

THE ROLE OF ISLAMIC EDUCATIONAL TECHNOLOGY IN STIMULATING EARLY CHILDHOOD DEVELOPMENT

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Abstract: *Islamic Education Technology (TEI) emerged as a breakthrough to stimulate children's development with an approach that is in accordance with Islamic values. This study aims to analyze the role of Islamic Educational Technology (TEI) in stimulating early childhood development. The method used is a systematic literature review, data collected through an in-depth review of journal articles, books, and other relevant scientific publications, published between 2019 and 2024. Data analysis was carried out thematically. The results of the study show that TEI plays a significant role in stimulating: (1) improving cognitive understanding of basic Islamic concepts; (2) language development through video stories of the prophet that enrich vocabulary; (3) social-emotional development through educational games with cooperative values; and (4) spiritual-moral development through animation of moral formation. The implementation of TEI faces challenges in the form of limited quality content, excessive screen time, and the need for parental assistance. This study recommends the development of local culture-based TEI by involving religious experts and children's education.*

Keywords: *Islamic Educational Technology, Early Childhood Development, Digital Learning Media*

Introduction

Early childhood (0-6 years) is in the *golden age* (golden age) where brain development occurs very rapidly. The right stimulation at this time is crucial to optimize children's potential in various aspects of development, including cognitive, linguistic, social-emotional, physical-motor, and spiritual-moral (Hurlock, 2018; Susanto, 2021). The first six years of a child's life, often referred to as early childhood, are a period of very rapid and fundamental growth in all domains of development (Papalia & Feldman, 2011). In these critical times, neural connections are forming at an unparalleled rate, laying the foundation for future learning, behavior, and health. Simultaneously, we live in a digital age where technology penetrates every aspect of society, including children's lives. From interactive tablets to educational television, digital media is a ubiquitous presence. In the era of the digital revolution 4.0, technology has become an integral part of daily life, including in the world of early childhood education. A survey by the Indonesian Internet Service Providers Association (APJII, 2023) shows that 65.2% of internet users in Indonesia come from young people and parents with toddlers. This phenomenon presents challenges as well as opportunities for educators and parents in utilizing technology positively for educational purposes.

This confluence between critical development and pervasive technology presents unique challenges and opportunities for Islamic education. Traditional approaches often view technology with skepticism, focusing on its potential dangers, such as excessive screen time, inappropriate content exposure, and erosion of family interactions. While these concerns are valid, a completely prohibitive stance is increasingly impractical and fails to harness the potential of technology as a powerful educational tool.

Islamic Education Technology (TEI) emerged as an innovation that answers these challenges. TEI is defined as the integration of Islamic education principles with digital technology to create a fun and meaningful learning experience for children (Fauzi & Aeni, 2024). In contrast to general educational technology, TEI does not only focus on knowledge transfer but also on instilling moral and spiritual values.

Islamic education for early childhood has often been faced with conventional methods that tend to be monotonous, such as lectures and memorization, which are less attractive to children of the digital generation. This is where Islamic Educational Technology (TEI) offers a solution. TEI is defined as the use and management of technology, both hardware and software, to design, create, and use learning resources based on Islamic values (Nurdin & Usman, 2021).

Several previous studies have examined the use of technology in early childhood education, but it is still limited to the general scope and has not focused on Islamic approaches. This study seeks to specialize in the role of TEI in stimulating early childhood development in a more comprehensive and holistic manner. The focus of the research is to analyze how various forms of TEI such as learning applications about basic Islamic concepts, videos of prophetic stories, and interactive games about morals can be used to stimulate children's cognitive, linguistic, social-emotional, and spiritual-moral development. Therefore, this study aims to comprehensively analyze the role of TEI in stimulating holistic early childhood development.

Literature Review

Early Childhood Development is a multidimensional process that includes **Cognitive Development**: It deals with the ability to think, solve problems, and understand concepts. According to Piaget, early childhood is in the pre-operational stage (Santrock, 2019). **Language Development**: Includes the ability to listen, speak, and read and write initially. **Social-Emotional Development**: Includes the child's ability to recognize emotions, interact with others, and manage behavior (Masganti, 2017). **Spiritual-Moral Development**: A fundamental aspect in Islamic education that involves the cultivation of trust in Allah SWT, the introduction of the Pillars of Faith, and the habit of commendable behavior (akhlakul karimah) (Lickona, 2018).

TEI is a development of the concept of educational technology that is integrated with Islamic values. According to Rahman (2024), TEI is a systematic blend of technological tools, educational content, and Islamic values designed to achieve educational goals. The characteristics of TEI lie in: (1) content that is in accordance with the Islamic faith; (2) designs that do not display images of living beings in their entirety; (3) presenting the moral values of karimah; and (4) using Islamic audio such as recitation and nasyid.

In an Islamic perspective, early childhood development includes not only physical and cognitive aspects but also spiritual aspects. Emphasizing the importance of character formation from an early age through example and habituation in his Muqaddimah, he highlighted the importance of education that is appropriate to the stage of child development. TEI is not just a transfer of conventional media to digital. It is a deep integration between pedagogical principles, Islamic content, and user-friendly technology design for children. The basic principle is *tawhid*, which means that all science and technology are essentially sourced from Allah SWT (Al-Faruqi, 1995). Examples of TEI include: **Mobile Applications**: "Marbel Learns Hijaiyah", "Muslim

Kids TV". **Animated Video:** "The Story of the Prophet's Example", the series "Nusa Rara" episode with Islamic nuances. **Interactive Educational Games (*Serious Games*):** Games that teach ablution procedures or find halal and haram objects.

Research by Fitriani et al. (2023) shows that hijaiyah interactive applications can improve children's working memory and selective attention. According to Mayer's (2020) multimedia cognitive theory, the simultaneous presentation of information through text, images, and sound can improve conceptual understanding. The "Islamic Mathematics" application developed by Yusuf (2024) succeeded in improving children's numeracy skills through an Islamic contextual approach.

Research by Sari & Fauzi (2022) shows that the use of the "Marbel Learns Hijaiyah" application is effective in improving the ability to recognize Hijri letters in kindergarten group B children. Another study from Hasanah et al. (2023) found that animated videos of the story of the Prophet Ibrahim AS were able to instill the value of monotheism and example. This study intends to synthesize similar findings and build a more complete framework on the role of TEI in all developmental domains.

Saptaria's study (2024) proves that Islamic animation videos can enrich children's receptive and expressive vocabulary. Chomsky's theory of language acquisition (in Mar'at, 2023) supports the use of digital media that can activate LAD (Language Acquisition Device). The application of "Islamic Vocabulary" by Abdullah (2024) succeeded in improving early childhood metalinguistic skills.

Research by Damayanti (2024) shows that Islamic educational games can increase children's emotional intelligence. Based on Bowlby's attachment theory (in Santrock, 2022), TEI content that features affectionate relationships in the family can strengthen children's emotional security. The program "Qur'ani Emotions" by Khadijah (2024) has succeeded in helping children recognize and manage emotions.

Kurniawan's research (2024) proves that Islamic animation is effective in instilling moral values. Kohlberg's theory of moral development (in Lickona, 2023) modified with Islamic values can be the cornerstone of TEI content development. The application of "Akhlak Mulia" by the TEI Development Team (2024) has succeeded in forming positive habits in children.

A study by Pratiwi (2024) shows that parental assistance greatly determines the effectiveness of the use of TEI. The concept of "digital parenting" in an Islamic perspective developed by Alatas (2024) emphasizes the importance of content filters and time constraints. Teacher training in the use of TEI has also been proven to improve the quality of learning (Siregar, 2024).

Recent research in educational neuroscience suggests that proper digital stimulation can improve a child's brain neuroplasticity. A study by Muslim neuroscientist, Aziz (2024), found that TEI content designed with neuroscience principles can optimize the development of children's executive functions. The "Brainy Muslim Kids" application developed based on neuroscience findings has been proven to improve children's cognitive abilities by 40% compared to conventional methods.

The multiple intelligences approach developed by Gardner can be integrated in TEI. Firdaus' research (2024) developed a TEI platform that accommodates eight multiple intelligences with an Islamic approach. The platform has proven to be effective in identifying and developing the unique potential of each child through a variety of digital activities.

The design thinking method is starting to be widely applied in the development of TEI. According to Suryana (2024) research, the process of empathize, define, ideate, prototype, and test in design thinking can produce TEI products that are truly in accordance with children's

needs. TEI developer studio "Creative Muslim Edu" has succeeded in creating 10 highly engaging Islamic educational applications through this approach.

The development of inclusive TEI for children with special needs is starting to get attention. Halim's research (2024) developed the "Special Muslim Kids" application which is equipped with accessibility features for children with disabilities. This application has proven to be effective in helping autistic and deaf children learn to understand basic Islamic concepts.

The use of big data in TEI allows for personalization of learning. The "Smart Islamic Learning" platform developed by Tech Muslim Indonesia (2024) uses machine learning algorithms to analyze children's learning patterns and recommend appropriate content. The results showed a 35% increase in learning effectiveness compared to the one-size-fits-all approach.

The sustainability aspect of TEI development is an important concern. The Islamic fintech model has begun to be adopted to support the sustainability of TEI development. The "EduWaqf" platform developed by Baznas (2024) has succeeded in raising digital waqf funds for the development of TEI in remote areas, while creating a sustainable business model for TEI developers.

Cyber ethics education is an important component in the development of TEI. Safitri's research (2024) integrates the concept of digital media ethics from an Islamic perspective into TEI content. The "Digital Morals" module developed succeeded in increasing children's understanding of digital ethics by 65% based on the results of pre-test and post-test.

The evaluation system in TEI must be comprehensive and authentic. The "Authentic Islamic Assessment" assessment model developed by Hidayat (2024) includes cognitive, affective, and psychomotor aspects. Digital portfolio assessments have proven to be effective in documenting children's development (Wulandari, 2024). There are challenges in the development of TEI including: (1) digital divide; (2) limited resources; (3) resistance to change; and (4) data privacy and security issues. However, the opportunity for the development of TEI is very large in line with the increasing public awareness of the importance of Islamic education

Method

This study uses *the systematic literature review method* with a qualitative approach. The research procedure refers to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) model which includes four stages: identification, screening, feasibility, and inclusion (Moher et al., 2023).

The data collection technique was carried out by browsing online journal databases such as Google Scholar, ERIC, ScienceDirect, and Garuda Portal. The search keywords used were: "Islamic educational technology", "early childhood", "digital learning", "Islamic learning media", "early childhood development".

The data that has been collected is then analyzed using the thematic analysis technique of Miles & Huberman (2014), which includes data reduction, data presentation, and conclusion drawn. The data were grouped into major themes according to the focus of the study, namely the role of TEI in stimulating cognitive, linguistic, social-emotional, and spiritual-moral aspects.

Results and Discussion

The role of TEI in cognitive development has been shown to be effective in stimulating children's cognitive development. TEI presents abstract concepts in Islam to be more concrete and visual. For example, an interactive app that teaches the sequence of prayer movements with animations and sounds, helps children understand the sequence and meaning behind each movement. The puzzle game in the application "Marbel Learns Hijaiyah" trains children's visual

memory and problem-solving skills. This is in line with Piaget's cognitive theory which states that early childhood learns best through direct experience and concrete objects (Santrock, 2019). TEI transforms abstract concepts into an interactive and fun learning experience. Through the application "Learning Hijaiyah with Ali" developed by Fitriani et al. (2023), it showed a 45% increase in the ability to recognize hijaiyah letters in children aged 4-5 years. The app uses a multisensory approach with a combination of audio, visual, and kinesthetic that matches the characteristics of early childhood learning. The educational game "The Adventure of the Muslim Little One" researched by Wahyudi (2024) is able to practice problem-solving skills through challenges that require simple logic. These results are in line with Piaget's cognitive theory which states that early childhood learns through direct interaction with its environment (Santrock, 2022).

Many TEI content is designed to enrich children's vocabulary, both in Indonesian and Arabic. Videos of children's Islamic songs such as "Applause of Allah the Most Great" or "Hijaiyah Song" from the YouTube channel "Salman Al-Farisi" indirectly train listening and expand children's vocabulary. Applications that display prophetic stories with narration and text can also stimulate interest in early reading (*emerging literacy*). Research by Nisa et al. (2023) proves that animated video media is effective in improving abilities through the animated video "The Exemplary Story of the Prophet" produced by the Muslim Animation Studio (2023) proven to enrich Arabic and Indonesian vocabulary in children. Saptaria's (2024) study of 50 kindergarten children showed a 60% increase in new vocabulary mastery after watching the video regularly for one month. The "Islamic Storytelling" application developed by the University of Education Indonesia (2024) is able to improve children's storytelling skills through voice recording and story visualization features. These findings support Vygotsky's theory of the importance of media as an intermediary in language development (Berk, 2023).

TEI content often inserts social-emotional values through stories and simulations. An animated video about "Giving Alms" can teach empathy and generosity. An interactive game where the main character has to help his friends who are struggling can train a social and cooperative spirit. By looking at conflicts and resolutions in Islamic animated stories, children learn to recognize and manage their emotions, such as anger, sadness, and joy, in a way that is in accordance with Islamic teachings. The role of TEI in social-emotional development through the interactive game "Akhlaq Mulia" designed by the TEI Development Team (2024) succeeded in teaching the values of cooperation and empathy through simulation of social situations. A study of 30 PAUD children showed a 55% increase in prosocial behavior after using the game for three weeks. The animated video "Managing Emotions with Muslim Families" produced by Islamic EduTV (2024) helps children recognize and express emotions appropriately. These results are relevant to the theory of emotional development that emphasizes the importance of learning through modeling (Masganti, 2023).

The role of TEI in spiritual-moral development This is the central role of TEI. The introduction of Prayer, Pillars of Faith, Pillars of Islam, and Asmaul Husna becomes more interesting through interactive audio-visuals. The exemplary stories of the prophets and companions presented in the form of animated films leave a deeper impression than just being told orally. through the "Learn to Pray" application version 2.0 developed by the TEI Development Center (2024) has proven to be effective in building prayer habits in children. An evaluation of 40 children aged 5-6 years showed that 70% were able to practice prayer movements correctly after using the app for one month. The animation "Akhlaqul Karimah" series researched by Kurniawan (2024) has succeeded in instilling the value of honesty and responsibility through relatable characters for children. These findings support Lickona's (2023) theory of moral development about the importance of example in character formation.

Despite its many benefits, the implementation of TEI faces several challenges: *Limited Quality Content*: Few developers understand the principles of Islamic education and child development *Excessive Screen Time*: The risk of uncontrolled use can interfere with eye health and social development *Assistance Needs*: The active role of parents and teachers in the learning process is required.

Conclusion

Based on the results of the analysis, it can be concluded that Islamic Educational Technology (TEI) plays a strategic and multifunctional role in stimulating early childhood development holistically. TEI is able to stimulate cognitive, linguistic, social-emotional, and spiritual-moral aspects through innovative, interactive, and appropriate presentations of Generation Z children. In the future, it is necessary to develop a more creative and research-based TEI, as well as socialization to educators and parents on how to use it appropriately, so that the final goal of intelligent and noble early childhood education can be achieved.

To optimize the use of TEI, it is recommended:

1. *For Developers*: Create content that is based on local culture by engaging religious and child education experts
2. *For Parents*: Provide active assistance and limit screen time as recommended by experts
3. *For Educators*: Integrate TEI in learning with a balanced approach between digital and conventional.

Further research is recommended to develop a comprehensive TEI evaluation model and examine the long-term impact of TEI use on child development.

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