



Digitalizing Local Wisdom: Innovation in Islamic Learning for Generation Z in Aceh

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Abstract

This study examines the implementation of an Android-based Islamic learning media grounded in Acehese local wisdom among Generation Z students at State Islamic Higher Education Institutions (PTKI) in Aceh Province. Responding to the digital-native characteristics of Generation Z and drawing on constructivist learning theory and culturally responsive pedagogy, the research employs a qualitative case study design involving lecturers, Generation Z students, educational technologists, cultural leaders, and educational technology practitioners. Data were collected through in-depth semi-structured interviews, participant observation, and document analysis, and analyzed using thematic analysis. The findings reveal that integrating local wisdom values such as the philosophy of “Adat bak Poe Teumeureuhom, Hukom bak Syiah Kuala,” the Peusijek tradition, and Kenduri Blang into interactive multimedia significantly enhances student engagement and contextual understanding of Islamic teachings. Among the application features, gamification elements (points, badges, and challenges) and social learning tools (discussion forums and peer feedback) demonstrated the highest impact on motivation and active participation, while content personalization strengthened individual learning pathways. The study contributes theoretically by proposing a culturally integrated digital learning model that bridges Islamic education innovation with local wisdom preservation. However, challenges remain in infrastructure readiness, human resource competence in application development, and ensuring the authenticity of digitally represented cultural content. Overall, this implementation supports effective Islamic education innovation while fostering a technologically adaptive generation rooted in Islamic values and Acehese cultural heritage.

Keywords: Educational technology, local wisdom of Aceh, Generation Z, Islamic education innovation, Android application.

Abstrak

Penelitian ini mengkaji implementasi media pembelajaran Islam berbasis Android yang berlandaskan kearifan lokal Aceh di kalangan mahasiswa Generasi Z di Perguruan Tinggi Agama Islam Negeri (PTKI) Provinsi Aceh. Menanggapi karakteristik digital-native Generasi Z dan mengacu pada teori pembelajaran konstruktivis serta pedagogi responsif budaya, penelitian ini menggunakan desain studi kasus kualitatif yang melibatkan dosen, mahasiswa Generasi Z, ahli teknologi pendidikan, tokoh budaya, dan praktisi teknologi pendidikan. Data dikumpulkan melalui wawancara semi-terstruktur mendalam, observasi partisipan, dan analisis dokumen, dan dianalisis menggunakan analisis tematik. Temuan menunjukkan bahwa pengintegrasian nilai-nilai kearifan lokal seperti filosofi “Adat bak Poe Teumeureuhom, Hukum bak Syiah Kuala,” tradisi Pensijuek, dan Kenduri Blang ke dalam multimedia interaktif secara signifikan meningkatkan keterlibatan mahasiswa dan pemahaman kontekstual ajaran Islam. Di antara fitur aplikasi, elemen gamifikasi (poin, lencana, dan tantangan) dan alat pembelajaran sosial (forum diskusi dan umpan balik antar teman sebaya) menunjukkan dampak tertinggi pada motivasi dan partisipasi aktif, sementara personalisasi konten memperkuat jalur pembelajaran individu. Studi ini memberikan kontribusi teoritis dengan mengusulkan model pembelajaran digital terintegrasi budaya yang menjembatani inovasi pendidikan Islam dengan pelestarian kearifan lokal. Namun, tantangan tetap ada dalam kesiapan infrastruktur, kompetensi sumber daya manusia dalam pengembangan aplikasi, dan memastikan keaslian konten budaya yang direpresentasikan secara digital. Secara keseluruhan, implementasi ini mendukung inovasi pendidikan Islam yang efektif sekaligus membina generasi yang adaptif secara teknologi dan berakar pada nilai-nilai Islam serta warisan budaya Aceh.

Kata kunci: Teknologi pendidikan, kearifan lokal Aceh, Generasi Z, inovasi pendidikan Islam, aplikasi Android.

Introduction

The era of digitalization has fundamentally changed the paradigm of education, especially in the context of Islamic learning aimed at generation Z¹. The transformation of digital technology in the world of education creates an urgent need to integrate *Digital Learning Tools* with contextual and relevant Islamic values². Generation Z, who were born between 1997-2012, have the

¹ Dahliana Dahliana and Almuahjir Almuahjir, “Adaptive Islamic Student Management for Generation Z: Integrating Modern Educational Theories and Islamic Values,” *JURNAL HURRIAH: Jurnal Evaluasi Pendidikan Dan Penelitian* 6, no. 2 (2025): 1032–39.

² M Mashudi and C Hilman, “Digital-Based Islamic Religious Education: A New Orientation in Enhancing Student Engagement and Spiritual Understanding. *Global*, 2 (10), 2488-2501,” 2024; Mochammad Syafiuddin Shobirin and Nur Efendi, “Integrating Islamic Values Into Digital Character Education: Managing Curriculum Innovation In The Era Of

unique characteristics of being *Digital Natives* who grew up in a technological environment and have interactive, visual, and multimedia-based learning preferences ³. This phenomenon demands innovation in Islamic learning methods that are able to accommodate the learning characteristics of generation Z while maintaining the substance of authentic Islamic values.

Recent studies on digital natives indicate that Generation Z tends to exhibit shorter sustained attention spans in linear learning environments, yet demonstrates high adaptability in multitasking across digital platforms ⁴. Traditional teacher-centered and monotonous instructional approaches are increasingly ineffective for Generation Z learners, who prefer interactive, visually rich, and participatory learning environments ⁵. This creates a gap between the learning methods applied and the students' learning preferences, which ultimately results in low *Commitment* and learning effectiveness ⁶. This condition requires a transformation of the learning paradigm that not only utilizes digital technology, but also integrates content that is relevant to the local cultural context ⁷.

Over the last five years, high-impact international studies have emphasized the importance of culturally responsive digital pedagogy in engaging digital-native learners ⁸. Research in mobile learning environments demonstrates that algorithm-driven personalization, gamification mechanics, and social interaction features significantly increase student engagement and knowledge retention ⁹. However, most Islamic learning applications available on mainstream platforms prioritize doctrinal content delivery and usability design without integrating localized cultural

Education 5.0," *International Journal of Education Management and Religion* 2, no. 2 (2025): 141–61.

³ Andrias Pujiono, "Pemanfaatan Media Sosial Sebagai Media Pembelajaran Bagi Generasi - Z," *Tanzhimuna* 2, no. 2 (2023): 190–203, <https://doi.org/10.54213/tanzhimuna.v2i02.180>.

⁴ Hala Shaker Hammad, "Teaching the Digital Natives: Examining the Learning Needs and Preferences of Gen Z Learners in Higher Education," *Transcultural Journal of Humanities and Social Sciences* 6, no. 2 (2025): 214–42.

⁵ Coimbatore Kahe, "Education at Crossroads: A Paradigm Shift and Emerging Methodologies in Teaching-Learning," *Emerging Methodologies In Teaching And Learning: A Contemporary Overview*, 2025, 37–45.

⁶ Wafi Ali Hajjaj, "Transformation Of Islamic Education Management In The Digital Era : Trends And Implications For Learning Quality," 2024, 2–7.

⁷ Momčilo Bajac and Mirjana Fišer, "Digital Transformation and New Educational Paradigm," *Social Informatics Journal* 3, no. 1 (2024): 1–8.

⁸ Sabrina Belloula, "Empowering Educators: Leveraging AI to Revolutionize Lesson Planning," *International Journal of Research in Education and Science* 11, no. 2 (2025): 264–80.

⁹ Benjamin Asubam Weyori et al., "Gamification Applications Trends: A Comprehensive and Systematic Mapping Study," *Journal of Harbin Engineering University* 45, no. 11 (2024).

epistemologies into their instructional algorithms¹⁰. This indicates a conceptual gap between digital delivery systems and culturally embedded Islamic educational values.

The integration of local wisdom in Islamic learning is a strategic solution to create *meaningful learning experience* that are contextual and meaningful. Local wisdom refers to cultural values, norms, and practices that have been internalized within communities and remain relevant to Islamic teachings¹¹. In the context of Aceh, local wisdom has its own uniqueness because it has undergone a process *Indigenization Islam* that produces traditions such as Peusijek, Kenduri Blang, and the customary system *Customary principles such as "Adat bak Poe Teumeureuhom, Hukum bak Syiah Kuala* who have deep Islamic values¹². The integration of Aceh's local wisdom in digital learning media can provide a context closer to student life, so that learning becomes more relevant and meaningful¹³.

Embedding Acehnese local wisdom into digital learning algorithms is crucial because adaptive systems rely on contextual triggers to enhance cognitive relevance and emotional resonance¹⁴. Studies in culturally adaptive learning systems show that culturally aligned content increases learner motivation, identity affirmation, and moral internalization¹⁵. In this context, local wisdom does not merely function as supplementary cultural decoration, but as a core epistemological framework guiding scenario-based learning, decision-making simulations, and value-based gamification structures¹⁶.

The development of Android applications as an Islamic learning

¹⁰ Mo'tasim Mo'tasim et al., "Integrating Islamic Epistemology, Cultural Context, and Deep Learning for Multicultural Islamic Education: A Thematic Literature Review," *FIKROTUNA: Jurnal Pendidikan Dan Manajemen Islam* 14, no. 2 (2025): 316–35; Ivan Nurseha, "The Integration of Deep Learning and Holistic Approaches in Moderate Islamic Religious Education amidst Digital Era," *JEIM: Journal of Education and Islamic Moderation* 1, no. 01 (2025): 50–62.

¹¹ Ahmad Muflihini, "Integrasi Kearifan Lokal Dan Literasi Digital Dalam Pendidikan Islam Untuk Menghadapi Tantangan Abad 21," *Al-Fikri: Jurnal Studi Dan Penelitian Pendidikan Islam* 7, no. 1 (2024): 56–67.

¹² Airi Safrijal, Alvi Syahrin, and Yanis Rinaldi, "Settlement of Meugoe Blang Disputes Through Customary Law of Aceh," *Journal of Law and Sustainable Development* 11, no. 5 (2023): e525–e525.

¹³ Efi Mulyati, Rahmi Novalita, and Rambang Muharramsyah, "Implementation of Aceh Local Wisdom-Based Education Program at MTsN 5 Pidie, Pidie Regency," *Sumatra Journal of Disaster, Geography and Geography Education* 9, no. 2 (2025): 99–107.

¹⁴ Feri Sulianta, *Local Wisdom in the Digital Landscape* (Feri Sulianta, 2024).

¹⁵ Yuheng Zeng et al., "Examining the Impact of Culturally Responsive Teaching and Identity Affirmation on Student Outcomes: A Mixed-Methods Study in Diverse Educational Settings," *International Journal of Educational Development* 117 (2025): 103376.

¹⁶ Pooja Tomar, "Bridging Ancient Wisdom and Modern Practice: Applying Subhāṣitāni for Ethical Decision-Making in Action Learning Frameworks," *Action Learning: Research and Practice*, 2025, 1–16.

medium based on local wisdom has great potential to overcome the learning challenges of generation Z¹⁷. Android platforms were chosen because of the high market penetration in Indonesia, ease of access, and flexibility in integrating various interactive multimedia features¹⁸. Android-based learning applications can accommodate the learning preferences of Generation Z through features such as *interactive multimedia*, *social learning*, *personalized content*, and *gamification elements*¹⁹. In addition, the application can provide *offline access* that allows learning to be carried out anytime and anywhere, according to the flexible *learning characteristics* desired by Generation Z²⁰.

Islamic Religious Universities (PTKI) in Aceh Province have a strategic position in the implementation of Islamic learning media based on local wisdom. As a higher education institution that has an *institutional commitment* to the development of Islamic science, PTKI has the responsibility to produce graduates who not only have academic competence but also a deep understanding of Islamic values and local wisdom. The geographical and historical context of Aceh as the "*Porch of Mecca*" provides a comparative advantage in developing an Islamic learning model that integrates the universal values of Islam with local Acehese wisdom. The implementation of digital learning media at PTKI in Aceh Province can be a *pilot project* that can be adapted by other Islamic educational institutions in Indonesia.

The challenges in the implementation of Islamic learning media based on local wisdom through Android applications include technical aspects, content, and *User Acceptance*²¹. From the technical aspect, adequate technological infrastructure and competent human resources are needed in application development. From the content aspect, systematic content

¹⁷ Mohamad Maulidin Alif Utama, "Integrating Thematic Tafsir of Qur'an Surah Al-'Alaq with Local Wisdom-Based Learning Media: An Islamic Education Model for Generation Z in West Sumatra," *Jurnal Ilmiah Al-Mu'ashirah: Media Kajian Al-Qur'an Dan Al-Hadits Multi Perspektif* 22, no. 2 (2025): 222–39.

¹⁸ Nisa Humairah, Zainuddin Muchtar, and Marham Sitorus, "The Development of Android-Based Interactive Multimedia for High School Students," in *The 5th Annual International Seminar on Transformative Education and Educational Leadership (AISTEEL 2020)* (Atlantis Press, 2020), 113–19.

¹⁹ Umi Basyiroh et al., "Systematic Review: Android-Based Interactive Learning Media to Enhance Understanding of Islamic Education in Support of SDGs," *Profetika: Jurnal Studi Islam* 25, no. 02 (2024): 533–46.

²⁰ Ali Alruthaya, Thanh-Thuy Nguyen, and Sachithra Lokuge, "The Application of Digital Technology and the Learning Characteristics of Generation Z in Higher Education," *ArXiv Preprint ArXiv:2111.05991*, 2021.

²¹ Khalilullah Amin Ahmad et al., "Mobile Learning of Islamic Studies: A Comprehensive Review," *Journal of Advanced Research in Applied Sciences and Engineering Technology* 48, no. 2 (2025): 211–24.

validation is required which involves cultural experts and scholars to ensure the authenticity of integrated local wisdom²². While from the aspect of *User Acceptance*, the right approach is needed to ensure that applications can be accepted and used optimally by students and lecturers²³. These challenges require a holistic approach that involves a multiple stakeholders in the Islamic education ecosystem in Aceh.

This research is important to be carried out because there have not been many studies that specifically examine the implementation of Islamic learning media based on local wisdom through Android applications, especially in the context of Generation Z in PTKI. Previous studies such as focused on the development of Islamic learning applications but did not integrate local cultural values²⁴. Meanwhile, Mustapa explored the use of local wisdom in Islamic education but limited it to conventional classroom methods without utilizing digital platforms²⁵. Another study examined mobile learning for Islamic studies but emphasized general usability rather than contextualizing content with local traditions²⁶.

Although previous studies have examined Islamic mobile learning, culturally responsive pedagogy, and local wisdom separately, a significant gap remains in integrating local wisdom values algorithmically into digital Islamic learning systems. Most existing Islamic applications function primarily as content repositories and rarely contextualize Islamic teachings within specific socio-cultural frameworks such as Acehese adat. Furthermore, they do not systematically incorporate local philosophical constructs, such as "*Adat bak Poe Teumeureuhom, Hukom bak Syiah Kuala*," into adaptive learning, gamification, or social interaction features. Therefore, this study positions itself at the intersection of digital pedagogy, Islamic education innovation, and culturally embedded learning.

²² Rasidi Rasidi and Galih Istiningsih, "Education Based on Local Wisdom: An Alternative Model for the Integration of Cultural Values in the School Curriculum in Indonesia," *BIS Education* 1 (2025): V125027–V125027.

²³ Rahmadhani, *Prosiding Seminar Nasional Pendidikan FKIP Univeritas Mahaputra Muhamad Yamin. Solok 5 Mei 2018*, vol. 53, 2013.

²⁴ Ossman Nordin, Nik Md Saiful Azizi Nik Abdullah, and Mohamad Ridhuan Abdullah, "Harmonizing Lifelong Learning with Islamic Values: A Framework for Personal and Societal Development," *BITARA International Journal of Civilizational Studies and Human Sciences (e-ISSN: 2600-9080)* 7, no. 2 (2024): 247–65.

²⁵ Kasmudin Mustapa et al., "Technology-Enhanced Education: Nurturing the Digital Generation-Experiences in Islamic Schools in Indonesia," *International Journal of Teaching and Learning* 1, no. 1 (2023): 16–40.

²⁶ Ibrahim Umar and Siddik Faruk Tilli, "The Use of Mobile Apps for Islamic Learning: A Study on Accessibility and Learning Outcomes," *Journal of Computers for Science and Mathematics Learning* 2, no. 1 (2025): 6–17.

This study aims to examine the effectiveness of Android-based Islamic learning media grounded in local wisdom in enhancing engagement and understanding among Generation Z students at PTKI in Aceh. In addition, it analyzes implementation challenges, formulates an integrative model of Acehese local wisdom in digital learning applications, and explores its implications for Islamic education in the digital era.

Theoretically, this research contributes to the development of Islamic educational technology, particularly in integrating local wisdom into digital learning. Practically, it provides a reference for PTKI and other Islamic institutions in developing innovative and relevant learning media, while also supporting the preservation of Acehese local wisdom through digital transformation.

Method

This study employs a qualitative approach with a case study design to examine the implementation of Android-based Islamic learning media grounded in local wisdom among Generation Z in PTKI across Aceh Province. The research was conducted over six months in selected institutions, including UIN Ar-Raniry Banda Aceh and IAIN Lhokseumawe, chosen for their strong integration of Islamic education and local wisdom. Informants were selected through purposive sampling and included five groups: Islamic education lecturers, Generation Z students, educational technology experts, cultural leaders, and digital learning practitioners. Data were collected through semi-structured interviews, participant observation, and document analysis to capture in-depth insights into implementation practices.

Data analysis was conducted using thematic analysis, involving stages of familiarization, coding, theme development, and synthesis into a coherent narrative. Research validity was ensured through triangulation, detailed documentation, and member checking, while ethical considerations included informed consent, anonymity, and participants' right to withdraw. The study also maintained sensitivity to local cultural and religious norms while aiming to contribute to the advancement of Islamic education in Aceh.

Findings and Discussion

Effectiveness Of The Implementation Of Android Learning Media Based On Local Wisdom

1. Generation Z Student Engagement Level

The implementation of Islamic learning media based on local wisdom through the Android application shows a significant increase in the

engagement rate of generation Z students at PTKI throughout Aceh Province. The interview findings revealed that students showed high enthusiasm for digital learning that integrates local culture. As expressed by informant Siti Aisyah (21 years old):

"Wow, that's a really good idea! So far, we have been studying Islam in general. If there is an application that specifically discusses Islam in the context of Acehese culture, it will be easier to understand and more meaningful for us who are Acehese."

These findings are in line with research which shows that the integration of technology in PAI learning is able to answer the challenges of the digital era and meet the needs of generation Z, thus potentially creating more dynamic, interactive, and student-centered learning.²⁷ The use of Learning Management System (LMS) platforms, quiz-based applications such as Quizizz and Kahoot, and social media integration have a significant impact on increasing student engagement.

The preference of Generation Z students for multimedia learning over conventional methods can be clearly seen from the statement of Muhammad Rizki (20 years old):

"I like applications that are user-friendly, not complicated, and have interactive features. For example, there are quizzes, videos, audio, and interesting images. If it's just a text, you're bored."

This reinforces the argument that Generation Z has unique characteristics as digital natives who need interactive and visual learning. Research supports these findings by showing that students' knowledge of the History of Islamic Civilization increases significantly with the implementation of gamified learning with video media compared to conventional learning²⁸. This indicates that the use of technology in Islamic learning not only increases engagement but also learning effectiveness.

These findings can be theoretically situated within the framework of Constructivism, which posits that learners actively construct knowledge through meaningful interaction with their environment and prior experiences²⁹. In this context, the integration of Acehese local wisdom into

²⁷ Dedi Supriadi, Taufiqurrahman, and Samsuddin, "INOVASI PEMBELAJARAN PAI DI ERA DIGITAL : STRATEGI MENUMBUHKAN MINAT BELAJAR GEN-Z" 4 (2025): 319–34.

²⁸ Rabiatul Adawiyah, Lukmanul Hakim, and Asep Abdurrohman, "Implementasi Pembelajaran Gamifikasi Disertai Video Untuk Meningkatkan Pengetahuan Sejarah Peradaban Islam Siswa" 4, no. 2 (2024): 133–45.

²⁹ Maimoona H Al Abri, Asma Y Al Aamri, and Abdelrahman Mohamed Ahmed Elhaj, "Enhancing Student Learning Experiences through Integrated Constructivist Pedagogical Models," *European Journal of Contemporary Education and E-Learning* 2, no. 1 (2024): 130–49.

Islamic learning applications allows students to build understanding not merely from abstract doctrinal explanations, but from culturally embedded realities that are already familiar to them ³⁰. Contextual learning rooted in cultural experience strengthens cognitive connections and enhances intrinsic motivation, particularly among Generation Z learners who value relevance and authenticity in educational content ³¹.

Moreover, from the perspective of Connectivism, learning in the digital era occurs through networks of information, technology, and social interaction ³². The use of Android-based applications, Learning Management Systems, gamified platforms such as Quizizz and Kahoot, and social media integration reflects a networked learning ecology in which knowledge is distributed across digital nodes rather than centralized in a single instructor. Generation Z students, as digital natives, are accustomed to navigating multiple information streams simultaneously, engaging in collaborative knowledge construction, and accessing learning resources beyond classroom boundaries ³³. Therefore, the increased engagement observed in this study is not merely a technological effect, but a manifestation of network-based learning patterns consistent with Connectivist principles.

Recent empirical studies further support this theoretical alignment. Research indicates that culturally responsive digital learning environments significantly enhance student engagement and motivation by bridging academic content with learners' sociocultural identities ³⁴. Additionally, gamified and multimedia-based Islamic education has been shown to improve participation, retention, and conceptual understanding compared to traditional lecture-based approaches ³⁵. Thus, the effectiveness of the Android learning media in this study can be understood not only as an instructional innovation but as a pedagogical transformation grounded in contemporary

³⁰ M Arif Idris and Suroto Suroto, "Optimizing Character Education through Local Wisdom in Aceh: Approaches, Obstacles, and Solutions," *Didaktika Religia* 11, no. 1 (2023): 51–72.

³¹ Ramli Ramli et al., "Integrating Local Knowledge into Higher Education: A Qualitative Study of Curriculum Innovation in Aceh, Indonesia," *Education Sciences* 15, no. 9 (2025): 1214.

³² John Gerard Scott Goldie, "Connectivism: A Knowledge Learning Theory for the Digital Age?," *Medical Teacher* 38, no. 10 (2016): 1064–69.

³³ R Mayildurai et al., "Teaching Methodologies for Engaging Generation z Learners: Strategies, Challenges, and Implications," *Transforming Education for the 21st Century-Innovative Teaching Approaches*, 2024, 152.

³⁴ Aloysius C Anyichie et al., "Examining Classroom Contexts in Support of Culturally Diverse Learners' Engagement: An Integration of Self-Regulated Learning and Culturally Responsive Pedagogical Practices,," *Frontline Learning Research* 11, no. 1 (2023): 1–39.

³⁵ Abida al Rumaisa, Fikratuha Mudrikah, and Muhammad Rakin, "The Effectiveness of Gamification-Based Islamic Religious Education Learning Models on Digital Al-Qur'an Literacy," *Journal on Islamic Studies* 2, no. 1 (2025): 1–11.

educational theory.

2. Increasing Understanding of Islamic Concepts Through Contextualization

The integration of local Acehness wisdom in Islamic learning applications has been proven to provide a more contextual meaningful learning experience. Dr. H. Ahmad Fauzi, M.Pd.I emphasized the importance of this:

"Aceh has an extraordinary wealth of Islamic culture. From the tradition of Peusijek, Kenduri Blang, to the values in customs that are in line with Islamic teachings. If we can package this in an Android application, God willing, it will be easier for students to accept and at the same time preserve our local culture."

This contextualization is in line with the findings which suggests that integrating local values in Islamic education can strengthen contextual Islamic identity, enhance educational relevance, and prepare students to face global challenges without losing cultural roots.³⁶ The research emphasizes that the integration of local values in Islamic education can strengthen contextual Islamic identity. The relevance of content to students' daily lives is a key factor in improving understanding. Tgk. H. Nasruddin Yusuf identified various local wisdom that is important to integrate:

"the philosophy of Adat such as Poe Teumeureuhom, Hukom like Shia Kuala, the tradition of Peusijek, Kenduri Blang, the Prophet's Birthday with Hadrah, the system of mutual cooperation in Islam, and the values in traditional Acehness expressions that are a condition for the meaning of Islam."

Implementation Challenges And Barriers

1. Technical and Infrastructure Challenges

The implementation of Android learning media based on local wisdom faces various significant technical challenges. Dr. H. Ahmad Fauzi identified the main challenge:

"the lack of digital content that raises the local wisdom of Aceh. Most of the existing Islamic learning applications are general, not specific to raise Acehness cultural values. Then there are also limited human resources who are able to develop this kind of application."

These findings are supported by research which identifies that Islamic educational institutions face several challenges in adopting educational technologies, including limited infrastructure, lack of technological skills among educators, and resistance to cultural change within organizations³⁷. The research also shows that support from top

³⁶ Khomsinuddin et al., "Modernitas Dan Lokalitas: Membangun Pendidikan Islam Berkelanjutan," *Journal of Education Research* 5, no. 4 (2024): 4418–28.

³⁷ (Munir & Zumrotus Su'ada, 2024)

management and community engagement also plays an important role in the successful implementation of educational technology ³⁸. The limitation of human resource competence in application development is a serious obstacle. As revealed by Dr. H. Ahmad Fauzi,

"I have started using learning applications such as Kahoot for quizzes, Google Classroom for assignments, and several digital Quran applications. But it is not optimal because of the limitations of infrastructure and my personal technological capabilities."

2. Content Challenges and Validation

Maintaining the authenticity of local wisdom in digital format is a complex challenge that requires a careful approach. Tgk. H. Nasruddin Yusuf emphasized:

"The most important thing is to involve cultural experts and scholars in the content development process. There must be validation from figures who really understand the local wisdom well. Do not let the digitalization process change the essence or meaning of the tradition."

This content validation challenge is in line with the findings which highlights the importance of traditional Islamic educational institutions such as dayah in preserving traditional Islamic values while responding to the needs of modern society ³⁹. The research identifies the challenges of technological lag and the opportunities for the integration of modern education systems in traditional curricula. The balance between modernity and tradition requires the right strategy to ensure that digitalization does not erode the essence of local wisdom ⁴⁰. This requires intensive collaboration between technologists, scholars, and cultural figures at every stage of content development.

3. User Acceptance and Adaptation

User acceptance of digital learning technology varies between stakeholders. From the perspective of lecturers, there are challenges of technology adaptation that require ongoing training and support. Dr. H. Ahmad Fauzi acknowledged his personal limitations: "the limitations of infrastructure and my personal technological capabilities." However, from a student's perspective, the level of acceptance of learning technology is very

³⁸ David Rindu Kurniawan et al., "Technology Integration in Educational Management: Its Impact on Community Participation," *Jurnal Terobosan Peduli Masyarakat (TIRAKAT)* 1, no. 1 (2024): 10–20.

³⁹ Musliadi Husen and Musliadi Rusli, "Tantangan Dan Inovasi Pendidikan Dayah Aceh Dalam Pusaran Globalisasi Dan Digitalisasi" 3, no. 1 (2024): 325–36.

⁴⁰ Fitra Zahrotul Luqmi et al., "Integrating Local Wisdom and Modern Technology to Address Society 5.0 Era Challenges in Culture," *Jurnal Impresi Indonesia* 4, no. 1 (2025): 1052–61.

high. Muhammad Rizki stated his readiness:

"Almost every day. To browse lecture materials, download journals, take online classes, and read the digital Quran. Smartphones are a necessity for today's students."

PTKI's institutional support is a critical factor in the successful implementation. Research shows that the Independent Learning - Independent Campus policy is here to improve the competence of graduates from universities in the form of soft skills and hard skills so that they can adapt to the needs of the times.⁴¹

Table 1. Implementation Challenges and Barriers

Challenge Category	Description	Impact	Strategic Response
Technical	Limited infrastructure & app development skills	Slow adoption	Infrastructure support & training
Human Resources	Low digital literacy among lecturers	Suboptimal utilization	Capacity building programs
Content Validation	Risk of cultural distortion	Loss of authenticity	Involvement of scholars & cultural leaders
User Adaptation	Resistance from senior educators	Delayed implementation	Gradual training & mentoring

Aceh Local Wisdom Integration Model In Learning Applications

1. Integrated Local Wisdom Content

The integration model of Acehese local wisdom in Islamic learning applications consists of key components rooted in the philosophy "*Adat bak Poe Teumeureuhom, Hukum bak Syiah Kuala,*" which reflects the harmony between custom and Islamic law. Traditions such as Peusijek, Kenduri Blang, and the Prophet's Birthday serve as contextual representations of Islamic values in daily life. These elements are positioned not merely as complementary content, but as core components that provide spiritual and cultural depth in Islamic learning.

2. Features of Developed Applications

Based on the needs analysis from the interviews, the features of the developed application include interactive multimedia with video, audio, and

⁴¹ Irene Mardiatul Laily, Anita Puji Astutik, and Budi Haryanto, "Instagram Sebagai Media Pembelajaran Digital Agama Islam Di Era 4.0," *Munaddhomah: Jurnal Manajemen Pendidikan Islam* 3, no. 2 (2022): 160-74, <https://doi.org/10.31538/munaddhomah.v3i2.250>.

animation. Muhammad Rizki expects:

"video features on Islamic traditions in Aceh, audio lectures in Acehnese language, quizzes on the history of Acehnese Islam, and maybe a feature for sharing experiences between users."

Dr. Zulfikar, M.Kom identifies effective technological features:

"interactive multimedia (video, audio, animation), gamification (point and level system), social learning (discussion and sharing), content personalization, offline access, and push notifications. The important thing is a smooth user experience and quality content."

Research providing concrete examples with the INSAN application that integrates Islamic values in science learning, obtaining very feasible validation from media experts (96.59%) and feasible from material experts (84.48%)⁴². This shows that the integration of Islamic values in learning applications can achieve high quality standards.

3. Effective Implementation Strategy

An effective implementation strategy requires a gradual and collaborative approach. Shows that the use of social media such as Instagram can be an interesting digital learning media innovation through Instastory, feeds, reels, highlights, and Instagram live features⁴³. HR training and capacity building are the keys to successful implementation. Identify several successful strategies such as improving technology training for teachers, integrating technology-based curriculum, and collaborating with external parties for the development of technology infrastructure⁴⁴.

Stakeholder collaboration between lecturers, students, and cultural leaders is essential. Tgk. H. Nasruddin Yusuf emphasized:

"I strongly support this effort. Aceh's local wisdom with Islamic nuances must be preserved and inherited to the younger generation. If technology can be more accessible and understood, why not? The important thing is that the essence and noble values are maintained."

The implementation of digital technology in preserving Aceh's local wisdom requires a holistic and structured strategy encompassing several critical dimensions. An effective approach is carried out in phases, starting from digitizing basic content such as folklore, oral traditions, and cultural

⁴² Denisa Puspa Cahya et al., "NCOINS : National Conference of Islamic Natural Science (2023) Fakultas Tarbiyah IAIN Kudus ANALISIS PEMANFAATAN MEDIA PEMBELAJARAN IPA," 2023, 322–31.

⁴³ Laily, Astutik, and Haryanto, "Instagram Sebagai Media Pembelajaran Digital Agama Islam Di Era 4.0."

⁴⁴ Chanda Chansa Thelma et al., "Curriculum Design for the Digital Age: Strategies for Effective Technology Integration in Higher Education," *International Journal of Research* 11, no. 07 (2024): 185–201.

practices, followed by developing interactive platforms that enable community participation, and culminating in the integration of advanced technologies like augmented reality and virtual reality to create immersive learning experiences. This phased strategy allows institutions to evaluate each stage, make necessary adjustments, and ensure sustainable development, supported by clear targets, measurable indicators, and comprehensive evaluation mechanisms⁴⁵.

A fundamental aspect of implementation is the capacity development of human resources through tiered training programs ranging from basic digital literacy and understanding of cultural digitalization⁴⁶ to intermediate skills in content production and platform management, and advanced competencies in application development, data analysis, and digital dissemination. Mentoring systems, including collaboration between digital-native youth and senior cultural figures, enable reciprocal knowledge transfer between technological expertise and deep cultural understanding⁴⁷. In addition, successful implementation depends on strong multi-stakeholder collaboration, where universities serve as research and development centers, governments provide policy and financial support, cultural leaders ensure authenticity, and digital communities contribute technical innovation⁴⁸. This collaboration requires clear governance, coordination, and continuous evaluation to ensure alignment with shared goals.

Implementation strategies should integrate the preservation of local wisdom into both formal and informal education curricula through interdisciplinary approaches, including specialized courses, applied research projects, internships, and service learning that support cultural digitization⁴⁹. The selection of digital platforms must align with target audience characteristics and program objectives, utilizing social media for wider

⁴⁵ Marie Weiss, Matthias Barth, and Henrik von Wehrden, "The Patterns of Curriculum Change Processes That Embed Sustainability in Higher Education Institutions," *Sustainability Science* 16, no. 5 (2021): 1579–93.

⁴⁶ Miftahul Fikri et al., "The INSTANT Model: Developing Digital Literacy to Enhance Professional Competence of Islamic Religious Education Teachers," *Al-Tarbawi Al-Haditsah: Jurnal Pendidikan Islam* 10, no. 2 (2025): 327–46.

⁴⁷ Yadi Fahmi Arifudin and Akil Akil, "Integrating Artificial Intelligence into Islamic Religious Education: Toward a Model for Ethical and Values-Based Technology Adoption in Faith-Based Schools," *Al-Tarbawi Al-Haditsah: Jurnal Pendidikan Islam* 10, no. 2 (2025): 298–304.

⁴⁸ Chern Li Liew, Jamie Yeates, and Spencer Charles Lilley, "Digitized Indigenous Knowledge Collections: Impact on Cultural Knowledge Transmission, Social Connections, and Cultural Identity," *Journal of the Association for Information Science and Technology* 72, no. 12 (2021): 1575–92.

⁴⁹ Achmad Zuhri and Abdurrahman Mas' ud, "Strengthening Religious Character In Madrasah: Integrating Pesantren Values As An Educational Strategy," *Al-Tarbawi Al-Haditsah: Jurnal Pendidikan Islam* 10, no. 1 (2025): 71–92.

engagement, e-learning platforms for structured learning, and dedicated websites as digital repositories⁵⁰. Furthermore, content development should combine traditional values with modern approaches through multimedia storytelling and gamification to enhance accessibility, engagement, and participation among younger generations⁵¹.

Program sustainability requires realistic financial planning and diversified funding sources, including government support, private sponsorship, and revenue from digital products to ensure long-term viability. The development of sustainable business models, such as cultural tourism and educational licensing, further supports self-financing. In addition, monitoring and evaluation systems must assess both quantitative outcomes such as content production, reach, and engagement and qualitative impacts, including awareness and appreciation of local wisdom among younger generations. With a well-coordinated approach, digital technology can support the preservation and revitalization of Aceh’s local wisdom across generations.

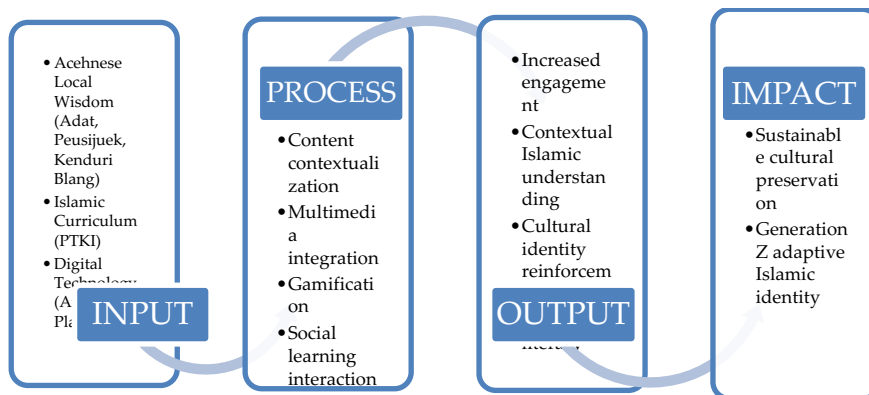


Figure 1. Aceh Local Wisdom–Digital Learning Framework

Figure 1 illustrates the conceptual framework of integrating Acehese local wisdom into Android-based Islamic digital learning within PTKI institutions. The framework positions local cultural values not merely as complementary material but as foundational inputs that shape the entire learning ecosystem.

At the **input level**, the framework consists of three primary components: (1) Acehese local wisdom (e.g., adat philosophy, Peusijuek,

⁵⁰ Carla Bonina et al., “Digital Platforms for Development: Foundations and Research Agenda,” *Information Systems Journal* 31, no. 6 (2021): 869–902.

⁵¹ Song Ning Tan and Kher Hui Ng, “Gamified Mobile Sensing Storytelling Application for Enhancing Remote Cultural Experience and Engagement,” *International Journal of Human–Computer Interaction* 40, no. 6 (2024): 1383–96.

Kenduri Blang, Islamic cultural expressions), (2) the Islamic higher education curriculum, and (3) digital technology infrastructure, particularly Android-based platforms and Learning Management Systems. These elements collectively form the structural basis for culturally contextualized digital learning.

At the **process level**, the framework emphasizes contextualization and digital mediation. Islamic concepts are reconstructed through culturally embedded narratives and multimedia integration, including video, audio, gamification, and interactive features. This stage reflects the principles of Constructivism, where students actively construct meaning through contextual and experiential engagement. Simultaneously, the integration of networked platforms, social learning features, and digital collaboration reflects Connectivism, in which knowledge is distributed across technological nodes and social interactions.

At the **output level**, the framework generates increased student engagement, deeper contextual understanding of Islamic teachings, strengthened cultural identity, and enhanced digital literacy among Generation Z learners. These outcomes represent measurable pedagogical impacts within higher Islamic education settings.

Finally, at the **impact level**, the framework contributes to sustainable preservation of Acehese local wisdom through digital transformation while fostering a generation that is both technologically adaptive and culturally rooted. The model demonstrates that digital innovation and cultural preservation are not contradictory forces, but mutually reinforcing dimensions within contemporary Islamic education.

Overall, the Aceh Local Wisdom–Digital Learning Framework serves as the primary novelty of this study by offering an integrative model that bridges cultural heritage, Islamic pedagogy, and digital learning ecosystems in a structured and theoretically grounded manner.

Implications For Islamic Learning Of Generation Z

1. Learning Paradigm Transformation

The implementation of Android learning media based on local wisdom presents a paradigm transformation from teacher-centered to student-centered learning. Siti Aisyah revealed:

"To be honest, sometimes it's still monotonous. Most lecturers still use the lecture method and PowerPoint presentation. Even though we Generation Z prefer interactive learning."

The integration of technology with Islamic values creates learning that is not only technologically modern but also spiritually profound. Dr. Zulfikar

emphasized the importance of content that is packaged with an approach according to the characteristics of Generation Z:

"digital storytelling, virtual tours to historical places, augmented reality for immersive experiences, podcasts about Acehese scholars, and interactive timelines of Islamic history in Aceh."

This paradigm shift not only changes content delivery but also redefines the roles of educators and learners, moving from teacher-centered to student-centered learning through local wisdom-based Android media. Traditional approaches that position lecturers as the sole source of knowledge are increasingly ineffective in developing critical thinking, creativity, and 21st-century skills for Generation Z, as reflected in students' dissatisfaction with monotonous lecture-based methods.

Generation Z, as digital natives, exhibit learning preferences characterized by instant information access, visual-interactive engagement, and multitasking, with shorter attention spans but stronger multimodal processing abilities⁵². Therefore, static and linear learning approaches are less effective, making local wisdom-based Android media a relevant bridge between technological preferences and cultural values⁵³. Technologies such as digital storytelling, virtual tours, and augmented reality enhance learning by presenting content in engaging, immersive, and experiential formats that foster emotional connection, active exploration, and deeper understanding, in line with constructivist principles of knowledge construction through experience⁵⁴.

Podcasts provide flexible and accessible learning that fosters emotional connections with historical figures, while interactive timelines transform chronological content into dynamic exploration that supports contextual understanding. These features enable personalized and self-paced learning aligned with students' interests. Consequently, the learning paradigm shifts, repositioning lecturers as facilitators and mentors rather than mere content deliverers, and empowering students to become active, collaborative, and reflective learners, resulting in more meaningful and engaging learning experiences for Generation Z.

⁵² Marjan Marino Ninčević and Dunja Jurić Vukelić, "Generation Z and Their Learning in a Digitally Driven World," *Pedagoška Obzorja* 40, no. 3–4 (2025): 83–99.

⁵³ Vinothini Kasinathan, Geetha A Rubasundram, and Wong Chai Fuu, "Revitalizing Ancestral Values through Technology: Using Wayang Kulit to Engage Gen Z in Cultural and Educational Innovation," *Journal of Ecohumanism* 3, no. 7 (2024): 2940–52.

⁵⁴ Moufeed Saleh Al-Masarweh and Hani Hatmel Obeidat, "The Impact of Using Virtual Tours in Teaching Social Studies on Developing Students' Visual Historical Identity and Aesthetic Appreciation.," *Pakistan Journal of Life & Social Sciences* 22, no. 2 (2024).

The integration of local wisdom in Android-based learning media fosters culturally responsive and contextually meaningful learning, enabling students to connect universal Islamic concepts with local traditions and develop a balanced identity between cultural roots and global competence. However, this transformation faces challenges such as resistance to change, limited infrastructure, and the need for continuous educator training, requiring strong institutional support and policy commitment. Grounded in constructivist theory, this shift emphasizes students as active knowledge constructors who interpret and internalize Islamic values through culturally embedded experiences, leading to more meaningful, inclusive, and responsive learning in the digital era ⁵⁵.

Furthermore, this paradigm shift is also consistent with Connectivism, which conceptualizes learning as a networked process occurring across digital ecosystems ⁵⁶. In the digital age, knowledge is distributed across technological platforms, social interactions, and online communities rather than confined to classroom instruction. The use of Android applications, LMS platforms, multimedia features, and social sharing tools reflects a connectivist learning environment in which students navigate multiple nodes of information simultaneously. Generation Z learners, who are accustomed to digital multitasking and online collaboration, thrive in such environments because learning becomes dynamic, interactive, and socially constructed. Therefore, the observed paradigm transformation is not simply a methodological adjustment, but a structural reconfiguration of the learning ecosystem in line with contemporary network-based educational theory.

Recent empirical research supports this theoretical alignment. Studies demonstrate that student-centered digital environments significantly enhance autonomy, engagement, and higher-order thinking skills compared to traditional lecture-based models ⁵⁷. Moreover, culturally contextualized digital learning has been shown to strengthen identity formation and deepen conceptual understanding among higher education students ⁵⁸. Thus, the

⁵⁵ Rumba Triana, Ali Maulida, and Saqoikul Ilmi, "Community-Based Strategies in Islamic Religious Education (PAI): Fostering Youth Religious Character Formation through Majelis Taklim," *Al-Tarbawi Al-Haditsah: Jurnal Pendidikan Islam* 10, no. 2 (2025): 347–61.

⁵⁶ Goldie, "Connectivism: A Knowledge Learning Theory for the Digital Age?"

⁵⁷ Wipapan Phinla et al., "Flipped Learning in Higher Education: A Theoretical and Pedagogical Review to Support Critical Thinking and 21st Century Skill Development," 2025.

⁵⁸ Sri Meiti Anggraini Ahaya and Harto S Malik, "Deep Learning-Based Local Literature Instruction and Cultural Identity Development in Higher Education," *FOSTER: Journal of English Language Teaching* 7, no. 1 (2026): 175–88.

implementation of local wisdom-based Android learning media represents a pedagogical transformation grounded in both constructivist and connectivist principles, positioning Islamic education within a modern yet culturally rooted learning framework.

2. Preservation of Local Wisdom through Digital Transformation

Digital transformation in Islamic learning not only modernizes learning methods but also plays an important role in preserving local wisdom. The revitalization of Aceh's Islamic tradition through digital platforms allows for more effective knowledge transfer between generations. Emphasized that digital documentation of Islamic cultural heritage is an important strategynature facing the challenges of modernization and globalization.⁵⁹ The research shows that the integration of local values in Islamic education can prepare students to face global challenges without losing cultural roots.

The long-term implication of this implementation is the development of a technologically literate generation with a deep understanding of local wisdom and authentic Islamic values, in line with holistic and contextual Islamic education for Generation Z. Digital platforms act as a bridge between tradition and modern learning by transforming cultural content into interactive multimedia formats. This process requires a sensitive and integrated approach, recognizing local wisdom as a dynamic system and involving scholars and cultural leaders to maintain authenticity. Additionally, technology should support interactive and immersive learning through features such as gamification and virtual experiences, accompanied by evaluation systems that assess both cognitive understanding and value internalization in students' daily lives.

The integration of local wisdom in the digital curriculum requires a reconceptualization of traditional learning structures. An interdisciplinary approach is key, where local values are not taught as separate subjects, but are integrated in different fields of study. For example, mathematics learning can use the traditional Acehnese calculation system, or Arabic learning can be associated with local tradition of poetry and tales. Adaptive learning technology allows for the personalization of learning based on the student's cultural background and individual interests. This system can identify local wisdom that is most relevant to students' lives and present them in a meaningful context. This is important to ensure that learning is not

⁵⁹ Khomsinuddin et al., "Modernitas Dan Lokalitas: Membangun Pendidikan Islam Berkelanjutan."

superficial, but results in deep and transformative understanding ⁶⁰.

The process of digitizing local wisdom faces various complex challenges. First, the issue of authenticity is a major concern, especially when oral traditions are transliterated into digital formats. The risk of losing nuance, intonation, and socio-cultural context in this transformation process requires a careful approach and involves expertise from various disciplines. Second, technological accessibility is still an obstacle in various regions, especially rural areas in Aceh. Hybrid solutions that combine digital learning with traditional methods can be an alternative to ensure inclusivity in the learning process ⁶¹.

Addressing resistance to modernization requires persuasive communication and clear evidence that technology can strengthen, not diminish, traditional values. The integration of local wisdom with digital transformation aims to develop an authentically modern Islamic education model that equips students with digital competencies while preserving their role as cultural guardians. Well-developed digital platforms function as dynamic repositories and research tools, enabling continuous content enrichment and documentation of cultural evolution. Ultimately, this transformation fosters a strong identity among the younger generation, allowing them to engage globally while remaining rooted in local values, in line with the concept of glocalization.

Conclusion

The implementation of Android-based Islamic learning media integrating Acehnese local wisdom in PTKI institutions enhances student engagement and conceptual understanding while reflecting a broader pedagogical transformation grounded in Constructivism and Connectivism. Through culturally embedded traditions such as Peusijek and Kenduri Blang, students actively construct meaning from familiar socio-cultural contexts, making learning more meaningful. At the same time, the use of multimedia, gamification, LMS, and social-interactive features creates a networked learning environment that aligns with Generation Z's digital characteristics visual, interactive, and collaborative thereby increasing engagement and learning effectiveness.

⁶⁰ Supriadi, Taufiqurrahman, and Samsuddin, "INOVASI PEMBELAJARAN PAIDI ERA DIGITAL : STRATEGI MENUMBUHKAN MINAT BELAJAR GEN-Z."

⁶¹ Ria Rizki Ananda, Ahmad Suradi, and Dwi Ratnasari, "Pengembangan Kurikulum Merdeka Belajar – Kampus Merdeka (MBKM) Pada Perguruan Tinggi Keagamaan Islam (PTKI)," *Islamika* 4, no. 3 (2022): 224–36, <https://doi.org/10.36088/islamika.v4i3.1868>.

A key contribution of this study is the formulation of the “**Aceh Local Wisdom–Digital Learning Framework**”, which serves as the primary novelty of the article. This framework conceptualizes integration through four interconnected dimensions:

1. **Input:** Acehese Islamic cultural values, PTKI curriculum, and digital technology infrastructure.
2. **Process:** Contextualization of local wisdom, multimedia integration, gamification, and social learning interaction.
3. **Output:** Increased engagement, contextual Islamic understanding, and strengthened cultural identity.
4. **Impact:** Sustainable preservation of Islamic local wisdom and the formation of globally competent yet culturally rooted Muslim youth.

This framework positions digital transformation not merely as technological adoption, but as a culturally responsive and theoretically grounded educational model.

The study identifies three main implementation challenges: technical limitations such as inadequate infrastructure and contextualized content, human resource constraints including limited technological competence among lecturers, and content validation issues requiring collaboration with scholars and cultural experts to ensure authenticity. These findings highlight the importance of institutional support, structured training, and multi-stakeholder collaboration for sustainable implementation. The results also imply a shift toward student-centered, culturally responsive, and digitally networked Islamic education, where technology serves as a medium for preserving and transmitting local wisdom. However, this study is limited to PTKI institutions in Aceh, uses a qualitative approach, and focuses only on Android platforms, thus limiting generalizability and comparative analysis. Future research is recommended to test the proposed framework across diverse contexts, apply quantitative or experimental methods, compare various digital platforms, and examine long-term impacts on learning outcomes and cultural preservation.

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