Islamic Religious Education courses. Data were collected through questionnaires, observations, interviews, and documentation, and then analyzed using descriptive statistics and qualitative analysis techniques consisting of data reduction, data display, and conclusion drawing. The findings revealed that the integration of Basic Natural Science and Islamic Religious Education was well implemented through the incorporation of scientific concepts with verses from the Qur'an and the Hadith, reflective discussion methods, and integrated learning materials. The level of students' scientific literacy was categorized as good, with an average achievement score of 82.4%. Students demonstrated the ability to explain phenomena scientifically, analyze environmental issues, interpret scientific data and evidence, and relate them to Islamic values. The integration contributed positively to strengthening scientific literacy, critical thinking skills, environmental awareness, and the development of students' religious character. The study concludes that the integration of science and religion is an effective learning approach for improving students' scientific literacy. Therefore, curriculum development and learning strategies based on the integration of science and religion should be continuously strengthened in Islamic higher education institutions.

Keywords: Scientific Literacy, Basic Natural Sciences, Islamic Religion Education, Integration, Students

INTRODUCTION

The rapid development of science and technology in the modern era requires higher education institutions not only to produce graduates with strong academic competence but also to develop individuals who are capable of understanding life phenomena scientifically, critically, and responsibly (Ankamah et al., 2021; Barnes et al., 2024). Scientific literacy has therefore become one of the essential competencies emphasized in contemporary higher education because it equips students to respond to increasingly complex scientific and societal challenges. Scientific literacy is not merely related to the mastery of scientific concepts but also encompasses an individual's ability to explain phenomena scientifically, interpret data, evaluate evidence, and make informed decisions based on scientific reasoning (Murti et al., 2024). This competence is essential for university students as future intellectuals who are expected to address various social, environmental, and technological issues through evidence-based thinking (Irwandi et al., 2025). Previous studies have consistently demonstrated that scientific literacy contributes significantly to the improvement of students' critical thinking, problem-solving abilities, scientific reasoning, and learning motivation, particularly in science-related courses, including Basic Natural Sciences (Listiani et al., 2022; Lubis et al., 2025).

The development of twenty-first-century higher education demands that students possess not only master of knowledge but also critical, creative, communicative, and collaborative skills (Care et al., 2022; González-Pérez & Ramírez-Montoya, 2022). In this context, scientific literacy becomes one of the key

competencies that must be developed because it is closely related to an individual's ability to understand, evaluate, and utilize scientific information to solve real-life problems (Murti et al., 2024; Irwandi et al., 2025). For students in Islamic higher education institutions, strengthening scientific literacy is increasingly important because they are expected to integrate academic competence with Islamic values in responding to increasingly complex social, environmental, and technological developments (Rahman et al., 2023; Hidayat et al., 2024). Furthermore, the integration of scientific literacy with Islamic values encourages students to develop evidence-based reasoning while maintaining ethical, moral, and religious perspectives when addressing contemporary issues (Nasution et al., 2022; Suryadi et al., 2024).

Within Islamic higher education institutions, the integration of science and religion is not merely an effort to connect two different fields of knowledge but rather an educational paradigm aimed at developing a holistic understanding of reality (Hidayatullah et al., 2021). Through such integration, students can recognize that scientific knowledge and religious teachings complement each other in explaining both natural and social phenomena. Therefore, learning Basic Natural Sciences integrated with Islamic Religious Education has the potential to become an effective means of fostering scientific literacy while simultaneously strengthening students' spiritual awareness (Budiyono et al., 2024).

Furthermore, STAI DDI Makassar, as one of the Islamic higher education institutions in Indonesia, possesses characteristics that support the development of integrative learning based on Islamic values. Nevertheless, the effectiveness of integrating Basic Natural Sciences and Islamic Religious Education in strengthening students' scientific literacy still requires more in-depth empirical investigation. This study is important because it not only seeks to describe the implementation of integrated learning but also examines its contribution to the development of students' scientific competencies in preparation for the dynamics of modern society.

On the other hand, higher education in Indonesia continues to face the issue of the dichotomy between religious sciences and general sciences. Islamic Religious Education is often taught within normative and textual frameworks, while science is generally understood as an empirical and rational discipline. This condition leads students to perceive religion and science as two separate entities. From the Islamic perspective, however, all knowledge originates from Allah SWT and serves the purpose of guiding humanity toward understanding His signs, both through the revealed verses (*ayat qauliyah*) and the signs found in nature (*ayat kauniyah*). This dichotomy remains a challenge within Islamic education because it results in a fragmented understanding of the nature of knowledge.

Basic Natural Sciences (BNS) occupies a strategic position in developing students' scientific thinking skills because the course examines various natural phenomena closely related to human life. However, learning practices in Islamic higher education institutions have not been fully directed toward integrating scientific concepts with Islamic values. Consequently, students often acquire theoretical scientific knowledge without gaining deeper spiritual insights into the natural phenomena they study. In fact, the integration of natural sciences and Islamic education can serve as a means of developing critical thinking, strengthen spiritual awareness, and build a holistic understanding of the relationship between humans, nature, and God.

Strengthening scientific literacy through the integration of Islamic Religious Education is essential because students are expected not only to understand scientific facts and concepts but also to view science as an instrument for reinforcing religious values. In this context, natural phenomena can be understood as part of Allah's signs in nature that encourage observation, investigation, and reflection on His greatness. Scientific approaches integrated with Islamic Religious Education are believed to foster students who possess a balance of intellectual, spiritual, and moral competencies. Several studies have emphasized that the integration of science and religion in learning can strengthen students' character and promote a more holistic educational paradigm that transcends the separation between worldly and religious knowledge.

Previous studies have demonstrated considerable attention to the integration of science and religion in education. Hajita (2024) argued that the paradigm of integrating religion and science in Islamic Religious

Education is necessary to overcome the fragmentation of knowledge that still exists within Islamic educational systems. The study emphasized the importance of learning processes that connect religious concepts with empirical realities. Likewise, Chafis (2024) asserted that the integration of science and religion in Islamic Religious Education constitutes a strategic effort to strengthen Islamic values while simultaneously providing opportunities for the balanced development of modern scientific knowledge. Furthermore, Kurniawati (2024) found that the implementation of scientific literacy in learning significantly improves students' critical thinking skills and learning quality.

Nevertheless, most previous studies have focused on the conceptual integration of religion and science, instructional material development, or learning implementation at the school level. Studies specifically examining the strengthening of scientific literacy through the integration of Basic Natural Sciences and Islamic Religious Education among students of Islamic higher education institutions remain limited. Moreover, research involving students of STAI DDI Makassar as research subjects is still scarce. Therefore, further investigation is needed to examine how the integration of Basic Natural Sciences and Islamic Religious Education contributes to strengthening students' scientific literacy.

Based on the foregoing discussion, this study aims to analyze the strengthening of scientific literacy through the integration of Basic Natural Sciences and Islamic Religious Education among students of STAI DDI Makassar. The study is expected to contribute theoretically to the development of the science–religion integration paradigm and to serve practically as a reference for lecturers in designing learning experiences that foster students' scientific competence, religious awareness, and balanced academic character in accordance with the demands of contemporary Islamic education.

METHOD

This study employed a quantitative approach using a descriptive survey design (Creswell & Creswell, 2023). The research was conducted at the Darud Da'wah Wal-Irsyad College of Islamic Studies (STAI DDI) Makassar during the even semester of the 2025/2026 Academic Year, involving 100 students who had completed the Basic Natural Sciences and Islamic Religious Education courses. The sample was selected using a purposive sampling technique based on students' participation in both courses. Data were collected through questionnaires, observations, interviews, and documentation. The questionnaire was used to measure students' scientific literacy levels and their perceptions of the integration of Basic Natural Sciences and Islamic Religious Education. Meanwhile, observations, interviews, and documentation were conducted to obtain supporting data regarding the implementation of integrative learning at STAI DDI Makassar (Taherdoost, 2022).

Data analysis was carried out using descriptive statistics, including percentages and mean scores, to describe the level of students' scientific literacy. Data obtained from observations, interviews, and documentation were analyzed through the stages of data reduction, data display, and conclusion drawing, following the interactive data analysis model proposed by Miles et al. (2020). The research cycle consisted of the planning, implementation, observation, and reflection stages, which were conducted systematically to obtain a comprehensive understanding of the effectiveness of integrating Basic Natural Sciences and Islamic Religious Education in strengthening the scientific literacy of students at the Darud Da'wah Wal-Irsyad College of Islamic Studies (STAI DDI) Makassar (Creswell & Creswell, 2023).

RESULTS AND DISCUSSION

Results

Implementation of the Integration of Basic Natural Sciences and Islamic Religious Education

The findings revealed that the integration of Basic Natural Sciences (BNS) and Islamic Religious Education (IRE) was implemented in the learning process at the Darud Da'wah Wal-Irsyad College of Islamic Studies (STAI DDI) Makassar. This integration was carried out by linking scientific content with relevant

verses from the Qur'an and the Hadith. Based on the questionnaire results, 86% of students stated that integrative learning helped them understand the relationship between scientific concepts and Islamic values. In addition, observation results indicated that lecturers consistently connected natural phenomena with Qur'anic verses related to nature (*ayat kauniyah*), making the learning process more contextual. These findings are consistent with previous studies indicating that the integration of science and Islamic values enhances students' conceptual understanding while strengthening their scientific literacy and religious awareness (Hidayaturrehman et al., 2021).

Table 1. Implementation of the Integration of Basic Natural Sciences and Islamic Religious Education in Learning

No.	Aspects of BNS and IRE Integration	Percentage (%)	Category
1	Linking scientific materials with Qur'anic verses and Hadith	86.0	Very Good
2	Use of scientific-religious discussion and reflection methods	84.7	Very Good
3	Relating natural phenomena to <i>ayat kauniyah</i>	88.3	Very Good
4	Lecturers' role in creating integrative learning	87.5	Very Good
5	Improvement of students' learning motivation	85.6	Very Good
6	Changes in perspectives regarding the relationship between religion and science	83.8	Good
7	Integration of Islamic values into course plans and teaching materials	86.9	Very Good
8	Development of students' critical and reflective attitudes	84.9	Very Good
Average		85.9	Very Good

Based on Table 1, the implementation of the integration of Basic Natural Sciences and Islamic Religious Education at STAI DDI Makassar was categorized as very good, with an average percentage of 85.9%. The highest score was found in linking natural phenomena with *ayat kauniyah* (88.3%), followed by the lecturers' role in creating integrative learning environments (87.5%). These findings indicate that lecturers play a strategic role in connecting scientific concepts with Islamic values, thereby making learning more contextual and meaningful.

Interview data showed that students experienced increased learning motivation after participating in courses that integrated BNS and IRE. Students not only gained an understanding of scientific concepts but also acquired spiritual insights into the meaning of the natural phenomena they studied. These findings suggest that integrative learning provides a more meaningful educational experience for students.

Beyond linking learning materials with Qur'anic verses and the Hadith, the integration of Basic Natural Sciences and Islamic Religious Education was also implemented through scientific-religious discussions and reflection activities. During the learning process, students were encouraged to analyze various natural phenomena, such as climate change, environmental pollution, and biodiversity, and then relate them to Islamic values the emphasize the importance of maintaining environmental balance. Through these activities, students not only understood the scientific aspects of these phenomena but were also able to identify the moral and spiritual values embedded within them.

Observation results further revealed that lecturers actively created integrative learning environments by encouraging students to view the Qur'an as a source of inspiration for the development of knowledge. For instance, when discussing topics related to the universe, lecturers connected scientific concepts with Qur'anic verses describing the creation of the heavens and the earth. This strategy encouraged students to recognize that scientific advancement does not contradict Islamic teachings but can instead serve as a means of strengthening faith and devotion to Allah SWT.

The findings also demonstrated that the integration of BNS and IRE positively influenced students' perspectives on the relationship between religion and science. Prior to participating in integrative learning, some students perceived these two disciplines as separate fields of knowledge. However, after attending the integrated courses, students began to understand that science and religion are closely interconnected in explaining various life phenomena. This shift in perspective serves as an important indicator of the success of the implementation of integrative learning at STAI DDI Makassar.

Furthermore, documentation analysis of Semester Learning Plans and teaching materials revealed systematic efforts to incorporate Islamic Religious Education values into Basic Natural Sciences content. Each learning topic included not only learning outcomes focused on the mastery of scientific concepts but also objectives related to the development of students' religious character. This finding indicates that the integration occurs not only during classroom instruction but has also been designed from the planning stage of the learning process.

To strengthen the findings obtained from observations, interviews, and documentation, the following table is presented.

Table 2. The Impact of BNS and IRE Integration on Students' Learning Experiences

No.	Perceived Impact on Students	Percentage (%)	Category
1	Understanding the relationship between science and Islam	86.0	Very Good
2	Increased learning motivation	85.6	Very Good
3	Gaining spiritual understanding of natural phenomena	87.4	Very Good
4	Improved critical thinking skills	83.9	Good
5	Increased participation in discussions	84.8	Very Good
6	Developing awareness as stewards (khalifah) of the earth	88.1	Very Good
7	Strengthening academic and religious character	86.7	Very Good
Average		86.1	Very Good

Based on Table 2, the implementation of BNS and IRE integration positively influenced students' learning experiences, with an average achievement score of 86.1%. The highest impacts were observed in students' awareness of their role as stewards (khalifah) of the earth (88.1%) and their increased spiritual understanding of natural phenomena (87.4%). These findings indicate that the integration of BNS and IRE not only strengthens students' cognitive abilities but also contributes to the development of their affective and spiritual dimensions, which are distinctive characteristics of Islamic higher education.

Ultimately, the integration of Basic Natural Sciences and Islamic Religious Education had broader impacts on students' learning experiences. Students became more active in discussions, more critical in analyzing natural phenomena, and more reflective in understanding their role as stewards of the earth. Therefore, the implemented integration serves not only as a learning strategy but also as an effort to simultaneously develop scientific and spiritual awareness, resulting in a more holistic educational process oriented toward the formation of academically competent students with stronger Islamic character.

Students' Scientific Literacy Level

The results of the questionnaire analysis indicated that the scientific literacy level of students at STAI DDI Makassar was categorized as good, with an average achievement score of 82.4%. The indicator of the ability to explain phenomena scientifically obtained an average score of 84.1%, the ability to evaluate and design scientific investigations scored 79.8%, while the ability to interpret scientific data and evidence reached a score of 83.3%.

Table 3. Scientific Literacy Level of STAI DDI Makassar Students

No.	Scientific Literacy Indicators	Percentage (%)	Category
1	Ability to explain phenomena scientifically	84.1	Very Good
2	Ability to evaluate and design scientific investigations	79.8	Good
3	Ability to interpret scientific data and evidence	83.3	Very Good
Average		82.4	Good

The results of observations and interviews revealed that students were able to relate scientific concepts to everyday life realities. They also demonstrated critical thinking skills in analyzing environmental phenomena and were capable of connecting them with Islamic values learned through Islamic Religious Education courses.

In addition to the quantitative achievement categorized as good, the findings also showed that students possessed a relatively high ability to identify problems related to environmental and social issues in their surroundings. They were able to explain various phenomena such as climate change, environmental pollution, waste management, and the utilization of natural resources by applying scientific concepts learned in the Basic Natural Sciences course. This ability indicates that students not only mastered theoretical knowledge but were also capable of applying scientific understanding to real-life problems faced by society.

Further interview findings revealed that learning based on the integration of Basic Natural Sciences and Islamic Religious Education helped students develop a more systematic and objective way of thinking. When confronted with a problem, students tended to seek information supported by data and factual evidence before drawing conclusions. At the same time, they considered ethical values and Islamic teachings when responding to various issues. This condition demonstrates that the scientific literacy developed among students is not solely oriented toward cognitive abilities but is also supported by moral awareness and social responsibility.

Table 4. Summary of Observation and Interview Findings on Students' Scientific Literacy

No.	Examined Aspect	Research Findings
1	Understanding of scientific concepts	Students were able to connect scientific concepts with everyday life.
2	Analysis of environmental phenomena	Students were able to critically analyze environmental issues.
3	Application of the scientific method	Students used data and factual evidence in solving problems.
4	Integration of Islamic values	Students were able to relate natural phenomena to Islamic values.
5	Environmental awareness	Students demonstrated concern for environmental preservation.
6	Scientific attitude	Students showed curiosity and actively sought scientific information.
7	Social responsibility	Students considered moral and ethical aspects when making decisions.

The findings also demonstrated that a good level of scientific literacy contributed to students' increased curiosity about natural phenomena and scientific developments. Students became more active in seeking additional references, participating in scientific discussions, and observing various phenomena occurring in their surroundings. Such scientific attitudes are important indicators of scientific literacy

development because they reflect students' ability to engage in lifelong learning, think critically, and continuously expand their knowledge. Therefore, the results of this study indicate that learning which integrates Basic Natural Sciences and Islamic Religious Education can support the development of students who possess both scientific competence and balanced religious awareness.

Contribution of the Integration of Basic Natural Sciences and Islamic Religious Education to Students' Scientific Literacy

The findings revealed that the integration of Basic Natural Sciences (BNS) and Islamic Religious Education (IRE) had a positive impact on strengthening students' scientific literacy. A total of 88% of respondents stated that the integration of these two courses helped them gain a more comprehensive understanding of natural phenomena. In addition, students demonstrated improved abilities in identifying problems, constructing scientific arguments, and making decisions based on empirical data and Islamic values.

Table 5. Contribution of the Integration of Basic Natural Sciences and Islamic Religious Education to Students' Scientific Literacy

No.	Contribution Aspects	Percentage (%)	Category
1	Helping students understand natural phenomena comprehensively	88.0	Very Good
2	Improving the ability to identify scientific problems	85.7	Very Good
3	Enhancing the ability to construct scientific arguments	84.5	Very Good
4	Supporting decision-making based on data and Islamic values	86.8	Very Good
5	Increasing environmental awareness	87.2	Very Good
6	Developing critical and reflective attitudes	83.9	Good
7	Strengthening academic and religious character	89.1	Very Good
Average		86.5	Very Good

The integration of Basic Natural Sciences and Islamic Religious Education also contributed to the development of a more holistic way of thinking among students. They no longer viewed natural phenomena solely from a scientific perspective but were also able to understand the philosophical and spiritual dimensions embedded within them. Through a learning process that connected scientific facts with Islamic values, students gained a deeper understanding of the relationship between humans, nature, and God. This understanding became an important foundation for developing scientific literacy that is oriented not only toward knowledge acquisition but also toward wisdom in the application of scientific knowledge.

Interview findings indicated that the integration of BNS and IRE increased students' awareness of the importance of environmental preservation as part of their religious responsibility. Students recognized that environmental issues such as pollution, ecosystem degradation, and the exploitation of natural resources are not merely scientific problems but also moral issues requiring solutions based on religious values. This awareness encouraged students to become more environmentally conscious and to adopt environmentally friendly behaviors in their daily lives.

Another important contribution was reflected in students' ability to develop arguments based on a combination of empirical evidence and ethical considerations. During discussions and presentations, students were able to express their opinions logically, supported by relevant scientific data, while simultaneously relating them to Islamic principles that promote the common good. This ability demonstrates that integrative learning has helped students develop higher-order thinking skills that are essential for addressing contemporary societal challenges.

Furthermore, the integration of BNS and IRE contributed to the development of a stronger academic character among students. They demonstrated critical, objective, and open-minded attitudes toward scientific advancements while maintaining a commitment to Islamic values as guidance for their actions. Therefore, strengthening scientific literacy through the integration of these two courses not only enhanced students' academic competencies but also fostered individuals who possess a balance of intellectual intelligence, spiritual awareness, and social responsibility. These findings confirm that the integration of science and religion is an effective approach for producing graduates of Islamic higher education institutions who are capable of responding to contemporary challenges without losing their Islamic identity.

Discussion

The findings of this study indicate that the integration of Basic Natural Sciences (BNS) and Islamic Religious Education (IRE) contributes positively to strengthening the scientific literacy of students at STAI DDI Makassar. These findings suggest that learning experiences that connect scientific concepts with religious values create more meaningful learning outcomes than fragmented learning approaches. Such integration helps students understand that science and religion share a common objective, namely developing human understanding of reality and the greatness of Allah SWT.

These findings are consistent with the study conducted by Hajita (2024), which argues that the integration of science and religion serves as a solution to the dichotomy of knowledge that still exists within Islamic education. Through an integrative approach, students are able to recognize the relationship between natural phenomena studied scientifically and the spiritual values contained in Islamic teachings. Consequently, the learning process is not solely oriented toward knowledge acquisition but also toward the development of religious awareness (Hajita, 2024; Yenida, 2025).

The high level of students' scientific literacy demonstrates that the integration of Basic Natural Sciences (BNS) and Islamic Religious Education (IRE) enhances students' ability to explain phenomena scientifically, evaluate information, and interpret empirical evidence. This finding supports the study by Kurniawati (2024), which states that science literacy-based learning can improve students' critical thinking and problem-solving skills. In the context of this study, these abilities are further strengthened through a religious approach that provides moral and ethical foundations for the application of scientific knowledge (Apriliana et al., 2024; Aripin et al., 2025).

In addition to cognitive aspects, this study found that the integration of Basic Natural Sciences (BNS) and Islamic Religious Education (IRE) contributes to strengthening students' character development. Students demonstrated responsibility, curiosity, and environmental awareness as manifestations of Islamic values in their daily lives. This indicates that scientific literacy developed through integrative learning encompasses not only knowledge and skills but also affective and spiritual dimensions. These findings are consistent with previous studies indicating that integrating Islamic values into science learning promotes students' responsibility, environmental awareness, and character formation while simultaneously strengthening affective and spiritual development (Fitriana et al., 2025; Amrullah et al., 2025).

The findings further reveal that the integration of Basic Natural Sciences and Islamic Religious Education creates a learning environment that is more contextual and relevant to students' needs. Learning activities that connect scientific concepts with real-life situations and Islamic teachings provide students with opportunities to gain a more comprehensive understanding of knowledge. This condition suggests that the learning process is not merely focused on knowledge transfer but also on developing ways of thinking that integrate academic, social, and spiritual dimensions simultaneously. These findings are consistent with recent studies indicating that integrative learning creates more contextual and meaningful learning experiences while fostering students' academic competence, collaborative skills, and the internalization of Islamic values (Herlina et al., 2025; Arizona et al., 2025).

From the perspective of Islamic education, the integration of science and religion represents an effort to restore the true purpose of knowledge as a means of recognizing the greatness of Allah SWT. Therefore, the integration of Basic Natural Sciences and Islamic Religious Education helps students understand that natural phenomena studied through scientific approaches are manifestations of Allah's signs that must be explored, preserved, and utilized responsibly. This understanding is essential for cultivating an academic generation that possesses a balance between intellectual and spiritual intelligence ([Firnanda et al., 2026](#)).

The findings also indicate that the integration of BNS and IRE contributes to the enhancement of students' reflective abilities. Students are not only capable of explaining phenomena based on scientific theories but are also able to reflect on the wisdom and values embedded within them. Such reflective ability is an important indicator in Islamic higher education because it encourages students to utilize knowledge as a means of self-development and service to society.

Furthermore, strengthening scientific literacy through integrative learning supports the development of twenty-first-century skills, including critical thinking, communication, collaboration, and creativity. Students who are accustomed to analyzing phenomena based on scientific evidence and Islamic values tend to be better prepared to address complex social challenges. They are not only oriented toward solving problems technically but also consider ethical, humanitarian, and sustainability aspects in every decision they make ([Rehman et al., 2024](#)).

The findings of this study have practical implications for the development of learning in Islamic higher education institutions. Lecturers should continue to develop learning strategies that encourage students to connect scientific concepts with Islamic teachings through discussions, case studies, learning projects, and simple research activities. In this way, the integration of science and religion becomes not merely a theoretical concept within the curriculum but a practice that is genuinely implemented in everyday learning processes.

Moreover, the results of this study indicate that strengthening scientific literacy through the integration of Basic Natural Sciences (BNS) and Islamic Religious Education (IRE) can serve as a relevant learning model for addressing the challenges of globalization and technological advancement. This model is capable of producing students who not only possess strong academic competencies and scientific literacy but also have solid moral, ethical, and spiritual foundations. Therefore, the integration of science and religion should continue to be developed as part of efforts to improve the quality of Islamic higher education while remaining responsive to contemporary developments without neglecting Islamic values ([Budiyono et al., 2024](#)).

Overall, the findings confirm that the integration of Basic Natural Sciences and Islamic Religious Education is an effective approach for enhancing students' scientific literacy. This approach can serve as an alternative learning model in Islamic higher education institutions to produce graduates who possess academic competence, scientific thinking skills, and strong religious character. Therefore, curriculum development and learning strategies based on the integration of science and religion should continue to be promoted in order to address the challenges of Islamic education in the modern era.

CONCLUSION

The findings of this study indicate that the integration of Basic Natural Sciences (BNS) and Islamic Religious Education (IRE) at STAI DDI Makassar has been effectively implemented through the incorporation of scientific concepts with verses from the Qur'an and the Hadith, the use of reflective discussion methods, and the development of learning activities that connect natural phenomena with Islamic values. This implementation has created a more contextual and meaningful learning process, enabling students to gain a more comprehensive understanding of the relationship between science and religion.

The study also revealed that the level of students' scientific literacy was categorized as good. Students demonstrated the ability to explain phenomena scientifically, analyze various environmental and

social issues, interpret scientific data and evidence, and relate them to Islamic values in their daily lives. In addition to enhancing critical thinking and problem-solving skills, integrative learning also contributed to the development of students' curiosity, environmental awareness, and a sense of social responsibility.

Overall, the integration of Basic Natural Sciences and Islamic Religious Education made a positive contribution to strengthening the scientific literacy of students at STAI DDI Makassar. This approach not only reinforced cognitive aspects through the mastery of scientific concepts and skills but also developed affective and spiritual dimensions through the internalization of Islamic values. Although this study was limited to a single institution, the findings demonstrate that the integration of science and religion can serve as an effective learning alternative for producing students who possess scientific competence, strong religious character, and balanced social responsibility.

ACKNOWLEDGMENTS

The authors express their deepest gratitude to Allah SWT for His blessings and mercy, which made the completion of this article possible. The authors would also like to extend their sincere appreciation to the Chairperson of STAI DDI Makassar and all members of the academic community for their support and facilities throughout the research process. Special thanks are addressed to the lecturers of the Basic Natural Sciences and Islamic Religious Education courses, as well as to all students of STAI DDI Makassar who participated as respondents and provided valuable contributions during the data collection process. The authors are also grateful to everyone who offered assistance, suggestions, and support, both directly and indirectly, in completing this research and this article. May all forms of support and cooperation receive abundant rewards from Allah SWT and contribute positively to the advancement of knowledge and education.

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