The Utilization of Information and Communication Technology in 21st Century Islamic Religious Education Learning

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Abstract: *The utilization of Information and Communication Technology (ICT) has significantly transformed 21st-century education, particularly in Islamic Religious Education (PAI) at SMP Al Azhar 1 Bandar Lampung. This study aims to analyze the role of ICT in improving the effectiveness of PAI learning and its impact on enhancing students' critical thinking and problem-solving skills. Through qualitative methods, data were collected from teachers and students using observations, interviews, and document analysis. The results show that ICT integration, including e-learning platforms, interactive videos, and Learning Management Systems (LMS), has significantly increased student engagement and developed their critical thinking skills. ICT also improves students' ability to solve complex problems within the context of religious education by offering visual and interactive learning tools. Furthermore, ICT fosters more effective independent learning by allowing students to better understand abstract religious concepts through technology-enhanced learning resources. This study highlights the crucial role of ICT in equipping students with essential skills for the 21st century, demonstrating that its utilization in Islamic education not only enhances content mastery but also prepares students for future challenges in the digital era.*

Abstrak: Pemanfaatan Teknologi Informasi dan Komunikasi (TIK) telah secara signifikan mengubah pendidikan abad ke-21, khususnya dalam Pendidikan Agama Islam (PAI) di SMP Al Azhar 1 Bandar Lampung. Penelitian ini bertujuan untuk menganalisis peran TIK dalam meningkatkan efektivitas pembelajaran PAI serta dampaknya terhadap peningkatan keterampilan berpikir kritis dan pemecahan masalah siswa. Melalui metode kualitatif, data dikumpulkan dari guru dan siswa menggunakan observasi, wawancara, dan analisis dokumen. Hasil penelitian menunjukkan bahwa integrasi TIK, termasuk platform e-learning, video interaktif, dan Sistem Manajemen Pembelajaran (LMS), secara signifikan meningkatkan keterlibatan siswa dan mengembangkan keterampilan berpikir kritis mereka. TIK juga meningkatkan kemampuan siswa dalam memecahkan masalah kompleks dalam konteks pendidikan agama dengan menyediakan alat pembelajaran visual dan interaktif. Selain itu, TIK mendorong pembelajaran mandiri yang lebih efektif dengan memungkinkan siswa memahami konsep-konsep agama yang abstrak melalui sumber daya pembelajaran yang didukung teknologi. Penelitian ini menyoroti peran penting TIK dalam membekali siswa dengan keterampilan esensial untuk abad ke-21, menunjukkan bahwa penggunaannya dalam pendidikan agama tidak hanya meningkatkan penguasaan materi, tetapi juga mempersiapkan siswa menghadapi tantangan di era digital.

INTRODUCTION

Human life is greatly influenced by the development of science and technology. The rapid advancement of information technology in the current era

of globalization is inevitable, particularly in the field of education [1]. Technology has become a key driver of transformation in various aspects of life, including how people learn and teach [2]. In the context of education, the use of Information and Communication Technology (ICT) has become an indispensable necessity, especially in the digital era that demands significant changes in teaching methods.

The critical role of ICT in education, especially in Islamic Religious Education (PAI), lies not only in delivering content more efficiently but also in fostering higher-order thinking skills (HOTS), such as critical thinking, problem-solving, and digital literacy [3]. In a modern educational landscape where technology is integrated into nearly every aspect of life, students need to develop skills beyond memorization, allowing them to apply religious principles in real-world contexts through the use of digital tools.

Information technology has advanced rapidly since the introduction of physical media, such as teaching aids, audiovisual tools, filmstrips, and videotapes. Along with these developments, media technology has evolved into more interactive forms, including interactive videos, teleconferencing, satellites, and the widespread use of the internet in various types of learning [4]. This technology has provided easier and faster access to information, making education

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[1] Mutia Ade Syafitri et al., "Peranan Teknologi Informasi dalam Pendidikan IPS untuk Anak Sekolah Dasar", *Jurnal Pendidikan Tambusai*, Vol. 6 No. 6 (2022), h. 4411–14, tersedia pada https://jptam.org/index.php/jptam/article/view/3551 (2022).

[2] Idarwana Hasin dan M. Khalid M Nasir, "The effectiveness of the use of Information and Communication Technology (ICT) in rural secondary schools in Malaysia", *Journal of Education and e-Learning Research*, Vol. 8 No. 1 (2021), h. 59–64, https://doi.org/10.20448/JOURNAL.509.2021.81.59.64; Christopher Alan Bonfield et al., "Transformation or evolution?: Education 4.0, teaching and learning in the digital age", *Higher Education Pedagogies*, Vol. 5 No. 1 (Januari 2020), h. 223–46, https://doi.org/10.1080/23752696.2020.1816847.

[3] Olaf Zawacki-Richter et al., "Systematic review of research on artificial intelligence applications in higher education – where are the educators?", *International Journal of Educational Technology in Higher Education*, Vol. 16 No. 1 (Desember 2020), h. 39, https://doi.org/10.1186/s41239-019-0171-0.

[4] Ugochukwu Matthew et al., "Contemporary Development in E-Learning Education, Cloud Computing Technology & Internet of Things", *EAI Endorsed Transactions on Cloud Systems*, Vol. 7 No. 20 (2018), h. 169173, https://doi.org/10.4108/eai.31-3-2021.169173; M Mubasher Hassan dan Tabasum Mirza, "Information and Communication Technology (ICT) in The Distance Education System: An Overview", *IOSR Journal of Research & Method in Education (IOSR-JRME)*, Vol. 10 No. 6 (2020), h. 38–42, https://doi.org/10.9790/7388-1006053842.

more inclusive and dynamic. Lintang and Mattew affirm that the global changes brought about by technological advancements have had a significant impact on various aspects of human life, including the field of education [5].

In Islamic Religious Education, the integration of ICT addresses the challenges of traditional education that may not fully engage students in critical analysis and practical application of religious teachings. Research by Peace found that technology enables a shift from teacher-centered to student-centered learning, facilitating independent exploration and deep engagement with religious concepts [6]. ICT is instrumental in helping students better understand abstract religious concepts through visual and interactive resources.

The development of science and technology has driven efforts to innovate teaching methods. In education, technology has become an essential tool to facilitate more effective and efficient learning [7]. Saputra defines Information and Communication Technology as any form of technology used to process, distribute, and manage information [8]. This technology encompasses hardware, such as computers and software, as well as internet networks that enable rapid and widespread communication and information transfer [9]. In the context of education, ICT plays a crucial role in supporting more modern and interactive learning.

Furthermore, the flexibility offered by ICT in PAI is essential in accommodating the diverse learning needs of students. The use of e-learning platforms and Learning Management Systems (LMS) provides students with

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[5] Chika Lintang dan Lukman Yudho Prakoso, "Perang dan Ekonomi: Sejarah Keterkaitan antara Konflik Militer dan Perubahan Ekonomi Global", *Jurnal Kewarganegaraan*, Vol. 7 No. 1 (2023), h. 372–78,; Ugochukwu Matthew et al., *Loc.Cit.*

[6] Tuyizere Alice Peace, "Aligning religious education learning environment and pedagogies to 21st century educational changes in higher educational institutions in Uganda", *Journal of Emerging Trends in Educational Research and Policy Studies*, Vol. 12 No. 2 (2021), h. 39–54,.

[7] Koderi, "Pengembangan Modul Elektronik Berbasis SAVI Untuk Pembelajaran Bahasa Arab", *Jurnal Teknologi Pendidikan*, Vol. 19 No. 3 (2017), h. 206,.

[8] Andi Muh Akbar Saputra et al., *TEKNOLOGI INFORMASI: Peranan TI dalam berbagai bidang*, (PT. Sonpedia Publishing Indonesia, 2023).

[9] Shalini Sharma Goel et al., "A review of Internet of Things: qualifying technologies and boundless horizon", *Journal of Reliable Intelligent Environments*, Vol. 7 No. 1 (2021), h. 23–33, https://doi.org/10.1007/s40860-020-00127-w.

access to a wide range of resources anytime and anywhere [10]. This flexibility is especially relevant in modern education, where students are expected to navigate both religious and secular knowledge in increasingly complex environments.

The influence of ICT on the 21st-century education system is significant. Sundari states that modern education cannot be separated from ICT, as this technology has become an essential element in improving the quality of learning [11]. Technology allows the teaching and learning process to become more flexible, interactive, and adaptable to the needs of students [12]. Learning is no longer confined to physical classrooms; it can now take place anytime and anywhere through digital platforms.

However, it is important to acknowledge the challenges and limitations associated with the use of ICT in education, especially in religious education. A significant issue is the digital divide, which creates unequal access to technology, particularly in rural or underserved regions [13]. Additionally, there is concern that over-reliance on technology may diminish the social and moral interactions that are fundamental to religious education [14]. Therefore, a balanced approach that combines technology with traditional pedagogical methods is necessary to preserve the spiritual and ethical aspects of PAI.

According to Peace, education in the 21st century must adapt to technological advancements that require individuals to possess the ability to learn and innovate [15]. 21st-century skills include technology, media, and information literacy, as well as life skills needed to face global challenges. Today's learning

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[10] Tsaaniyatush Shoolihah Fauzan dan Aida Hayani, "Mobile Learning Berbasis Android Sebagai Media Pembelajaran PAI di MAN 2 Yogyakarta", *Jurnal Wisdom: Kajian Multidisipliner*, Vol. 1 No. 1 (2024), h. 1–8,.

[11] Elgy Sundari, "Transformasi Pembelajaran Di Era Digital: Mengintegrasikan Teknologi Dalam Pendidikan Modern", *Cendekia Pendidikan*, Vol. 4 No. 4 (2024), h. 50–54,.

[12] Olaf Zawacki-Richter et al., *Loc.Cit.*

[13] Adem Yılmaz, "The Effect of Technology Integration in Education on Prospective Teachers' Critical and Creative Thinking, Multidimensional 21st Century Skills and Academic Achievements", *Participatory Educational Research*, Vol. 8 No. 2 (2021), h. 163–99, https://doi.org/10.17275/per.21.35.8.2.

[14] Chris Evans dan Wenqian Robertson, "The four phases of the digital natives debate", *Human Behavior and Emerging Technologies*, Vol. 2 No. 3 (Juli 2020), h. 269–77, https://doi.org/10.1002/hbe2.196.

[15] Tuyizere Alice Peace, *Loc.Cit.*

must be able to integrate knowledge, skills, and attitudes in line with technological advancements [16]. Activity-based learning models supported by technology can help students develop these skills optimally. Technology-based education fosters the development of higher-order thinking skills (HOTS) [17]. The use of ICT in education can help students develop these skills through more practical and project-based approaches, where students are encouraged to use technology to solve problems.

In the context of Islamic Religious Education (PAI), the use of ICT is crucial for improving the effectiveness and efficiency of learning. By utilizing technology, teachers can deliver PAI material in a more engaging and interactive manner. Technology also enables students to grasp abstract religious concepts more easily. The use of videos, animations, and simulations can help clarify complex material that is difficult to understand through traditional methods [18].

The COVID-19 pandemic in 2020 to 2021 accelerated the use of ICT in education. The shift from face-to-face learning to distance learning, which relied heavily on technology, highlighted the importance of ICT in maintaining the continuity of education [19]. The online learning policy implemented by the Ministry of Education and Culture has transformed the educational landscape in Indonesia, where technology plays a crucial role in connecting teachers and students.

[16] Iim Halimatul Mu'minah, "Studi Literatur: Pembelajaran Abad-21 Melalui Pendekatan Steam (Science, Technology, Engineering, Art, and Mathematics) dalam Menyongsong Era Society 5.0", *Prosiding Seminar Nasional Pendidikan*, Vol. 3 (2021), h. 584–94,.

[17] I Made Wena, "Pembelajaran Berorientasi Hots (Higher Order Thinking Skill) Di Era Revolusi Industri 4.0 Untuk Mewujudkan Generasi Indonesia Emas 2045", *Pembelajaran Berorientasi Hots (Higher Order Thinking Skill) Di Era Revolusi Industri 4.0 Untuk Mewujudkan Generasi Indonesia Emas 2045*, 2020, h. 15–25, tersedia pada https://e-journal.unmas.ac.id/index.php/Prosemnaspmatematika/article/view/892/800 (2020).

[18] Koderi et al., "Developing Lampung Local Wisdom Film of Arabic Communication Skills for Madrasah Tsanawiyah Students", *International Journal of Information and Education Technology*, Vol. 13 No. 12 (2023), h. 2004–13, https://doi.org/10.18178/ijiet.2023.13.12.2015; I Gusti Ayu et al., "Development of Gender-Based Digital Modules As A Supplement to Learning Indonesian Language Level in Denpasar", Vol. 16 (2024), h. 2939–52, https://doi.org/10.35445/alishlah.v16i3.5086.

[19] Samuel Kai Wah Chu et al., *21st Century Skills Development Through Inquiry-Based Learning*, (Singapore: Springer Singapore, 2017), https://doi.org/10.1007/978-981-10-2481-8; Muhammad Sukron Djazilan dan Mila Hariani, "Implementation of E-Learning-Based Islamic Religious Education", *Technology and Society*, Vol. 1 No. 2 (2022), h. 14–21,.

The use of technology in online learning presents its own challenges, such as limited internet access and the availability of devices in certain regions [20]. However, Information and Communication Technology (ICT) remains the most effective solution in sustaining education during times of crisis. Even after the pandemic, online learning and the use of technology have continued to evolve, becoming integral to a more flexible education system.

The Islamic Education curriculum has emphasized the importance of utilizing technology in the learning process. Technology is not only used to deliver content but also to foster students' creativity and skills. Through technology, students are able to explore new ideas and apply them in creative projects [21]. The use of technology in Islamic Religious Education allows students to engage in deeper learning that is more relevant to their daily lives.

The use of ICT also provides students with the opportunity to develop digital literacy skills, critical thinking abilities, and communication skills that are essential in the era of globalization [22]. By integrating ICT into Islamic Religious Education (PAI), students not only learn about religious teachings but are also better prepared to face the challenges of a digitally interconnected world. The presence of technology has also transformed the role of teachers. They are no longer solely the primary source of information but now act as facilitators, helping students to use technology for independent learning. Teachers must possess adequate technological literacy to effectively utilize various learning platforms

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[20] Adrie A Koehler et al., "Examining students' use of online case-based discussions to support problem solving: Considering individual and collaborative experiences", *Computers & Education*, Vol. 179 (2022), h. 104407, https://doi.org/https://doi.org/10.1016/j.compedu.2021.104407; Ria Anilawati, "Analisis Interaksi Sosial dalam Pembelajaran Pendidikan Agama Islam di Era Digital", *GUAU: Jurnal Pendidikan Profesi Guru Agama Islam*, Vol. 3 No. 7 (2023), h. 216–28, tersedia pada http://studentjournal.iaincurup.ac.id/index.php/guau (2023).

[21] Hasanbasri Hasanbasri et al., "Sumber Daya Teknologi Terhadap Pelaksanaan Kurikulum di Era Digital", *AL-MIKRAJ Jurnal Studi Islam dan Humaniora (E-ISSN 2745-4584)*, Vol. 4 No. 1 (2023), h. 874–88, https://doi.org/10.37680/almikraj.v4i1.4181; Idarwana Hasin dan M. Khalid M Nasir, *Loc.Cit.*

[22] Ong Kiat Xin dan Dalbir Singh, "Development of Learning Analytics Dashboard based on Moodle Learning Management System", *International Journal of Advanced Computer Science and Applications*, Vol. 12 No. 7 (2021), h. 838–43, https://doi.org/10.14569/IJACSA.2021.0120793; Tsaaniyatush Shoolihah Fauzan dan Aida Hayani, *Loc.Cit.*

and applications. Therefore, improving teacher competencies in technology use has become crucial.

The aim of this research is to analyze how the use of Information and Communication Technology can enhance the effectiveness of Islamic Religious Education in the 21st century and to identify its impact on students' competency development in facing global challenges. This study also seeks to explore strategies that teachers can apply to leverage technology in enriching students' learning experiences and deepening their understanding of religious concepts.

METHOD

This study employed a qualitative approach using descriptive-analytical methods [23], The study aimed to describe the utilization of Information and Communication Technology (ICT) in Islamic Religious Education (PAI) learning at Al Azhar 1 Junior High School Bandar Lampung. This approach was chosen as it provides an in-depth and systematic overview of the use of ICT in learning and its impact on the development of student competencies in the context of 21st-century education. The research involved purposive sampling, selecting participants based on their active engagement with ICT in the learning process. Specifically, PAI teachers who regularly use ICT in their teaching and students who have demonstrated significant interaction with technology in the classroom were chosen. The sample consisted of five PAI teachers and 30 students from different grade levels, which provided a balanced representation of experiences. The research subjects were PAI teachers and students who actively used ICT in the learning process, along with relevant documentation.

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[23] Quin J. Morrow dan Jenifer K. McGuire, "A Qualitative Inquiry of Associations Between Family Environment and Suicidality for Transgender Youth Experiencing Homelessness", *Journal of Adolescent Research*, April 2023, h. 074355842311631, https://doi.org/10.1177/07435584231163191; Md. Kausar Alam, "A systematic qualitative case study: questions, data collection, NVivo analysis and saturation", *Qualitative Research in Organizations and Management: An International Journal*, Vol. 16 No. 1 (Agustus 2020), h. 1–31, https://doi.org/10.1108/QROM-09-2019-1825.

Data collection in this study was conducted through observation, in-depth interviews, and document analysis [24]. Observation was used to directly observe the implementation of Information and Communication Technology (ICT) in Islamic Religious Education (PAI) learning in the classroom. In-depth interviews were conducted with PAI teachers and students to gain insights into their experiences with ICT usage, while document analysis involved reviewing school documents related to policies and the implementation of technology-based learning. Ethical considerations were observed throughout the data collection process, including obtaining informed consent from all participants. Teachers and students were informed about the purpose of the study, and their anonymity was ensured by assigning codes instead of names in all data handling and reporting. Permission was also obtained from the school administration to access relevant documents and conduct interviews during school hours. Data from these three methods were analyzed to identify patterns and themes related to ICT utilization at Al Azhar 1 Junior High School Bandar Lampung.

The data sources for this research included PAI teachers, students of Al Azhar 1 Junior High School Bandar Lampung, and school documents. PAI teachers served as the primary source, providing insights into how ICT is integrated into daily learning activities. Students offered perspectives on their learning experiences using technology, while school documents supported the analysis of policies related to technology-based learning.

The data obtained were analyzed using thematic analysis methods [25]. Thematic analysis was conducted in a step-by-step manner. Initially, the data were transcribed and familiarized by repeated reading. Open coding was applied to identify relevant units of meaning within the transcripts. These codes were then grouped into broader categories, and patterns were identified. The analysis process emphasized both inductive and deductive approaches to capture the

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[24] J.W. Creswell, *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. Thousand Oaks, California*, (USA: SAGE Publications, Inc., 2014).

[25] Michelle E Kiger dan Lara Varpio, "Thematic analysis of qualitative data: AMEE Guide No. 131", *Medical Teacher*, Vol. 42 No. 8 (Agustus 2020), h. 846–54, https://doi.org/10.1080/0142159X.2020.1755030.

complexity of ICT usage in PAI. The analysis process involved coding the collected data based on relevant themes, such as the effectiveness of ICT usage, challenges in technology implementation, and its impact on students' competencies. After the coding process, the researchers identified key themes that emerged from the data, followed by an in-depth analysis to compile the research findings. These findings are expected to provide a comprehensive overview of how ICT is utilized in Islamic Religious Education at Al Azhar 1 Junior High School Bandar Lampung, as well as how this technology supports the development of 21st-century skills in students.

RESULT AND DISCUCCIONS

Result

The Role of Information and Communication Technology in 21st-Century Learning

Information and Communication Technology (ICT) has played a highly significant role in transforming the 21st-century learning process. At Al Azhar 1 Junior High School Bandar Lampung, this study found that the implementation of ICT has reshaped the dynamics of Islamic Religious Education (PAI). PAI teachers actively use various technological media such as e-learning, interactive learning videos, and cloud-based learning management systems, enabling the learning process to become more effective, interactive, and engaging. This is supported by research from Haukas et al. and Kim et al., which found that the implementation of ICT in education significantly increases students' learning motivation and engagement [26]. Research conducted by Hasanbasri and Criollo also shows that ICT expands students' access to diverse learning resources,

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[26] Åsta Haukås et al., "Investigating the effectiveness of an online language teacher education programme informed by self-determination theory", *The Language Learning Journal ISSN:*, 2023, https://doi.org/10.1080/09571736.2022.2027001; Deoksoon Kim dan Mimi Li, "Digital storytelling: facilitating learning and identity development", *Journal of Computers in Education*, Vol. 8 No. 1 (2021), h. 33–61, https://doi.org/10.1007/s40692-020-00170-9.

unrestricted by time and space [27]. Further research by Latorre reveals that the use of ICT in learning helps accelerate the mastery of complex concepts, particularly through visualization and simulation [28]. In addition, Dewi & Muhid found that the use of e-learning and cyber teaching supports stronger collaborative learning and encourages the development of critical thinking skills [29]. Additionally, other studies have shown that LMS-based technology can enhance students' learning autonomy, allowing them to learn independently and more effectively [30].

In the context of Al Azhar 1 Junior High School Bandar Lampung, cyber teaching has been widely adopted. Teachers use a Learning Management System (LMS) that allows students to access learning materials anytime and anywhere. Students indicated that LMS helps them study religious topics at their own pace and revisit lessons as needed. This reflects what Hasin & M. Nasir stated, that technology enables teachers to create a more effective learning environment and supports professional collaboration [31]. Based on the research findings, students demonstrated higher levels of engagement and better critical thinking skills when using ICT-based media compared to conventional teaching methods. Teachers also observed that students engage more deeply with the material when they can visualize abstract religious concepts through video simulations and animations. They found it easier to understand abstract religious concepts through visual and

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[27] Hasanbasri Hasanbasri et al., *Loc.Cit.*; Santiago Criollo-C et al., "Mobile Learning Technologies for Education: Benefits and Pending Issues", *Applied Sciences*, 2021, https://doi.org/10.3390/app11094111.

[28] Cecilia Latorre-Cosculluela et al., "ICT efficacy and response to different needs in university classrooms: effects on attitudes and active behaviour towards technology", *Journal of Computing in Higher Education*, Vol. 36 No. 2 (2024), h. 350–67, https://doi.org/10.1007/s12528-023-09357-2.

[29] Puspita Dewi dan Abdul Muhid, "Students' Attitudes towards Collaborative Learning through E-Learning During Covid-19: A Male and Female Students", *English Teaching Journal : A Journal of English Literature, Language and Education*, 2021, tersedia pada https://api.semanticscholar.org/CorpusID:238770582 (2021).

[30] Parimala Veluvali dan Jayesh Surisetti, "Learning Management System for Greater Learner Engagement in Higher Education—A Review", *Higher Education for the Future*, Vol. 9 No. 1 (Oktober 2021), h. 107–21, https://doi.org/10.1177/23476311211049855; Samar Mohammed Alharbi et al., "The Effect Of E-Collaborative Learning Environment On Development Of Critical Thinking And Higher Order Thinking Skills", *Journal of Positive School Psychology*, Vol. 2022 No. 6 (2022), h. 6848–54, tersedia pada http://journalppw.com (2022).

[31] Idarwana Hasin dan M. Khalid M Nasir, *Loc.Cit.*

audiovisual media, such as videos simulating religious practices and animations of Islamic stories.

In line with this, ICT has a significant impact on the education system. This research shows that technology has transformed learning methods to become more student-centered, in alignment with the demands of 21st-century skills [32]. At Al Azhar 1 Junior High School Bandar Lampung, skills such as critical thinking, creativity, and problem-solving are further developed through the use of ICT. For example, students are given project-based assignments that utilize online information searches and collaboration through online discussion platforms, enabling them to explore religious topics both independently and collaboratively. Some students reported that collaborating with classmates on projects through online platforms makes learning more enjoyable and allows them to learn from their peers.

Integration of Technology and Media in 21st-Century Learning

Al Azhar 1 Junior High School Bandar Lampung has successfully integrated information technology and media into Islamic Religious Education (PAI) learning, which has positively impacted the quality of education. Based on observations and interviews, the use of visual and audiovisual media in PAI lessons has greatly helped in clarifying complex religious concepts. Teachers noted that using visual media such as PowerPoint and videos makes it easier for students to grasp the core of the lesson, especially for complex topics. Teachers use interactive PowerPoint presentations and educational videos to capture students' attention and make learning more engaging. Additionally, the use of Computer Assisted Instruction (CAI) has encouraged students to learn independently through interactive modules specifically designed for individual learning. This aligns with Yılmaz's research, which shows that the integration of

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[32] *Ibid.*; Kuruva Syamala Devi dan Vijaya Lakshmi, "Moodle -An Effective Learning Management System for 21 st Century Learners ISSN NO : 2231-3990 Moodle – An Effective Learning Management System for 21 st Century Learners Page No : 4474", *Alochana Chakra Journal*, Vol. IX No. June (2020), h. 4474–85,.

interactive technology enhances students' learning autonomy and facilitates the understanding of abstract material [33].

The research by Maemunah et al. also supports these findings, showing that the use of audiovisual media has been proven to enhance student engagement in learning, especially for topics that are difficult to understand using conventional methods [34]. In addition, Fauzan & Hayani mention that the integration of ICT in religious education allows for greater flexibility and broader dissemination of information to students, which is highly relevant at Al Azhar 1 Junior High School Bandar Lampung [35]. At this school, students have access to various digital religious resources, which enrich their knowledge and strengthen their technological competencies. This is in line with Koderi's findings, which noted that access to digital resources in religious education contributes to the development of students' technological skills [36]. Other research by Mu'minah also emphasizes the importance of ICT in promoting the development of 21st-century skills, including digital literacy, which is crucial for students' futures. [37].

Thus, the integration of technology in PAI at Al Azhar 1 Junior High School Bandar Lampung not only aids in mastering religious content but also contributes to the development of essential digital skills for the 21st century. This reinforces the research of Hasan Basri and Anilawati, who stated that students' mastery of technology can accelerate their adaptation to future technological changes and expand their ability to access various learning resources effectively. [38].

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[33] Adem Yılmaz, *Loc.Cit.*

[34] Neneng Maemunah et al., "The Use of Audio Visual Media In Improving The Quality Of PAI Learning In SMA Negeri City Of Bandung", *Journal of Social Science*, Vol. 2 No. 4 (2021), h. 416–28, https://doi.org/10.46799/jss.v2i4.181.

[35] Tsaaniyatush Shoolihah Fauzan dan Aida Hayani, *Loc.Cit.*

[36] Koderi, *Loc.Cit.*

[37] Iim Halimatul Mu'minah, *Loc.Cit.*

[38] Ria Anilawati, *Loc.Cit.*; Hasanbasri Hasanbasri et al., *Loc.Cit.*

Utilization of Technology and Information Media in 21st-Century Islamic Religious Education Learning

The use of e-learning-based information technology and digital learning media has become a key factor in the success of Al Azhar 1 Junior High School Bandar Lampung in enhancing the effectiveness of PAI learning. In line with Robinson Situmorang's view, the use of computers as a learning medium enables the integration of audio, visual, and animation functions, supporting various student learning styles. Some students mentioned that learning through mobile applications gives them greater control over their learning time and location, allowing access to learning materials outside formal school hours. This provides greater flexibility and autonomy for students in managing their learning time and location.

Research by Nur et al. also reveals that information technology benefits both teachers and students by enabling collaboration without the constraints of time and space, while maximizing students' potential to learn from various sources effectively [39]. Furthermore, Yılmaz states that e-learning allows students to develop independent learning skills through project-based learning conducted online [40], Meanwhile, Koderi et al., Sukron Djazilan & Hariani, and Wahyuni & Bhattacharya found that mobile learning increases students' motivation by providing more flexible access to learning materials [41].

This supports Qureshi's findings, which mention that these technologies create a collaborative learning environment that fosters active interaction between students and teachers [42]. Thus, the utilization of technology at Al Azhar 1 Junior High School Bandar Lampung not only enhances the effectiveness of learning but

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[39] Elgy Sundari, *Loc.Cit.*; Dahniar Nur et al., "Dampak Sosiologi Digital Terhadap Perubahan Sosial Budaya Pada Masyarakat Masa Depan", *Jurnal Pendidikan Dan Ilmu Sosial*, Vol. 2 No. 2 (2024), h. 123–35,.

[40] Adem Yılmaz, *Loc.Cit.*

[41] Sri Wahyuni dan Sanchita Bhattacharya, "Strategy of Islamic Religious Education Teachers in Increasing Student Learning Motivation", *Tafkir: Interdisciplinary Journal of Islamic Education*, Vol. 2 No. 2 (2021), h. 229–49, https://doi.org/10.31538/tijie.v2i2.22; Muhammad Sukron Djazilan dan Mila Hariani, *Loc.Cit.*; Koderi et al., *Loc.Cit.*

[42] Muhammad Asif Qureshi et al., "Factors affecting students' learning performance through collaborative learning and engagement", *Interactive Learning Environments*, Vol. 31 No. 4 (Mei 2023), h. 2371–91, https://doi.org/10.1080/10494820.2021.1884886.

also promotes better collaboration and the development of students' digital skills, which are relevant to future needs.

Discussion

This research confirms that Information and Communication Technology (ICT) plays a crucial role in transforming the learning paradigm in the 21st century, particularly in the context of Islamic Religious Education (PAI) at Al Azhar 1 Junior High School Bandar Lampung. The active implementation of ICT at this school has significantly enhanced the effectiveness and efficiency of the learning process, demonstrating the positive impact of ICT in education [43]. Teachers regularly utilize e-learning platforms, interactive learning videos, and cloud-based learning management systems to create a more flexible and integrated learning environment. This finding is supported by Syukron Koderi and Wahyuni, who state that the application of ICT in religious education not only enhances students' motivation to learn but also improves overall student engagement, particularly in terms of active participation during the learning process [44].

The primary advantage of ICT implementation at Al Azhar 1 Junior High School lies in the improved accessibility and flexibility for students in accessing learning materials. E-learning technology and Learning Management Systems (LMS) enable students to engage in independent learning anytime and anywhere, without the constraints of space and time [45]. This aligns with findings that show ICT provides students with access to a wider variety of learning resources, extending beyond what is taught in the classroom [46]. The use of interactive

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[43] Cecilia Latorre-Cosculluela et al., *Loc.Cit.*; Idarwana Hasin dan M. Khalid M Nasir, *Loc.Cit.*

[44] Sri Wahyuni dan Sanchita Bhattacharya, *Loc.Cit.*; Muhammad Sukron Djazilan dan Mila Hariani, *Loc.Cit.*; Koderi et al., *Loc.Cit.*

[45] Koderi et al., *Loc.Cit.*; Umi Hijriyah et al., "Pengembangan Media Pembelajaran Bahasa Arab Berbasis Android Untuk Mahãrat Al Istimã' Kelas 8 Smp", *Al Mi'yar: Jurnal Ilmiah Pembelajaran Bahasa Arab dan Kebahasaaraban*, Vol. 5 No. 2 (2022), h. 239, https://doi.org/10.35931/am.v5i2.1352; Irfan Yusuf et al., "Development of Moodle Learning Management System-Based E-Learning Media in Physics Learning", in *Proceedings of the Tarumanagara International Conference on the Applications of Social Sciences and Humanities (TICASH 2019)*, (Paris, France: Atlantis Press, 2020), https://doi.org/10.2991/assehr.k.200515.042; Ong Kiat Xin dan Dalbir Singh, *Loc.Cit.*

[46] Kuruva Syamala Devi dan Vijaya Lakshmi, *Loc.Cit.*; Ong Kiat Xin dan Dalbir Singh, *Loc.Cit.*

learning videos has also helped students grasp difficult religious concepts through visualization and simulation, accelerating their mastery of the material [47].

In addition, the implementation of cyber teaching at this school enables teachers to create a more effective and collaborative learning environment. By utilizing the Learning Management System (LMS), teachers can monitor student progress, provide real-time feedback, and facilitate student collaboration through online discussions or project-based group assignments [48]. These benefits are consistent with previous research findings, which have shown that the use of e-learning and cyber teaching supports stronger collaborative learning and promotes the development of critical thinking skills [49]. Through the use of online discussion platforms and project-based assignments, students are able to explore religious topics more deeply in a collaborative manner [50]. The results of the study at Al Azhar 1 Junior High School indicate that students who utilized ICT-based media demonstrated higher engagement and better critical thinking skills compared to those in conventional learning methods.

The integration of ICT in Islamic Religious Education (PAI) provides students with 21st-century skills, particularly in terms of digital literacy and technological proficiency. By granting access to various digital religious resources, students at Al Azhar 1 Junior High School not only enrich their knowledge but also sharpen essential digital skills, preparing them for future challenges. The research by Anilawati and Hasanbasri et al. confirms that access to digital resources in religious education contributes to the development of students' technological skills, which is highly relevant to these findings [51]. At this

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[47] W Daher dan H Sleem, "Middle School Students' Learning of Social Studies in the Video and 360-Degree Videos Contexts", *IEEE Access*, Vol. 9 (2021), h. 78774–83, https://doi.org/10.1109/ACCESS.2021.3083924; Muhammad Hanif, "The development and effectiveness of motion graphic animation videos to improve primary school students' sciences learning outcomes", *International Journal of Instruction*, Vol. 13 No. 4 (2020), h. 247–66, https://doi.org/10.29333/iji.2020.13416a; Koderi et al., *Loc.Cit.*

[48] Parimala Veluvali dan Jayesh Surisetti, *Loc.Cit.*

[49] Samar Mohammed Alharbi et al., *Loc.Cit.*; Puspita Dewi dan Abdul Muhid, *Loc.Cit.*

[50] Adrie A Koehler et al., *Loc.Cit.*; Gary Pan et al., "An exploration into key roles in making project-based learning happen", *Journal of International Education in Business*, Vol. 14 No. 1 (Januari 2021), h. 109–29, https://doi.org/10.1108/JIEB-02-2020-0018.

[51] Ria Anilawati, *Loc.Cit.*; Hasanbasri Hasanbasri et al., *Loc.Cit.*

school, students are trained to use technology as a learning aid, ranging from searching for information on the internet to using interactive learning software.

Furthermore, the integration of technology in Islamic Religious Education (PAI) has had a positive impact on enhancing students' learning autonomy. The use of interactive modules based on Computer Assisted Instruction (CAI) at Al Azhar 1 Junior High School enables students to learn independently and regulate their own learning pace. TIK mendorong pengembangan keterampilan belajar mandiri yang sangat penting di abad ke-21 [52]. In addition, the use of technology such as mobile learning has provided greater flexibility for students to access materials outside formal class hours, increasing learning motivation through more flexible and structured access to learning content [53].

At Al Azhar 1 Junior High School, another benefit is the use of chat groups, web blogs, and online discussions, which facilitate communication between teachers and students outside of school hours. These technologies support active interaction between teachers and students, even after school, creating a more collaborative learning environment and promoting continuous learning [54]. This is in line with the fact that such technology fosters active interactions that enrich the learning experience and enhance students' understanding of the material being taught [55].

From these findings, it can be concluded that the integration of ICT in PAI learning at Al Azhar 1 Junior High School Bandar Lampung not only facilitates

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[52] Samuel Kai Wah Chu et al., *Loc.Cit.*

[53] Riana Nurmalasari dan Hakkun Elmunsyah, "Peran Aplikasi Elemen Mesin sebagai Mobile Learning Interaktif untuk Optimasi Pembelajaran Digital pada Pendidikan Vokasi", *Didaktika: Jurnal Kependidikan*, Vol. 13 No. 2 (2024), h. 1583–94, tersedia pada https://jurnaldidaktika.org/contents/article/view/703 (2024); Tsaaniyatush Shoolihah Fauzan dan Aida Hayani, *Loc.Cit.*

[54] Laxmi Prasad Ojha dan Resham Acharya, "The Potential of Blogs as Discussion Forums for Developing Collaborative Writing Skills in Higher Education", in *Innovative Technologies and Pedagogical Shifts in Nepalese Higher Education*, (BRILL, 2020), h. 86–103, https://doi.org/10.1163/9789004448865_006; Miguel Ángel Herrera-Pavo, "Collaborative learning for virtual higher education", *Learning, Culture and Social Interaction*, Vol. 28 (2021), h. 100437, https://doi.org/https://doi.org/10.1016/j.lcsi.2020.100437.

[55] Maryam Nur Annisa et al., "Tekhnologi Media Pembelajaran Berbasis Video Animasi Untuk Meningkatkan Kemampuan Berbicara Bahasa Arab Siswa di Madrasah Ibtidaiyah Negeri 2 Kabupaten Gorontalo", *Jurnal Sustainable*, Vol. 6 No. 2 (2023), h. 378–88,.

mastery of religious content but also plays a crucial role in the development of digital skills and 21st-century thinking skills. These findings reinforce Haleem's statement, which emphasizes that mastering technology will help students adapt more quickly to future technological changes and expand their ability to access various learning resources effectively [56]. Thus, this research makes a significant contribution to the existing literature, demonstrating that the integration of technology in religious education can transform students' learning approaches and enhance the overall effectiveness of education.

Despite the positive findings, it is essential to recognize the challenges associated with integrating ICT, particularly in regions with limited technological resources. For schools in rural or underserved areas, access to high-speed internet, updated devices, and teacher training in digital pedagogy remain significant obstacles [57]. Additionally, over-reliance on ICT could potentially diminish essential teacher-student interactions and reduce opportunities for fostering personal values and ethics in religious education [58]. A balanced approach, combining ICT with traditional teaching methods, is recommended to maintain the integrity of the learning experience while leveraging the benefits of digital tools.

Another benefit that emerged from this study is ICT's ability to transform teacher-centered learning into a more student-centered approach. With technology, students become more active in the learning process and gain greater control over what and how they learn [59]. Teachers shift from being information transmitters to facilitators, supporting students' development through technology

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[56] Abid Haleem et al., "Understanding the role of digital technologies in education: A review", *Sustainable Operations and Computers*, Vol. 3 (2022), h. 275–85, https://doi.org/10.1016/j.susoc.2022.05.004.

[57] Adem Yılmaz, *Loc.Cit.*

[58] Olori Abiola Lateef, "Influence of Digital Divide and Experience on Nigerian University Students' Attitude Towards the Use of Information Communication Technologies for Learning", *Journal of Education in Black Sea Region*, Vol. 5 No. 2 (2020), h. 96–102, https://doi.org/10.31578/jebs.v5i2.202.

[59] Christina Wekerle et al., "Using digital technology to promote higher education learning: The importance of different learning activities and their relations to learning outcomes", *Journal of Research on Technology in Education*, Vol. 54 No. 1 (Januari 2022), h. 1–17, https://doi.org/10.1080/15391523.2020.1799455.

that enables personalization and adaptation to each student's learning style. These findings are in line with what Muhammad Aufa Muis mentioned, that the implementation of ICT enables more personalized and relevant learning experiences tailored to the individual needs of students, especially in fields that require a conceptual approach, such as Islamic Religious Education [60].

Overall, this study provides a significant contribution by revealing the benefits of ICT implementation in Islamic Religious Education (PAI) at Al Azhar 1 Junior High School Bandar Lampung. The integration of ICT not only enhances the quality of learning but also better prepares students to face 21st-century challenges, including digital literacy, independent learning, and critical and collaborative thinking skills. This research strengthens the existing literature while providing empirical evidence of the effectiveness of technology in religious education in the digital era.

CONCLUSION

The findings of this study underscore the significant contributions of Information and Communication Technology (ICT) to the field of Islamic Religious Education (PAI), specifically at Al Azhar 1 Junior High School Bandar Lampung. By integrating ICT tools such as e-learning platforms, interactive learning videos, and Learning Management Systems (LMS), the learning process has become more interactive, flexible, and aligned with 21st-century educational needs. This study highlights how the use of ICT not only enhances students' motivation and engagement but also fosters critical and independent thinking skills, essential for modern learning environments. Additionally, the integration of ICT in PAI supports students' mastery of religious content while simultaneously developing their digital literacy competencies, preparing them to meet future global challenges.

This research contributes to the broader understanding of how ICT can transform Islamic education, emphasizing that technology, when effectively

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[60] Muhammad Aufa Muis et al., "Menggali Potensi Teknologi Dalam Pendidikan Agama Islam: Solusi Untuk Generasi Milenial", *Jurnal Riset Islam*, Vol. 7 (2024), h. 21–38,.

utilized, can make religious studies more relevant and accessible in today's digital landscape. To further advance the integration of ICT in Islamic education, this study recommends practical measures for improvement. First, schools should strengthen ICT infrastructure and provide ongoing training programs for teachers, enabling them to effectively integrate technology into their teaching practices. Teacher training could focus on developing digital pedagogy skills and incorporating ICT tools within the PAI curriculum, fostering a more consistent and impactful application of technology across learning activities. Furthermore, curriculum adjustments that incorporate project-based learning involving ICT can further develop students' critical thinking, collaboration, and problem-solving skills.

Lastly, partnerships with educational institutions and technology providers should be pursued to share best practices and explore the adoption of emerging technologies such as artificial intelligence (AI) and augmented reality (AR), enhancing the learning experiences of students in religious education. These steps can support a more robust integration of ICT, better preparing students with essential skills for the digital age and reinforcing the role of ICT in modern Islamic education.

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