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Article

Exploring the Values of Integration of Islamic and Science Education: A Qualitative Approach in Contemporary Learning at Riau Islands High School

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Abstract: This study aims to explore and analyze the values of the integration of Islamic Religious Education (PAI) with science in learning in Senior High Schools (SMA) in the Riau Islands. In the era of globalization and rapid technological advances, it is important for education to integrate religious knowledge and science in order to create students who are not only intellectually intelligent but also have strong characters. The research approach used is qualitative descriptive with a case study method involving in-depth interviews, observations, and documentation studies in several high schools in the Riau Islands. This study found that despite major challenges in terms of limited infrastructure, human resources, and access to technology, the integration of PAI and science can enrich students' understanding of the relationship between religion and science. By integrating science into Islamic teachings, students not only learn scientific knowledge but are also trained to think critically in the context of religion and morals. On the other hand, geographical challenges and limited facilities in the Riau Islands cause gaps in the implementation of this integration. Therefore, this study suggests the need for more adaptive learning strategies, improved teacher training, and the use of mobile technology to overcome these challenges. This research is expected to contribute to the development of a more inclusive and relevant education curriculum, especially in remote areas such as the Riau Islands.

Keywords: Character Education, Integration of Islamic Education, Science.

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1. Introduction

Education in the era of globalization and technological advancement today faces major challenges in creating a young generation that not only has intellectual intelligence, but also has a strong character and good morals. One solution to overcome these challenges is to integrate Islamic Religious Education (PAI) and science in learning. In Indonesia, especially in Senior High Schools (SMA), this education plays an important role in shaping the character and personality of students, teaching deep religious values, while preparing them with scientific knowledge that is relevant to the development of the times.

Riau Islands, as a province consisting of many islands with remote geographical conditions, faces its own challenges in organizing education, including at the high school level. As an area with limited access to modern educational facilities and technology, the challenges faced by schools in the Riau Islands are much more complex. Although the national curriculum is geared towards educational renewal based on technology, gaps in facilities and resources remain a major obstacle in developing education that integrates religious values and science. Therefore, efforts to integrate PAI (Pendidikan Agama Islam) with science in learning at SMA Kepulauan Riau are highly relevant and urgent.

The integration of PAI with science is expected to produce a generation that is not only intellectually intelligent but also able to develop strong character, moral integrity, and the understanding that science and religion are not separate entities. In Islamic teachings, knowledge is seen as a means to draw closer to Allah, and therefore, it is crucial for students to understand the relationship between science and religion. The development of a holistic

character that integrates both will equip SMA students with a broader understanding of the world and the afterlife, making them individuals who are prepared to face global challenges in the future. .

However, integrating these two fields in learning at SMA in Kepulauan Riau is not an easy task. Systematic efforts are required to design a curriculum that not only combines scientific concepts with religious values but also addresses the limitations in facilities, human resources, as well as the cultural and social challenges in the region. Religious education, which tends to emphasize moral values, is often seen as separate from practical knowledge like science. Therefore, it is very important to explore in-depth how the values of integrating PAI and science can be applied within the educational context in SMA Kepulauan Riau to achieve a more balanced and relevant educational goal.

This study aims to explore more deeply the values of PAI and science integration in learning at Riau Islands Senior High Schools, and explore how this approach can be applied to create a generation that is not only superior in scientific knowledge but also has good character. Given the unique geographical, social, and economic conditions in the Riau Islands, this study also seeks to provide insights and recommendations related to the application of this integration approach in a local context that is in accordance with local educational needs.

2. Literature Review

In this study, the main objective is to explore the values that can be integrated between Islamic Religious Education (PAI) and science in the context of learning in Senior High Schools (SMA) in the Riau Islands. This integration-based education not only creates intellectual development, but also aims to form strong student characters based on religious and moral values. This research is very important considering the challenges in the Indonesian education system which must balance the progress of science and technology with the spiritual values taught in Islam.

Several related studies relevant to this topic have been conducted previously, especially those related to the integration of religious education with science. One study by Nasution and Suryani discusses the integration of PAI and science in the Indonesian education curriculum. This study found that although this integration can improve students' understanding of the relationship between religion and science, there are still major challenges in terms of effective curriculum implementation and limited resources, especially in remote areas.

Another study by Muhammad and Rosyadi highlighted the importance of building student character through religious education integrated with science, showing that the results of this integration help students not only understand scientific concepts but also appreciate moral and spiritual values in everyday life. Although the study provides many insights, it does not discuss its practical implementation in the context of education in areas with geographical challenges and limited infrastructure, such as the Riau Islands.

However, most previous studies have not specifically highlighted the differences in geographical and social contexts in the Riau Islands that may affect the implementation of integration between Islamic Religious Education and Science. Previous studies generally focus on curriculum integration in urban areas, assuming that supporting facilities and resources are adequate. In the Riau Islands, with more than a hundred islands spread out, geographical challenges, limited infrastructure, and disparities in access to education greatly affect the implementation of this integrative curriculum. Therefore, this study focuses on the local context in the Riau Islands and explores how schools in the area overcome the existing obstacles in integrating Islamic religious education with science in teaching.

Theories Used in understanding the implementation of PAI and science integration, several relevant educational theories, including constructivism theory and holistic education approach. Constructivism theory proposes that knowledge is built through interaction and experience, not just passively received. . In this context, the integration of PAI and science provides opportunities for students to construct their own knowledge by combining scientific knowledge and religious teachings. Holistic education, as explained by Gardner, emphasizes the development of all aspects of students, including intellectual, emotional, and spiritual. By integrating these two areas, education can form students who are not only intelligent in science but also have strong characters.

These theories suggest that the integration of PAI and science is not only aimed at improving students' academic understanding, but also at developing their moral character and faith. This study will explore how these two theories can be applied in learning in high schools in the Riau Islands, considering the unique local context.

This study aims to bridge the gap between previous research and the practical challenges faced by schools in the Riau Islands. By examining how PAI and science can be combined in teaching in remote areas, this study is expected to provide new insights into the implementation of an integrative curriculum that is more adaptive and relevant to local needs. Therefore, this study not only contributes in an academic context, but also practically for the development of more inclusive and holistic education in remote areas such as the Riau Islands.lain each theory in one sub-chapter.

3. Proposed Method

This study uses a descriptive qualitative approach to explore the values of the integration of Islamic Religious Education (PAI) and science in learning at Senior High Schools (SMA) in the Riau Islands. This approach was chosen because it allows researchers to describe the phenomenon in depth and comprehensively in a specific local context, as well as to understand the perceptions and experiences of education actors (teachers, students, and principals) in integrating the two fields.

This type of research is a qualitative case study, which focuses on an in-depth understanding of the process of integrating PAI and science in senior high schools in the Riau Islands. . This case study allows researchers to focus attention on real practices that occur in local schools, as well as the challenges and successes they experience in implementing the integration.

The subjects of this study involved several senior high schools in the Riau Islands, with a focus on PAI teachers, science teachers, principals, and students. The selection of subjects was carried out purposively, considering that they are parties directly involved in the process of implementing the curriculum that integrates PAI and science.

The data collection techniques used in this study are: (1) In-depth Interviews: Interviews were conducted with PAI teachers, science teachers, school principals, and several students selected based on specific criteria. The purpose of the interviews is to gather information about their experiences, challenges, and perspectives on the integration of PAI and science in teaching. In-depth interviews allow the researcher to explore more detailed and subjective information. (2) Participant Observation: The researcher will conduct direct observation in several classes that apply the integration of PAI and science. This observation aims to see how the teaching process takes place, how teachers integrate the two fields, and how students respond to this approach. By conducting participant observation, the researcher can understand classroom dynamics that cannot be obtained through interviews alone. (3) Documentary Study: The researcher will also collect documents related to the curriculum, syllabus, lesson plans, and evaluations used in the schools. These documents provide an overview of how the integration between PAI and science is planned and implemented within the context of formal education.

After identifying the main themes, the researcher will analyze the relationships between these themes and explore the factors influencing the implementation of PAI and science integration in learning. This analysis will provide a deeper understanding of how these two disciplines support each other in shaping students' character and developing 21st-century skills.

To ensure the validity and reliability of the data, this study will use triangulation techniques. Data triangulation will be conducted by combining various data collection techniques (interviews, observations, and documentation), and cross-checking between different data sources. Additionally, the researcher will perform member checking by seeking feedback from several participants about the preliminary findings obtained during the interviews to ensure the accuracy of the data interpretation.

After thematic analysis is completed, the results will be presented in the form of a descriptive narrative, illustrating how the integration of PAI and science is carried out in SMA Kepulauan Riau. The researcher will relate the findings from this case study to relevant theories regarding religious education and science, and propose recommendations to improve the future implementation of this integration.

This methodology is designed to provide a clear and in-depth picture of the challenges and opportunities in integrating PAI and science, as well as to suggest steps that can be taken to improve the implementation of an integrative curriculum in schools in Kepulauan Riau.

4. Results and Discussion

Integration of Islamic Education and Science in Senior High Schools

The integration of Islamic Religious Education (PAI) and science in learning in Senior High Schools (SMA), especially in the Riau Islands, is an important issue that needs more attention in order to create education that is not only oriented towards academic achievement, but also towards the formation of student character. Education in this contemporary era is faced with the challenge of developing students' cognitive abilities through science, while maintaining their moral and spiritual integrity. Integration between these two fields can be a solution for students to understand that science and religion, especially Islam, complement each other and are not contradictory.

This integration aims to unite two worlds that are often considered separate, namely the world of science and religious values. In Islam, science is seen as a revelation from God that should bring humans closer to Him. Therefore, science learning in the context of Islamic education needs to be oriented to help students understand how the creation of the universe and natural phenomena can reflect the greatness of God (Al-Qur'an, 2:164; 41:53). . Science is a means to deepen understanding of God's creation that can strengthen students' faith.

However, this integration does not only involve the integration of educational content between science and religion, but also involves the application of Islamic values in students' attitudes and behaviors. In this case, Islamic education does not only teach religious knowledge, but also equips students with moral values such as honesty, responsibility, and empathy which are very important in learning science and social interactions in everyday life.

Challenges in Integrating Islamic Religious Education (PAI) and Science in Senior High Schools in the Riau Islands

The integration of Islamic Religious Education (PAI) and science in Senior High Schools (SMA) in the Riau Islands has great potential to develop holistic understanding in students. However, in practice, the challenges faced are quite complex. One of the main challenges is the limited infrastructure and technology that supports learning. The Riau Islands, as an isolated archipelago, face obstacles in providing adequate educational facilities, especially those related to access to technology. Several schools in remote areas often do not have stable internet access, which is essential to support technology-based learning.

Limited internet access and computer devices in the Riau Islands hinder the implementation of a technology-first curriculum, which is an important focus in 21st-century education. Students in areas with limited access find it difficult to access digital learning resources such as e-learning, learning videos, or other technology-based educational platforms. In the context of integrating PAI and science, technology can be an important tool to enrich learning, by uniting scientific concepts with moral values in Islamic teachings. Without these facilities, such integration is difficult to achieve optimally.

In addition to the problem of access to technology, limited physical facilities such as classrooms, laboratories, and libraries are also obstacles to effectively integrating Islamic Religious Education and Science. Most schools in the Riau Islands, especially those on small islands, do not have adequate science laboratories or computer rooms needed for science and technology learning. This certainly makes it difficult for teachers to implement learning methods that integrate these two fields effectively, especially in teaching the practical skills and scientific experiments needed in science learning.

Human resources are also an important factor that is a challenge in integrating Islamic Religious Education and Science. Many teachers in the Riau Islands have not been trained in the use of technology to support digital-based learning. In addition, some Islamic Religious Education and Science teachers may not have sufficient understanding of the integrative approach that combines these two disciplines. Professional training is needed to improve teacher competence in teaching these two fields in an integrated manner. Without adequate training, teachers may have difficulty in designing and implementing learning that is in accordance with the vision of integrating Islamic Religious Education and Science.

Limited human resources and lack of teacher training in this regard are significant obstacles. Despite government efforts to improve the quality of education in remote areas, the limited number of competent teachers in remote areas greatly affects the quality of teaching. This leads to inequalities in achieving educational goals, especially in terms of

implementing a curriculum that integrates Islamic Religious Education and Science. Teachers who are untrained or less competent in both areas will find it difficult to facilitate effective integration, which in turn can hinder the development of critical and creative skills expected of students.

Overall, the main challenges in integrating Islamic Religious Education and Science in Senior High Schools in the Riau Islands lie in limited infrastructure, access to technology, and human resources. To overcome these challenges, collaboration between the government, educational institutions, and local communities is needed to improve educational facilities and access, as well as provide better training for teachers. These efforts are essential to ensure that the vision of educational integration that combines religious values and science can be achieved effectively in remote areas, such as the Riau Islands.

Integration in Curriculum and Learning in Riau Islands Senior High School

In the existing curriculum in Indonesia, Islamic Religious Education is integrated into a number of subjects that discuss morals and religion, while science is taught as a separate subject. However, this approach has begun to change by introducing a curriculum that places more emphasis on developing 21st-century skills, which integrate technical knowledge and character values. In Riau Islands Senior High School, this integration can be achieved through scientific projects based on religious values, such as science assignments that also take into account environmental impacts and social morality. For example, students can conduct research on environmental sustainability while examining whether the actions they learn are in accordance with Islamic principles regarding natural resource management.

One way to achieve this integration in Riau Islands Senior High School is through the implementation of scientific projects based on religious values. In this learning model, students are given the task of conducting research or scientific experiments that not only measure scientific results technically, but also take into account environmental impacts and social morality. For example, students can work on projects that study environmental sustainability while evaluating whether the actions they take or the principles they learn are in accordance with Islamic teachings regarding natural resource management and environmental protection. Projects like these teach students how to connect science with a greater moral responsibility towards nature and each other.

The implementation of this integration is very relevant to the goals of 21st-century education, which emphasizes the development of critical and creative skills among students. By emphasizing the development of these skills, the integration of Islamic Religious Education and Science can enrich students' learning experiences. 21st-century skills, such as critical thinking, problem solving, and the ability to work collaboratively, are essential in facing global challenges. Therefore, it is important for schools in the Riau Islands to not only focus on teaching science technically, but also introduce religious values that can guide students in making ethical decisions in their lives.

However, the implementation of a curriculum that integrates Islamic Religious Education and Science in Riau Islands Senior High Schools also faces major challenges. One of them is limited facilities and access to technology. In many schools in remote areas of the Riau Islands, limited infrastructure, such as lack of stable internet access or adequate laboratory facilities, hinders the implementation of a technology-based curriculum that integrates these two fields. Although the government is trying to improve the quality of education in remote areas, logistical and geographical challenges remain significant obstacles in providing learning that is equivalent to schools in urban areas. To overcome these challenges, a more adaptive and contextual approach is needed that takes into account local conditions and existing limitations. The use of mobile technology and application-based educational devices can be a solution to overcome the limitations of physical facilities and provide access to digital learning that is more easily accessible to students in remote areas. By increasing training for teachers to be better prepared to integrate Islamic Religious Education and Science in the teaching and learning process, as well as utilizing existing technology, it is hoped that this integration can run effectively and provide greater benefits for students in Riau Islands Senior High Schools.

Benefits of Integrating Islamic Religious Education (PAI) and Science in Contemporary Learning

The integration of Islamic Religious Education (PAI) and science in contemporary learning offers broader benefits than just scientific understanding. One of the main benefits is the development of holistic student character. Islamic education teaches moral values that are very important in shaping student character, such as honesty, responsibility, cooperation,

and empathy. By integrating these two fields, students are invited to not only understand scientific concepts in theory, but also develop deeper thinking about how science can be applied in their social and spiritual lives. This provides a new dimension in learning, which not only focuses on the cognitive aspect, but also the formation of student attitudes and behavior.

One of the benefits of this integration is that it helps students think critically and analytically in seeing the relationship between science and religion. For example, when students learn about natural phenomena, such as the creation of the universe or the cycle of life, they are not only studied from a scientific perspective, but are also taught to see it from a religious perspective that teaches that this universe is God's creation that must be protected and maintained. In this way, students are trained to question and reflect, and not just accept knowledge for granted. This process stimulates students to think more deeply about the meaning and purpose behind the knowledge they gain.

In addition, this integration introduces religious values into every aspect of students' lives, which in turn shapes their personalities. Islamic education provides moral guidelines that are essential for character development, where values such as honesty, responsibility, cooperation, and empathy are taught as part of everyday education. When these values are combined with science learning, students not only learn to become experts in the scientific field, but also learn to become responsible individuals, value cooperation, and have empathy for others. This integration-based education makes students more aware of their role in society and the world, and more able to contribute positively in a social context.

The integration of Islamic Religious Education and Science also provides opportunities for students to develop 21st-century skills, which are highly needed in today's modern world. Critical thinking skills, problem-solving skills, and the ability to adapt to technology and social change are essential for the younger generation. In an integrated curriculum, students not only learn science technically but are also equipped with character values that form a strong mental attitude to face life's challenges. This provides students with a balance between mastery of knowledge and personal character development, two aspects that are very important in shaping successful individuals in the future.

On the other hand, the benefits of this integration can also be seen in fostering a higher spiritual awareness of students. Science learning integrated with Islamic values helps students to see that science is not only a tool to understand the world, but also a means to get closer to God. By teaching them that science is part of worship and part of their quest to understand God's creation, students are expected to feel more responsible for this world, as well as more concerned about preserving nature and life as a whole. This leads to the formation of individuals who are not only intellectually intelligent but also wise and caring for others.

In conclusion, the integration of Islamic Religious Education and science in learning not only enriches students' scientific knowledge, but also provides deeper benefits in shaping their character. By equipping students with critical thinking skills, moral values, and spiritual awareness, this integration forms a generation that is not only competent in science, but also has a strong character, is ready to contribute positively to society, and understands the importance of balance between the world and the hereafter. This is an important step in creating a more holistic, relevant, and religiously-based education.

This study shows that despite the major challenges in implementing the integration of Islamic Religious Education and Science in Senior High Schools in the Riau Islands, especially related to infrastructure and human resources, this approach has enormous potential to improve the quality of education and character building of students. Therefore, it is very important to develop a curriculum that is more flexible and relevant to local needs in the Riau Islands, improve training for teachers, and provide better access to technology. Thus, the integration of Islamic Religious Education and Science can be a solution to produce students who are not only intelligent in science but also have noble characters and are ready to face future challenges.

5. Comparison

This study aims to explore and analyze the values of integration between Islamic Religious Education (PAI) and science in learning in Senior High Schools (SMA), especially in the Riau Islands. In the existing literature, there are several studies that also discuss the integration between religion and science, but differ in geographical context, methodology, and topic focus. For example, research by Nasution and Suryani suggests that the integration of PAI and science can improve students' understanding of the relationship between religion

and science, but this study focuses more on the context of education in big cities, not addressing infrastructure challenges and limitations in remote areas such as the Riau Islands.

Meanwhile, research by Muhammad and Rosyadi focuses more on character formation through the integration of Islamic education and science, but is limited to schools in urban areas with more adequate facilities. This study does not touch on how the integration of PAI and science can be applied in areas with different geographical and social challenges, such as those found in the Riau Islands.

This comparison confirms the existence of a research gap in the context of implementing the integration of PAI and science in areas with unique geographical and social challenges, such as those in the Riau Islands. This study focuses on providing an in-depth understanding of local challenges in the Riau Islands and how to overcome these obstacles to implement a more inclusive and holistic vision of education.

The different focus and objectives of this study emphasize a qualitative approach to explore the values of Islamic Religious Education and Science integration in the context of contemporary learning in Riau Islands Senior High Schools, using a case study method in an area with limited geographical and infrastructure challenges. Unlike Hidayat & Firdau's research which examines more theoretical aspects of religion and science integration without exploring its implementation in a specific local context, this study focuses on practice in the field, with primary data taken directly from the experiences of teachers, principals, and students in Riau Islands Senior High Schools.

The qualitative approach applied allows researchers to gain deeper insights into how Islamic religious education and science can be integrated practically, taking into account local challenges and limitations. The focus on the Riau Islands context provides an important contribution to enriching the literature on religion and science integration in remote areas.

The comparison of challenges in implementation in this study also discusses the challenges faced in implementing the integration of PAI and science, by highlighting geographical constraints, infrastructure, and access to technology in the Riau Islands. In this area, schools on small islands have difficulty in obtaining adequate facilities, such as sufficient classrooms, limited internet access, and a lack of learning technology.

This is very different from the research of As-Siddiqi & Noor which, although discussing the integration of religion and science, does not include infrastructure challenges in remote areas as one of the main focuses. Meanwhile, research by Yusuf & Farah identifies geographical challenges and logistical limitations in the implementation of education policies in isolated areas, but focuses more on the influence of education policies from the central level. This study, on the other hand, focuses on internal challenges in these schools, such as limited human resources, limited teacher training, and differences in perception regarding the importance of integrating science and PAI in education. .

The contribution to education in remote areas in this study fills the gap in the literature by providing practical solutions that can be applied in schools in the Riau Islands. The approach used offers concrete recommendations to address existing limitations, such as the use of mobile devices for technology-based learning and improving teacher training. This is different from the research of Zaky et al. which focuses more on the development of a national curriculum without considering the logistical challenges and resource constraints faced by schools in remote areas. .

In this regard, this study contributes new insights into the importance of a contextual approach in integrating Islamic Religious Education and Science in areas with unique geographic and social challenges. The focus on value-based education and local wisdom contributes to the development of a more inclusive and relevant education model.

In closing, this study offers a more holistic and contextual approach to understanding the integration of Islamic Religious Education and Science in learning in high schools in the Riau Islands. By using qualitative methods, this study provides a deeper perspective on the challenges and opportunities that exist in implementing the integration of religious education and science. Unlike previous studies, this study focuses on local needs and practical challenges faced by schools in remote areas, and provides more applicable recommendations to improve education in the area.

6. Conclusions

The conclusion of this study is that although Islamic Religious Education and Science are often viewed as two separate things, they actually complement each other in a holistic educational process. In the Riau Islands, the integration of these two fields can enrich students' understanding, both in terms of science and moral character. This study found that the implementation of the integration of Islamic Religious Education and Science can develop 21st-century skills in students, such as critical thinking, creativity, and problem-solving skills, while still instilling strong religious values in their lives.

However, this study also identified a number of major challenges in implementing this integration, such as limited educational infrastructure, limited access to technology, and lack of training for teachers in combining these two fields effectively. In remote areas of the Riau Islands, geographical issues also exacerbate the implementation, such as limited learning facilities that support technology-based learning and difficulties in accessing educational resources.

Nevertheless, a value-based approach that integrates Islamic Religious Education and Science has great potential to produce students who are not only intelligent in scientific knowledge but also have strong characters and noble morals. Therefore, a more adaptive learning strategy is needed, such as the use of mobile technology and increased teacher training, to overcome existing geographical and social challenges.

Recommendations from this study include the need for more flexible curriculum development, better teacher training, and increased access to technology to strengthen the implementation of PAI and science integration in Riau Islands Senior High Schools. This study also suggests that education policies in remote areas consider specific local conditions, taking into account cultural differences and the social needs of the local community.

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