

## **Integration of Theology and Science and Technology: Transforming Islamic Education Towards the Golden Generation of 2045**

### **Integrasi Teologi dan Ilmu Pengetahuan dan Teknologi (IPTEK): Transformasi Pendidikan Islam Menuju Generasi Emas 2045**

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#### **Abstract**

*The year 2045 marks the 100th anniversary of Indonesia's independence, which is anticipated to herald the emergence of a golden generation. This golden generation refers to Indonesian individuals who are excellent, accomplished, and competent in various fields of technology and science, contributing to transforming the Republic of Indonesia into a strong, advanced, significant, and sovereign nation on the international stage. However, the globalization era, characterized by rapid technological advancements and the massive flow of information, has created a disruptive environment posing significant challenges, particularly in Islamic education. This study aims to explain the integration of Islamic values through Islamic education to prepare a golden generation that remains resilient in spiritual values and does not lose focus amid advancements in science and technology (STEM). The study employs a library research method with content and descriptive analysis to examine the concept of this integration. The findings indicate that the integration of Islamic theology and STEM serves as a strategic approach to building a golden generation that is morally and intellectually robust. This study emphasizes the critical role of Islamic education as a foundation for shaping an outstanding generation capable of addressing contemporary challenges while maintaining their spiritual identity.*

**Keywords:** *Theology integration, science and technology integration, Islamic religious education, golden generation 2045.*

#### **Abstrak**

Tahun 2045 menandai 100 tahun kemerdekaan Indonesia, yang diharapkan menjadi momen lahirnya generasi emas bangsa. Generasi emas mengacu pada individu Indonesia yang unggul, berprestasi, dan kompeten di berbagai bidang teknologi dan ilmu pengetahuan untuk menjadikan Negara Kesatuan Republik Indonesia sebagai bangsa yang kuat, maju, besar, dan berdaulat di kancah internasional. Namun, era globalisasi yang ditandai dengan kemajuan teknologi dan masifnya arus informasi menciptakan disrupsi yang menjadi tantangan serius, khususnya dalam Pendidikan Islam. Penelitian ini bertujuan untuk menjelaskan peran integrasi nilai-nilai Islam melalui Pendidikan Islam dalam menyiapkan generasi emas yang tetap kokoh dalam nilai spiritual dan tidak lalai dengan kemajuan ilmu pengetahuan dan teknologi (IPTEK). Penelitian ini menggunakan metode studi pustaka (*library research*) dengan analisis konten dan deskriptif untuk mengkaji konsep integrasi tersebut. Hasil penelitian menunjukkan bahwa integrasi antara nilai-nilai teologi Islam dan IPTEK menjadi langkah strategis dalam membangun generasi emas yang tangguh secara moral dan intelektual. Penelitian ini menegaskan pentingnya Pendidikan Islam sebagai fondasi untuk mencetak generasi unggul yang mampu menjawab tantangan zaman tanpa kehilangan identitas spiritual.

**Kata Kunci:** Integrasi teologi, integrasi IPTEK, pendidikan agama islam, generasi emas 2045.

## **1. Introduction**

The term "generation" in the Big Indonesian Dictionary is defined as a group of people who live in the same relative time, who form a generation and descendants or a parallel life span. In simple terms, generation can be interpreted as a period in which groups of individuals have distinctive characteristics that can distinguish them and provide a special identity that plays a role in the dynamics of historical or epochal change (Kurnialoh, 2022). According to Notosusanto, a generation is defined as a core group that serves as a model for the society of its time, which in a social context is considered a leader or at least a pattern setter of its time. Meanwhile, the term "gold" refers to a yellow precious metal that is easy to shape and symbolizes something of high quality, preciousness, and value.

In the era of globalization, which is marked by the rapid development of science and technology (IPTEK), humans face various complex problems in terms of social, political, economic, and cultural aspects. Science and technology bring significant changes in the way humans live their daily lives (Ainun et al., 2024) ranging from communication, transportation, health, education, and even understanding of the existence of the universe. One of the biggest challenges of the advancement of science and technology (IPTEK), especially in this digital era, is the massive news on the internet, influence on social media, and also artificial intelligence (AI). Without clear ethical guidelines, technological developments can damage social and environmental order.

Islam requires its followers to study and develop science as a form of practicing the teachings of Islam itself (Mahrisa, 2022). However, along with the many benefits offered, the development of science and technology also raises various problems (Richiyanti, 2020). Science and technology require clear direction so that they are not misused or have a negative impact on humans and nature.

This is where the role of Islamic theology is not just a study of belief and worship, but also includes how Islamic values are integrated into human life in various aspects. As a source of moral and ethical values, Islamic theology is also expected to be able to provide a spiritual foundation that guides humanity in the responsible use and development of science and technology, because Islam and science and technology are not dichotomous (Mas'ud, 2020). In addition, Islamic education plays a role in bridging the integration between theology and science and technology so that the golden generation is not only able to face the challenges that exist with technological advances, but also has integrity. Therefore, this research will discuss the Integration of Theology and Science and Technology: Transformation of Islamic Education Toward the Golden Generation 2045.

## **2. Literature Review**

### **2.1. Challenges of Islamic Education Learning in the Digital Age**

According to (Dewi Fitriani, et al. 2021) theology is an attempt to contextualize religious teachings in order to be able to answer various human problems that not only concern matters of faith and divinity, but also cultural issues and daily life that continue to develop. Theology in Islam becomes more meaningful if it is connected to Islamic values, so it includes proving the truth of belief through rational and religious arguments. Education in the perspective of Islamic theology is understood as a process of interaction between humans and the environment aimed at developing skills and attitudes to improve human conditions and the environment. Therefore, the

theological concept of education in Islam rests on critical reasoning towards God, the messages of revelation, and His attributes, which are then integrated into the educational process. Islamic education is directed at shaping individuals into pious servants of God, with the main foundation in the Qur'an and Hadith. Theology of education also functions as a paradigm for building an education system based on divinity, humanity, and cosmology, which aims to form a complete Muslim personality, both spiritually and socially.

## **2.2. Islamic Education in the Digital Age**

Islamic education in the digital age offers great opportunities, such as global access to religious learning resources, interactive learning methods, and more inclusive knowledge dissemination (Hajri, 2023). Digital technology allows young people to utilize online platforms, apps and social media to deepen religious understanding. It also supports engaging and interactive multimedia-based learning, such as videos and animations. Digital literacy is key to ensuring that technology is used effectively and responsibly, by instilling critical thinking skills and internet etiquette. However, challenges also arise, such as maintaining the authenticity of the content, addressing the technology accessibility gap, and ensuring the integration of a curriculum that is in line with Islamic principles. The digital divide, especially in remote areas, hinders equitable access to education. Therefore, cooperation between educational institutions, the government and the private sector is needed to overcome these barriers. With a digital literacy-based approach and curriculum innovation, Islamic education can continue to be relevant and have a significant positive impact in the digital age.

## **2.3. Golden Generation 2045**

The Golden Generation 2045 is a term that describes the hope for the presence of an Indonesian generation that is superior, productive, characterized, and has global competitiveness at the age of 100 years of Indonesian independence (Hamdani, et al. 2022). This generation is expected to play a role in building a strong, sovereign, and advanced nation in various fields, especially technology and science. This concept emphasizes the importance of character education from an early age as a foundation to form individuals with noble personalities, Pancasila values, and high intellectual abilities. This character education includes religious values, honesty, hard work, and love for the country, which are integrated into the curriculum and school culture.

## **3. Research Methods**

This article uses the literature study method as a data collection approach, through analyzing and understanding theories from various literatures related to the research topic. The literature study was carried out in four main stages: preparation of research tools, preparation of an initial bibliography, effective time management, and the process of reading and recording relevant information for the research. Data collection was done by tracing and compiling information from various reference sources, such as books, scientific journals, and previous research. The analysis methods used included content analysis and descriptive analysis to ensure comprehensive and reliable results. Literature sources obtained from various credible and diverse references were critically and deeply analyzed thoroughly to strongly support the propositions, arguments, and innovative ideas put forward.

## 4. Results and Discussion

### 4.1. Challenges of Islamic Education Learning in the Digital Age

Islamic education in the digital era faces significant challenges along with rapid technological advances. One of the main challenges is maintaining a balance between the delivery of deep religious values and the use of modern technology. Digital technology offers various conveniences, such as faster and more diverse access to information, but it is not uncommon for the content available in cyberspace to contain misinformation or even contradict Islamic teachings. Teachers and educators need to be more selective in choosing learning resources so as not to rely solely on the internet without considering the accuracy and validity of the information (Aziz & Zakir, 2022).

In addition, the adaptation of learning methods is another challenge in PAI in the digital era. Traditional methods that have relied on face-to-face and direct interaction need to be changed and adapted to online learning. The teaching process, which is usually rich in in-depth discussions, recitation of the Qur'an, and worship practices, needs to be integrated with technology that supports remote interaction. However, not all educators or learners are ready for this change. Lack of understanding of technology for some teachers can also hinder the effectiveness of learning (Gunarsih, 2023).

Another challenge that arises in the digital era is the influence of social media on religious understanding. Social media is often the main means by which young people seek information, including about religion. However, without proper guidance, they can be exposed to less valid or even deviant teachings or views. The spread of hoaxes and unverified information is a serious problem in the context of religious learning in the digital era. Therefore, PAI educators have the duty to equip students with good digital literacy so that they are able to filter the information they get.

Islamic education in the digital era faces increasingly significant challenges when linked to the concept of iman bi al-ghaib - belief in the unseen, which is the theological foundation of Islam. One of the main challenges is the reliance on technology that focuses on empirical and measurable things, while iman bi al-ghaib teaches belief in things that are beyond the reach of the five senses, such as the existence of Allah, angels, the afterlife and destiny. Technology tends to provide tangible and factual experiences, making it difficult for students to understand and explore faith in the supernatural, which cannot be measured or proven by scientific means (Rafsanjani & Irama, 2022).

In the digital age, children and teenagers are often accustomed to visual and logical proof. They access information through the internet, which is full of pictures, videos and data that can be seen and felt directly. As a result, there is a tendency to doubt things that cannot be seen, such as the concept of iman bi al-ghaib. This view contradicts one of the most important aspects of Islam, where belief in the unseen requires deep trust without having to see physical evidence. This becomes one of the biggest challenges for Islamic Education especially teachers to explain and guide students to understand iman bi al-ghaib in the midst of a technological culture that prioritizes rationality and visualization (Rusli, 2023).

Advanced and interactive technologies tend to make students focus more on entertainment, quick information and social activities in cyberspace. This reduces the time usually used to reflect and strengthen the spiritual connection with Allah (Syahendra, 2024). In iman bi al-ghaib, there is an important element of introspection and contemplation of the unseen, which is difficult to achieve when students are more involved in the digital world full of distractions. This process of contemplation requires calmness and spiritual awareness, but technology often distracts people

from this process. In addition, the digital age opens up vast access to different views and interpretations of religion. The internet is full of content that sometimes contradicts Islamic teachings or even casts doubt on the concept of iman bi al-ghaib (Rafsanjani & Irama, 2022). Students who do not have a deep understanding of theology can be easily influenced by false or misleading information. For example, they may come across thoughts that question the existence of angels or the afterlife because there is no visual evidence that they can see. PAI teachers need to play an active role in providing a clear understanding of iman bi al-ghaib and equipping students with the ability to sort out correct information in accordance with Islamic teachings.

Iman bi al-ghaib also requires a strong belief in religious authority and sources of revelation such as the Qur'an and hadith, which are often overlooked in an era where everything can be questioned and debated freely on the internet. The skepticism instilled by digital culture can undermine students' belief in the supernatural. Therefore, Islamic education in the digital era requires an approach that is able to bridge faith bi al-ghaib with the modern rational world, so that students can still maintain their beliefs amidst the swift flow of digital information that sometimes contradicts religious teachings.

#### **4.2. Urgency of Integration of Theology and Science and Technology**

Learning Islamic education in the digital age and the integration between Islamic theology and science and technology are closely related in facing contemporary challenges. When the digital age and its technology offer a mass of information that can affect religious understanding, it is important for educators to be a bridge between spiritual values and advances in science and technology. The urgency of integration between Islamic theology and science and technology lies in their ability to complement each other, so that science and technology can develop with a solid ethical and moral foundation, while theology can be more relevant and applicable in addressing modern challenges. Therefore, the following are the main reasons underlying the urgency of this integration:

1. Forming a broad understanding of reality. Theology and science and technology offer different but complementary perspectives on reality. Theology provides spiritual and moral perspectives (Oktavia et al., 2023), while science and technology provide empirical knowledge and innovation (Kasmadi & Syukri, 2024). Integrating the two can result in a broader understanding of life and the universe.
2. Avoiding the dichotomy between religion and science and technology. The assumption that Islamic education and science and technology are dichotomized often creates tension and conflict (Syah, 2023). The integration of theology and science and technology can help overcome this dichotomy, by showing that the two do not have to contradict each other, but can go together.
3. Social Relevance. Theology integrated with science and technology can address important questions of modern society, such as environmental, health and social justice issues. By collaborating, theologians and scientists can offer solutions that are more complete and based on human values.
4. Creating benefits for humanity. One of the goals of this integration is to ensure that broadly speaking, advances in science and technology benefit humanity without losing sight of the spiritual, ethical and ultimate purpose of human life.

Through a harmonious approach between spiritual and rational values, this integration is expected to be able to utilize science and technology for the common good, while maintaining a balanced relationship with God, fellow humans, and the natural environment. In addition, the integration between Islamic theology and science and technology can also provide a deeper



perspective on the meaning of progress, by placing science and technology within the framework of a broader life goal, namely achieving happiness in the world and the hereafter (*al-falah*). Furthermore, the integration of Islamic theology and science and technology is not only relevant to answer the challenges of the times, but also a necessity for the development of an equitable and sustainable civilization. Therefore, the integration of Islamic theology and science and technology is very important to ensure that technological progress does not only pursue material or economic benefits, but also considers sustainability, justice, and the benefit of humanity holistically or as a whole.

#### 4.3. The Vision of the Golden Generation 2045 and its Role in Education

The golden generation can be defined as a group of individuals who live in an era with high personal qualities so that they become role models for the community in an effort to build the nation and state. After discussing education, it is also necessary to discuss the concept of Indonesia's golden generation. The period from 2012 to 2035 is considered an important phase to form Indonesia's golden generation, where the government and the entire community actively initiate and support various educational programs. This great expectation is supported by Indonesia's promising human resource potential (Aziz, et al., 2022).

From 2010 to 2035, Indonesia entered the demographic bonus phase, where the number of productive-age people is very high compared to the number of children and the elderly. This period is called demographic bonus based on the Central Statistics Agency (BPS) report in 2010, which shows that the number of young people is much greater than old people. Data shows that the group of children aged 0-9 years amounted to 45.93 million, while the age group of 10-19 years amounted to 43.55 million people. It is projected that in 2045, children aged 0-9 years in 2010 will be 35-45 years old, while the 10-20 age group will be in the range of 45-54 years.

This demographic bonus has the potential to have both positive and negative impacts. To minimize the negative impact, it is necessary to develop Indonesia's human resources optimally. One of the main steps that must be taken is to change the perspective towards this demographic bonus: not only as an opportunity, but also as a challenge that requires the readiness of the Indonesian people to manage it. According to Sugiharto in (Rizkasari, 2023) There are eight strategic steps to face the challenges of 2045 among these steps, the main highlight is "realizing basic education for all" because education is a key element in shaping a productive and advanced generation.

Education is a major factor in realizing Indonesia's golden generation in 2045. The golden generation needs access to quality education in order to build Indonesia into a superior, resilient and sovereign nation in the global arena. In addition to mastering science and technology, the golden generation must also be enriched with character education that is aligned with national identity and values. With a balance between competence in various disciplines and a strong character, the golden generation will be able to lead Indonesia to become an advanced, sovereign and superior country at the international level.

So the vision of the Golden Generation 2045 and its role in education shows the importance of understanding the concepts of "generation" and "gold" as fundamental elements in shaping the identity and characteristics of a society that will be a role model in the future. The Golden Generation, defined as a group of individuals with high quality, is expected to make a significant contribution to the progress of the Indonesian nation. In this context, the period from 2012 to 2035 is a crucial phase to instill the necessary educational values, considering that 2045 marks a century of Indonesian independence and has the potential to present a demographic bonus. With a high proportion of the productive-age population, the younger generation is expected to be the driving

force of the nation's development. However, to achieve this goal, the challenge of preparing quality human resources must be taken seriously. Quality education, which not only includes aspects of knowledge and technology, but also character education, is key in building a generation that is ready to face global challenges. By integrating academic competence and strong character, Indonesia's Golden Generation can contribute to a more superior and sovereign position in the international arena, in line with the strategic steps that must be taken to create a better future.

#### 4.4. Integration of Islamic Education towards the Golden Generation 2045

The integration of Islamic education in realizing the Golden Generation 2045 has a strategic role in building a superior and noble nation. Islamic education does not focus only on teaching religious values, but also encourages the development of character, intellect, and social skills in accordance with the demands of the times. Through a holistic approach, Islamic education integrates spiritual values with science and technology, providing a strong foundation for students to face increasingly complex global challenges. By strengthening the curriculum that balances religious and general knowledge, the younger generation is not only equipped with academic skills, but also solid moral ethics. This transformation is the main key in producing a generation with integrity, broad insight, and ready to contribute to the achievement of the 2045 Golden Indonesia vision.

To realize Indonesia's Golden Generation in 2045, future-focused educational development is needed. This effort aims to form a qualified, progressive, independent, and modern Indonesian society, while increasing the dignity of the nation. (Rohman et al, 2023). Success in education development will contribute significantly to the achievement of overall national development goals. In this context, educational development covers a wide range of dimensions, including social, cultural, economic and political aspects. Indonesia's aspiration in 2045 is to be a sovereign, developed, just and prosperous country.

Achieving development goals requires support from four main pillars: *First*, human resource development and mastery of science and technology; *second*, sustainable economic growth; *third*, equitable development; and *fourth*, national resilience and effective governance. In the context of sustainable development, Indonesia has committed to the Sustainable Development Goals (SDGs) document which emphasizes improving the quality of education globally.

One of the challenges hindering the progress of education globally is the lack of synchronization in the grand design of education. In this context, countries often develop education policies and curricula in isolation, without considering internationally adopted standards or approaches. As a result, there are disparities in the quality of education and access to adequate resources in different parts of the world. This lack of synchronization not only affects the development of individual competencies, but also hinders global collaboration in solving educational issues, such as inequalities in access, teaching quality and the relevance of curricula to society's needs. Therefore, a concerted effort is needed to develop a holistic and integrated grand design for education, so as to create harmony in the development of education at the global level.

Human resource development in Indonesia must be supported by effective population control policies, in order to maintain a balance between population growth and distribution. Education plays a crucial role in managing the demographic bonus, although the results of education investment can only be felt in the next 10 to 20 years. Therefore, Indonesians need to work together to create the Golden Generation of 2045, which coincides with the 100th anniversary of independence. Various problems can be overcome through collaboration, so efforts to improve the quality of Islamic education must be a joint commitment. The role of teachers is very important in this case, as agents of change who are able to produce religious, intelligent,

productive, reliable and comprehensive Indonesian individuals through optimal learning services, in order to realize the Golden Generation in 2045.

This makes (LPTK) Education and Education Personnel Institutions urgently need to prepare educators who are able to form the 2045 generation and implement professional educator management. In an effort to create the 2045 generation, the role of educators is crucial, because the future of the nation is in the hands of educators or teachers. Education plays a significant role in creating Indonesia's golden generation in 2045. The main components of education such as the government, teachers, and students must support each other, because they play a role in determining the right education model to realize the golden generation (Aziz et al, 2022). Education plays a crucial role in achieving Indonesia's Golden Generation in 2045. Components in the education system, such as teachers, government, and students, must support each other, because they have the greatest influence in determining the type of education that needs to be implemented in Indonesia to realize the golden generation.

In preparing for the Golden Generation of 2045, the government and education providers continue to prioritize the principle of *education for all* as a relevant focus and responsibility that must be resolved. This is not only related to education equity, but also to improving the quality of education. The government also has a great responsibility to improve the quality of education, including preparing and strengthening educators, curriculum, and supporting infrastructure. In addition, the 2045 national education roadmap is expected to be a guide in developing education that is in line with global developments. Realizing the Golden Generation 2045 requires collaboration between various parties, including educators, government, society, and all elements of the nation. With this collaboration, it is hoped that Islamic education will be able to produce a generation with integrity, intelligence, and broad insight, who are ready to compete in the era of globalization and contribute to achieving Indonesia's development goals as a sovereign, advanced, just and prosperous nation in 2045.

## 5. Conclusion

This conclusion has a crucial role for the integration of Islamic theology and science and technology (science and technology) in preparing Indonesia's Golden Generation 2045. This generation is defined as a group of individuals with high quality who will become future leaders in building the nation. In the context of a challenging digital era, Islamic Education has a great challenge in maintaining solid religious values while utilizing modern technology. The integration of theology and science and technology offers a holistic approach that not only prioritizes empirical knowledge, but also embeds moral values that are in accordance with Islamic teachings.

This research underscores the importance of ethical learning that emphasizes spiritual values and rationality as the basis for technological progress that not only brings material benefits, but also advances society holistically. Islamic education plays a role in developing young people who are not only intellectually intelligent, but also have strong character and integrity, in order to answer global challenges. This integration is seen as a necessity to build a just, sustainable and globally competitive society, thus achieving the vision of a Golden Indonesia 2045.

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