

Digital Literacy Transformation in Madrasah Ibtidaiyah for Arabic Language Learning Through Adab and Tahfidz Programs with Technological Touch

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Abstract

The integration of digital literacy and technology into Arabic language education has emerged as a transformative approach to addressing both educational and cultural objectives in Madrasah Ibtidaiyah. This research investigates the synergistic relationship between modern technological tools and traditional Islamic teachings, focusing on Adab and Tahfidz programs as central components of the curriculum. By leveraging digital resources, educators aim to enhance language proficiency while simultaneously fostering moral character, ethical behavior, and spiritual awareness in students. The study employs a qualitative case study approach to gather in-depth insights into pedagogical strategies and technology integration at selected Madrasah Ibtidaiyah schools. Data were collected through interviews, classroom observations, and document analysis involving teachers and students as primary subjects. The research instruments included structured observation checklists, interview protocols, and reflective journals. Data analysis followed thematic coding to identify patterns and themes related to digital literacy practices and their impact on student engagement and learning outcomes. Findings reveal that integrating Adab and Tahfidz programs with technological tools enhances student motivation, facilitates immersive learning, and promotes ethical digital practices. This comprehensive approach supports the development of linguistic skills, cultural awareness, and spiritual values, offering a model for effectively blending tradition and innovation in Arabic language education.

Keywords: adab; literacy; technological

Introduction

The rapid evolution of technology has significantly reshaped educational landscapes globally, compelling schools to adapt to digital advancements to enhance learning outcomes. In the context of Madrasah Ibtidaiyah, integrating digital literacy with traditional Islamic teachings represents a transformative approach to education. Despite the proliferation of digital tools and resources, many educational institutions face significant challenges in effectively implementing technology within their curricula (Feng, 2020). These challenges include limited access to digital infrastructure, inadequate teacher training, and the need to balance technological innovation with preserving cultural and spiritual values. Addressing these issues is particularly critical for Arabic language-



education, which demands linguistic precision and a deep understanding of Islamic principles.

Integrating digital literacy, Adab, Tahfidz programs, and technology in Madrasah Ibtidaiyah signifies a significant shift in Arabic language education, challenging traditional pedagogical norms (Noordman et al., 2022). This transformation is part of a broader trend where educational institutions leverage technology to enhance learning outcomes and adapt to the digital age (Criollo-C et al., 2023). Deep learning techniques and open-domain question-answering systems are revolutionizing how Arabic content is processed and understood, improving response retrieval and comprehension. The pandemic has accelerated the adoption of digital platforms in education, emphasizing the importance of sustainable and innovative teaching models like hybrid and online learning, which align with the fourth Sustainable Development Goal (Lopez-Varela et al., 2022). This amalgamation of technology and traditional educational values promises a future where learning is more efficient, engaging, and effective.

A prominent issue in this area is the disparity in digital literacy skills among educators and students, which often hinders the effective use of technology in classrooms. Teachers may lack confidence or training in incorporating digital resources, while students face varying levels of access and proficiency. This digital divide impacts learning outcomes and limits students' opportunities to engage with language learning in meaningful and immersive ways. Moreover, Arabic language education in Islamic schools must maintain the integrity of traditional practices, such as Adab (*Islamic manners*) and Tahfidz (*Quran memorization*), while incorporating modern pedagogical tools. In the contemporary landscape where digital advancements intersect with traditional Islamic education, Madrasah Ibtidaiyah faces the challenge of balancing age-old teachings with modern complexities (Tambak & Sukenti, 2020). While the preservation of centuries-old values is crucial, the necessity to adapt and innovate is paramount to equip students for the evolving world. The fusion of digital literacy with Islamic teachings offers a unique opportunity to harmonize sacred traditions with the digital realm, bridging the gap between tradition and modernity (Hefner, 2022). This convergence underscores the need for Madrasah Ibtidaiyah to embrace technological tools while upholding core Islamic values, ensuring students are prepared to navigate the complexities of the digital age while staying rooted in tradition.

The integration of Adab and Tahfidz programs into the curriculum enhances Islamic education by instilling moral values and spiritual discipline. This fusion of tradition and technology promotes linguistic proficiency and deepens students' understanding of cultural heritage and ethical obligations (Dalimunthe et al., 2023). In a globalized world, where linguistic and cultural competencies are crucial, this approach becomes pivotal in shaping the future of Madrasah Ibtidaiyah education. By combining the virtues emphasized in Adab literature with the spiritual development nurtured through Tahfidz programs, students are equipped to navigate diverse cultural landscapes while upholding Islamic principles, thus preparing them for the challenges of contemporary society.

This research delves into the transformative potential of integrating digital resources in educational settings, particularly in Islamic Education and medical education contexts. By embracing e-learning and digital teaching formats (Seer et al., 2022), educators can navigate challenges and enhance student engagement, performance, and outcomes. The utilization of interactive screencasts and automatic resource generation mechanisms can facilitate the acquisition of ICT skills and cater to individual learning needs. The study highlights the importance of timely completion of tasks, gender differences in performance, and the predictive value of early module performance on summative exams (Wang & Yu, 2024). This fusion of tradition and technology expands access to knowledge and fosters creativity, collaboration, and personalized learning experiences, ultimately unlocking new dimensions of education.

The research explores the interplay between digital literacy, traditional Islamic teachings, and technological integration in Madrasah Ibtidaiyah, offering a holistic view of their synergistic relationship in enhancing Arabic language learning. While existing studies have delved into individual components like digital literacy in language education or technology integration in Islamic schools, this research uniquely examines how these elements interact and complement each other within the context of Madrasah Ibtidaiyah (Kabakus et al., 2023). By integrating digital literacy skills, traditional Islamic teachings (Adab and Tahfidz programs), and technology, the study aims to provide a comprehensive understanding of how these factors collectively contribute to improving Arabic language learning outcomes in Islamic educational settings.

By exploring diverse pedagogical methods and technological tools, the research aims to reveal innovative approaches for enhancing learning outcomes in Madrasah Ibtidaiyah settings (Allaith, 2023). It also strives to bridge existing knowledge gaps by offering a thorough examination of how digital literacy and technology can revolutionize Arabic language education in Islamic educational environments. The study delves into the potential of incorporating digital resources to cater to the specific needs of learners with dyslexia and dysgraphia, emphasizing the importance of early interventions and tailored teaching strategies (Dalimunthe et al., 2023). Through this comprehensive analysis, the research intends to shed light on the transformative power of integrating technology in educational practices within Islamic contexts, paving the way for more effective and inclusive learning experiences.

This study addresses a significant void in current research by examining the integration of Adab and Tahfidz programs with digital literacy to enhance Arabic language education in Madrasah Ibtidaiyah. While existing studies emphasize the role of technology in improving language acquisition or focus on the moral and spiritual development inherent in Islamic education, some explore how these domains can be harmoniously combined. Research on digital literacy often concentrates on technical skills and academic outcomes, with limited attention to its potential for fostering ethical values and spiritual growth. Conversely, studies on Islamic teachings tend to prioritize moral character and spirituality but rarely investigate the utility of digital tools in enriching these aspects (Tambak & Sukenti, 2020). By merging these perspectives, this study provides a nuanced understanding of how modern educational technologies can be effectively utilized without compromising the cultural and spiritual integrity of Islamic education. It highlights how this integration supports not only academic proficiency but also the holistic development of students, preparing them to thrive in both the digital and ethical dimensions of contemporary life (Mahfud et al., 2023). This approach offers a fresh perspective on the interplay between technology and traditional educational values, creating a framework that addresses both practical and philosophical challenges in the field.

Research Methods

This research focuses on Muhammadiyah of Madrasah Ibtidaiyah in Pacitan, which has implemented digital literacy, Adab, Tahfidz programs, and technology integration in Arabic language education, so this qualitative case study research is more suitable. A Qualitative Case Study Approach is a valuable research method that delves into intricate phenomena within real-life settings, concentrating on specific cases to gain in-depth insights. Researchers employing this approach aim to comprehend the underlying processes, behaviors, and experiences of a particular situation, organization, group, or individual. This method aligns with experiential learning theory, emphasizing subjectivity, environmental interaction, and constructivism (Arseven, 2018). It also considers the impact of power dynamics on human interactions and decisions in research, guiding the selection of paradigmatic stances and methodologies (Donges, 2015). Qualitative case study methodology provides a robust framework for health science research, aiding in theory development, program evaluation, and intervention design.

A researcher wishing to investigate the integration of digital literacy, Adab, Tahfidz programs, and technology in Arabic language teaching might choose the Madrasah Ibtidaiyah school as a case study because of its potential to offer valuable insights into combining digital tools with traditional Islamic teachings in Arabic language education (Al-Abdullatif & Alsubaie, 2022). These schools, especially Madrasah Ibtidaiyah Muhammadiyah in Pacitan, can provide a suitable environment to explore the impact of hedonic motivation, effort expectations, and performance expectations on teachers' intentions to use digital platforms for literacy teaching.

Researchers utilize a variety of methods for qualitative data collection, including interviews, observations, document analysis, and artifact examination. These techniques enable researchers to gather in-depth and comprehensive information about a particular case and its surrounding context. Qualitative research often involves iterative processes where research questions may evolve over time to delve deeper into specific aspects of the topic being studied (Jain, 2021). The richness and detail of qualitative data allow for a holistic understanding of experiences, decision-making processes, and the impact of interventions on care. Additionally, the use of artifacts in interviews can enhance data collection by providing visual aids that help participants express their thoughts and

experiences more dynamically, aligning discussions with the study's theoretical foundations. Thirty students and 10 teachers were used as research objects.

Qualitative data analysis is a systematic process of organizing and interpreting collected data to gain meaningful insights. Researchers usually use techniques such as thematic analysis, content analysis, and narrative analysis (Nassaji, 2015). This method identifies the data's patterns, themes, and relationships to understand the case's underlying dynamics. The thematic analysis involves identifying, analyzing, and reporting patterns or themes across data, while narrative analysis provides detailed subjective reports about individual experiences (Kanygin & Koretckaia, 2021). Students and teachers, as well as related stakeholders at Madrasah Ibtidaiyah Muhammadiyah in Pacitan. In addition, interpretive phenomenological analysis explores people's lived experiences to explore their understanding of these experiences. By utilizing this approach, researchers can uncover valuable insights and gain a deeper understanding of the qualitative data collected, thereby improving the overall analysis process.

This research utilized a variety of qualitative instruments to gather in-depth insights into integrating digital literacy, Adab, Tahfidz programs, and technology in Arabic language education at Madrasah Ibtidaiyah Muhammadiyah in Pacitan.

Table 1
Grid Instrument for Each Instrument

Instrument	Purpose	Data Collected	Target
Interviews	Explore perceptions and experiences of teachers, students, and administrators.	Insights into digital literacy integration, challenges, and outcomes.	10 teachers, 30 students, and school administrators.
Observations	Analyze the real-time application of teaching strategies.	Classroom dynamics, use of digital tools, and integration of Adab and Tahfidz.	Teaching sessions in Arabic language classrooms at Madrasah Ibtidaiyah Muhammadiyah in Pacitan.
Document Analysis	Examine the planning and resources for educational strategies.	Lesson plans, digital tools, and curriculum content.	Institutional documents and teacher-developed resources.

Instrument	Purpose	Data Collected	Target
Artifacts	Understand the application of technological tools in teaching.	Examples of digital applications, multimedia resources, and printed materials.	Digital and non-digital resources used by teachers and students.
FGDs	Encourage collaborative reflections on learning experiences.	Collective feedback on the effectiveness of teaching strategies and digital tools.	Groups of students and teachers share experiences and suggest improvements in educational methods.

Source: Personal Document

These instruments collectively allow for a comprehensive exploration of the deeper integration process, providing detailed and contextual insights into the impact of combining digital literacy and traditional Islamic teachings in a more accommodating Arabic language education. The Implementation Steps are as follows: 1) Initial Assessment: The study began with a needs analysis to identify gaps in the integration of technology and Islamic teachings within the existing curriculum. Educators and stakeholders were consulted to outline priorities and challenges. 2) Selection of Digital Tools: Digital platforms and tools suitable for Arabic language instruction were identified and introduced. Examples include Quran memorization apps, multimedia content for Adab teachings, and collaborative online platforms. 3) Capacity Building: Teachers participated in professional development workshops to enhance their digital literacy and pedagogical skills for effectively incorporating technology into their teaching. 4) Classroom Integration: Adab and Tahfidz programs were paired with selected digital tools in daily lessons. For instance, students used digital platforms to practice Quran recitation while following proper Adab protocols demonstrated through multimedia resources. 5) Monitoring and Feedback: Data from observations, interviews, and student discussions were regularly collected to monitor the effectiveness of the integration and refine strategies.

A thematic analysis was employed to identify patterns and themes related to the effectiveness of the integration process. The data were analyzed in three phases: 1) Coding and Categorization: Initial codes were developed based on recurring concepts in the data, such as "student engagement," "digital challenges," and "spiritual growth." 2) Theme Development: Codes were grouped into themes reflecting broader insights, such as the

interplay of tradition and technology and the role of ethical considerations in digital education. 3) Interpretation and Synthesis: Themes were synthesized to draw meaningful conclusions about the success factors, challenges, and broader implications of the integration.

The study underscores the collaborative involvement of all stakeholders in achieving effective implementation: 1) Teachers acted as facilitators, blending digital resources with traditional methods to meet educational goals. 2) Administrators provided support by ensuring the availability of infrastructure and organizing capacity-building sessions. 3) Parents reinforced learning by encouraging the ethical use of digital tools at home. 4) Students actively engaged in using the digital tools, providing valuable feedback on their experiences.

This structured approach ensures that the study provides a clear and specific understanding of how digital literacy and Islamic teachings can be integrated effectively into Arabic language education.

Result

Pedagogical Strategy in the Form of Digital Resources

The integration of digital literacy with traditional Islamic teachings in Arabic language education at Madrasah Ibtidaiyah exemplifies a transformative approach that harmonizes modern pedagogical tools with time-honored values. Educators strategically employ a variety of digital resources, such as multimedia content, interactive online platforms, educational apps, and virtual learning environments, to create lessons that are both engaging and adaptable to diverse learning styles. This integration enhances not only the accessibility and relevance of Arabic instruction but also its effectiveness by providing students with immersive opportunities to practice and apply their language skills in authentic, real-world contexts (Al Sharoufi, 2022). The use of gamified learning modules, collaborative virtual tasks, and adaptive educational technologies fosters active engagement, critical thinking, and a sense of agency among students. By aligning these tools with Islamic teachings through Adab and Tahfidz programs, educators ensure that students not only develop linguistic proficiency but also internalize ethical values and spiritual awareness (Haq et al., 2024). This fusion of technology and tradition enriches the educational experience, creating a dynamic and holistic learning environment that

prepares students to navigate both the linguistic and moral challenges of the modern world.

The integration of digital resources in education profoundly transforms the learning experience by empowering students to take ownership of their educational journey and cultivating essential 21st-century skills (Osmani & Tartari, 2024). Through innovative pedagogical approaches and the strategic use of digital tools, educators design dynamic and interactive environments that facilitate deeper comprehension and long-term retention of Arabic language concepts. This active engagement shifts students from passive recipients to proactive learners, fostering critical thinking, digital literacy, and effective communication skills indispensable in a rapidly evolving digital landscape (Al-Abdullatif & Alsubaie, 2022). By blending technology with pedagogy, this approach not only enhances the accessibility and relevance of Arabic language education but also instills a sense of agency, enabling students to confidently navigate their academic pursuits and prepare for broader societal contributions in the modern era.

By incorporating digital literacy programs and technology into Arabic language education, educators can empower students to confidently navigate the digital era (Bergman et al., 2023). This integration of digital resources acts as a catalyst for student agency, allowing them to explore diverse learning paths, pursue personal interests, and interact with Arabic language content meaningfully. Through multimedia materials, online discussions, and virtual simulations, students are encouraged to develop creativity, collaboration, and problem-solving skills, fostering a culture of inquiry and innovation in the classroom (Liu et al., 2023). Additionally, enhancing digital health literacy among older adults can lead to improved health-related quality of life, showcasing the broader impact of digital literacy initiatives on various age groups and domains beyond education.

Technology integration in education, such as adaptive learning platforms and interactive tutorials, enables personalized and differentiated instruction tailored to individual learners' needs (Al-Daghri et al., 2022). This approach is particularly beneficial for historically underserved groups, enhancing academic performance and reducing inequities in educational outcomes. By offering tailored learning experiences through virtual labs and scaffolded understanding, students can master Arabic language concepts effectively (Anfuso et al., 2022). This personalized learning not only maximizes learning outcomes but also empowers students to take ownership of their academic progress,

fostering a sense of responsibility and independence. Additionally, targeting high-risk students for personalized interventions can significantly improve outcomes and reduce inequality in treatment success rates.

The integration of digital literacy and technology in Arabic language education transcends academic proficiency, fostering a comprehensive set of competencies essential for lifelong success. Through engagement with digital resources and interactive, technology-enhanced activities, students cultivate critical skills such as problem-solving, analytical thinking, media literacy, and responsible digital citizenship (Bergman et al., 2023). These skills enrich their classroom experience and prepare them to adapt and excel in an increasingly interconnected and dynamic global landscape. The effective use of digital tools enhances educators' teaching self-efficacy and enjoyment, fostering positive attitudes and intentions toward integrating technology into basic education. This dual impact -on both students and educators- ensures a holistic learning environment where individuals are empowered with the knowledge, skills, and mindset necessary to thrive in the complexities of the digital era.

The integration of traditional Islamic teachings, such as Adab and Tahfidz programs, plays a crucial role in shaping students' moral character, ethical behavior, and spiritual awareness. (Masturin et al., 2022) Adab literature, focusing on virtue-based approaches, complements *Shari'ah-based* ethics by emphasizing moral formation alongside actions (Al Sharoufi, 2022). Additionally, incorporating green learning into the curriculum, as proposed in Islamic basic education, instills a sense of responsibility towards the environment and society, aligning with moral values and ethical conduct. This comprehensive approach ensures that students not only excel academically but also graduate as morally upright and socially responsible individuals, ready to positively impact their communities and society. This is crucial in cultivating moral character and ethical conduct among students in Madrasah Ibtidaiyah. Similarly, the Tahfidz program, which involves memorizing the Quran, inherently teaches discipline, patience, and perseverance while also imbuing students with the spiritual wisdom contained within the Quranic verses. This spiritual engagement enhances their moral responsibility, compassion, and empathy towards others as they internalize the teachings of the Quran in their daily lives. Various educational strategies and tools support the integration of these traditional teachings. For instance, the use of technology in language learning, as

seen with the Academic Writing Wizard, can also be adapted to Arabic language skills, making students proficient in the language of the Quran and further supporting their religious studies.

Integrating technology into Arabic language education offers transformative potential but also poses significant challenges that require a multifaceted approach. Educators often face barriers such as inadequate training in digital tools, limited access to technology in under-resourced areas, and varying levels of motivation among teachers and students to adopt these innovations (Zeinoun et al., 2022). Meanwhile, important considerations such as equitable access to digital resources, safeguarding student privacy, and ensuring cultural sensitivity aligned with Islamic educational principles must be prioritized to avoid unintended consequences. Effective integration requires a collaborative effort from educators, policymakers, and stakeholders to develop robust strategies that address these challenges holistically. This includes providing professional development for teachers, investing in infrastructure to bridge the digital divide, and designing culturally appropriate content aligned with Islamic values. By fostering a collective commitment to navigating these complexities, Madrasah Ibtidaiyah can harness the full potential of technology to create engaging, equitable, and culturally enriching Arabic language learning experiences that support diverse student needs and improve overall educational outcomes in the digital age.

Table 2
Pedagogical Strategies and Digital Resources

Pedagogical Strategies	Digital Resources	Examples of Using Arabic
Multimedia Materials	- Educational videos - Interactive presentations - Audio recordings	- Arabic language instructional videos - Interactive Arabic vocabulary presentations - Audio recordings of Arabic conversations
Online Platforms	- Learning management systems - Virtual classrooms - Online discussion forums	- Online Arabic language courses - Virtual Arabic language classrooms - Online discussion forums for practicing Arabic writing

Pedagogical Strategies	Digital Resources	Examples of Using Arabic
Educational Apps	<ul style="list-style-type: none"> - Language learning apps - Quran recitation apps - Interactive games 	<ul style="list-style-type: none"> - Arabic language learning apps with interactive lessons - Quran recitation apps with Tajweed rules - Interactive Arabic language games for vocabulary building
Virtual Learning Environments	<ul style="list-style-type: none"> - Virtual reality simulations - Augmented reality experiences - Virtual field trips 	<ul style="list-style-type: none"> - Virtual tours of Arabic-speaking countries - Augmented reality Arabic language lessons - Virtual reality simulations of Arabic cultural events

Source: Personal Document

The integration of Arabic language within pedagogical strategies and digital resources can significantly enhance students' engagement and proficiency. Educators can utilize cognitive strategies like inferencing, elaboration, imagery, and translation, along with metacognitive strategies such as planning and monitoring, to facilitate Arabic language learning. Additionally, incorporating visual and audio media in teaching materials can stimulate student interest and creativity, ultimately strengthening their Arabic language competencies. Furthermore, the pedagogical competence of teachers, when aligned with curriculum integration, plays a crucial role in improving Arabic language outcomes by prioritizing learning objectives, adapting the learning system to student needs, and conducting regular evaluations. Overall, these examples showcase how the strategic use of Arabic language within teaching practices can enrich students' learning experiences and language skills.

Digital Literacy and Islamic Values

The integration of digital literacy with traditional Islamic teachings extends beyond academic instruction, emphasizing the development of ethical and moral values crucial for holistic student growth. This is highlighted in the pivotal role of Adab and Tahfidz programs within Madrasah Ibtidaiyah schools, focusing on instilling moral character, ethical conduct, and spiritual discipline from childhood. These programs not only teach Arabic and Quranic recitation but also aim to nurture Islamic values such as humility, compassion, and integrity in students' daily lives (Hefner, 2022). The combination of digital literacy and traditional teachings in these programs underscores a comprehensive approach to education, shaping students to embody Islamic principles

beyond just academic knowledge, fostering a well-rounded development encompassing ethical, moral, and spiritual dimensions. Adab, which refers to the etiquette and manners prescribed by Islamic teachings, serves as a cornerstone for ethical behavior and interpersonal conduct. Students learn to demonstrate respect, courtesy, and kindness towards others, both in face-to-face interactions and in online environments. Moreover, Tahfidz programs, focused on the memorization and recitation of the Quran, foster a deep connection to the Islamic scripture and instill reverence for its teachings. Through the discipline and dedication required for Quranic memorization, students cultivate spiritual awareness and a sense of responsibility towards their faith.

The integration of Adab and Tahfidz programs into the curriculum plays a crucial role in shaping students' educational experiences by fostering moral consciousness and spiritual growth (McLarney, 2016). In today's rapidly advancing digital era, instilling ethical values is paramount to guide students towards integrity and dignity in navigating the complexities of the digital age. By grounding learning experiences in Islamic ethics and morality, educators provide students with a moral compass essential for ethical behavior and decision-making. This approach ensures that students' educational journeys transcend linguistic proficiency to encompass holistic development, emphasizing the timeless principles of ethical conduct and spiritual awareness.

The integration of ethical ideologies, such as idealism and relativism, within educational structures significantly impacts students' moral decision-making and attitudes towards animal welfare. Furthermore, embedding ethics modules in computer science courses positively influences students' moral attitudes and preparedness to navigate ethical dimensions in their careers. In the context of Arabic language education, the use of Artificial Intelligence (AI) and Natural Language Processing (NLP) to conceal secret information within Arabic poetry enhances storage capacity and linguistic accuracy, promoting the integration of ethical values within language education. Additionally, in Indonesian Islamic boarding schools, young women students navigate digital spaces with a "digital edge," combining digital literacy with religious training to claim religious authority online, showcasing the intersection of morality, education, and digital media in shaping societal norms (Kopec et al., 2023).

Digital Literacy and Technological Competence

The effective utilization of technology in Arabic language education hinges on the integration of digital literacy and technological competence. Research emphasizes the pivotal role of digital literacy skills for educators and students in maximizing the benefits of technology integration. Educators' varying levels of digital fluency highlight the necessity of continuous professional development and support to enhance their digital literacy skills and pedagogical practices (Sarva et al., 2023). Studies show that educators' digital competences are crucial for engaging students effectively, improving teaching quality, and advancing careers. Furthermore, the positive correlation between expertise, perceptions, and integration of cloud applications underscores the significance of digital literacy in teaching Arabic. Continuous training and support are essential to ensure educators can leverage technology effectively in language education.

Digital literacy for educators encompasses a wide range of skills, including information literacy, media literacy, and digital communication. Proficiency in these areas equips teachers to confidently navigate the digital realm, effectively curate and assess online resources, and utilize technology to enrich teaching and learning experiences (Basilotta-Gómez-Pablos et al., 2022). Educational institutions can empower educators in Arabic language education by offering training, skill enhancement opportunities, and hands-on learning experiences. By doing so, teachers can fully leverage the potential of digital resources and technologies to enhance their teaching practices and engage students more effectively. This holistic approach to digital literacy is crucial in preparing educators to adapt to the evolving educational landscape and meet the needs of 21st-century learners.

Students' digital literacy skills are crucial for engaging with digital resources, collaborating online, and utilizing technology for learning and communication. These skills are deemed essential for navigating the digital landscape and actively participating in today's digital society (Prinsloo, 2022). Integrating digital literacy instruction into the curriculum is vital to ensure students acquire the necessary skills, knowledge, and attitudes to excel in an increasingly digital world. The research emphasizes the need to redefine policies and strategies in higher education to enhance individuals' willingness to use digital technologies effectively. The importance of integrating digital literacy into educational curricula is further emphasized by the need for students in Madrasah

Ibtidaiyah to acquire a set of transversal skills that improve a whole area of activities, from professional tasks to civic participation. The challenge lies in the development and implementation of effective teaching methodologies and assessment instruments that can accommodate the dynamic nature of digital literacy.

Embedding digital literacy instruction within the curriculum is crucial for preparing students to thrive in the digital age. Research emphasizes the importance of integrating critical perspectives into educational models to foster digital literacy (Vanbecelaere et al., 2023). Studies show that digital technologies have a positive effect on reading skills, emphasizing the need for effective implementation in classrooms. Enhancing decision-making abilities through innovative teaching methods that integrate data visualization and critical thinking is also highlighted as essential for talent cultivation in the modern era. Furthermore, the impact of information and digital literacy on the intention to use digital technologies among university staff and students underscores the need to redefine policies and strategies in higher education environments. By equipping students with digital literacy skills, educators empower them to navigate digital complexities, critically evaluate information, and adapt to the ever-evolving digital landscape.

The effective implementation of technology in Arabic language education hinges on integrating digital literacy and technological competence among educators and students (Asadi et al., 2022). Prioritizing digital literacy skills ensures learners are equipped to thrive in a digital-centric world, fostering critical thinking, creativity, and responsible digital citizenship. Research emphasizes the importance of assessing and improving teachers' digital competencies in higher education settings. Additionally, the study on Arabic health literacy underscores the significance of health literacy in decision-making and managing one's health, highlighting the need for comprehensive health literacy assessments among Arabic-speaking populations (Almulla, 2022). Furthermore, the quality of web-based Arabic health information on dental implants reveals the necessity for accessible and reliable health information to prevent harmful actions based on misinformation.

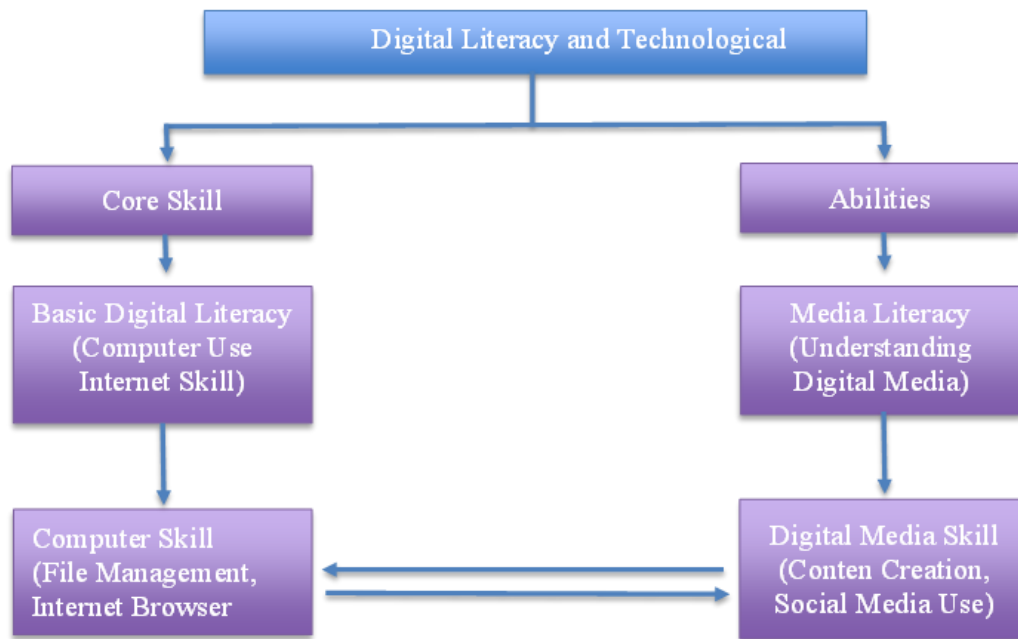


Figure 1
 Concept Map on Digital Literacy and Technological Competence
 Source: UNESCO (2018): Digital Literacy Global Framework (DLGF)

The concept map delves deeper into the core skills of Digital Literacy and Technological Competence in Arabic literacy processes. It dissects Basic Digital Literacy into specific abilities like Computer Skills (encompassing File Management and Internet Browsing) and Media Literacy into Digital Media Skills (involving Content Creation and Social Media Use). This breakdown offers a more comprehensive insight into the diverse components constituting digital literacy and technological competence. Additionally, the research emphasizes the importance of teachers adapting to technology for effective digital education, highlighting the significance of digital literacy in facilitating students' Madrasah Ibtidaiyah needs. Moreover, utilizing digital-based media like Canva enhances students' motivation and vocabulary learning effectiveness (Ubaidillah et al., 2023). This integrated approach underscores the critical role of digital tools in enhancing Arabic language education.

Challenges and Opportunities in Technology Integration

Integrating technology into Arabic language education offers numerous benefits but also poses challenges that educators must address effectively. This research indicates that students spend significant time on gadgets, and the use of smart technology in Arabic learning enhances interactivity and effectiveness. However, teachers need to enhance

their technological skills for successful integration. The implementation of ICT in Arabic education faces obstacles like infrastructure limitations and teacher proficiency issues (Zakiyah et al., 2022). Moreover, employing educational technologies in teaching Arabic for non-native speakers is hindered by high costs and inadequate institutional support. To optimize technology integration, educators must focus on improving teachers' technological proficiency, addressing infrastructure challenges, and ensuring adequate support for educational technology initiatives.

Ensuring equitable access to digital resources and infrastructure is crucial in education, especially for marginalized communities. Disparities in technology access, exacerbated by factors like socioeconomic status, geographical location, and gender, pose significant barriers to learning (Alam & Forhad, 2023). This research found that disadvantaged students often have limited access to digital learning opportunities, impacting their academic outcomes. For instance, rural youth face challenges in accessing technology and reliable broadband, hindering remote learning and telehealth services. Efforts to bridge the digital divide include establishing technology resource centers in schools, public-private partnerships, and prioritizing technology access for individuals from lower socioeconomic backgrounds. Addressing these disparities is essential to promote educational equity and ensure that all students have equal opportunities to thrive academically.

Advocating for increased investment in digital infrastructure and providing schools with adequate resources and support to integrate technology effectively is crucial (Sarva et al., 2023). Collaboration with policymakers and stakeholders can address infrastructure gaps, ensuring all learners have access to digital tools. Madrasah Ibtidaiyah in Pacitan is increasing its digital capacity by improving infrastructure, providing training for teachers, and engaging students effectively and adaptively with technology. The key lies in empowering educators with digital competences, bridging the digital divide, and ensuring that disadvantaged contexts receive the necessary support and resources for educational improvement. By investing in digital literacy, promoting digital equity, and fostering partnerships, education systems can mitigate the adverse impact of the pandemic on learning outcomes and enhance long-term educational gains.

Opportunities exist to leverage technology for equity and inclusion in education (Major et al., 2021). Personalized learning through adaptive platforms can cater to diverse

learning levels, enhancing outcomes significantly (Metatla et al., 2018). Additionally, assistive technologies and inclusive design principles can ensure accessibility for all, including those with specific needs like low vision. Educators play a crucial role in exploring and implementing these tools to create a more inclusive learning environment. By incorporating technology that supports diverse learning styles and provides personalized experiences, educators can address educational challenges and promote equity effectively. This approach aligns with the broader goal of promoting equity, diversity, and inclusion in education through technology.

The integration of technology in education has led to heightened concerns regarding digital safety and privacy, especially in safeguarding students' personal information and online well-being. Educators play a crucial role in prioritizing the security and privacy of student data when incorporating technology into learning environments. Teachers and administrators lack adequate resources to assess privacy and security risks associated with educational technologies, despite the potential threats they pose (Chanenson et al., 2023). Educators consider digital privacy and security within the framework of curricular and classroom management goals, emphasizing the need to integrate these aspects into technology decisions and educational practices. (Kumar et al., 2019) Therefore, teachers in Madrasah Ibtidaiyah express concerns about various digital safety issues, such as inappropriate content access, cyberbullying, and digital footprint, prompting them to take proactive measures like implementing security protocols and providing digital safety education.

In Islamic educational settings, the integration of technology must be approached with cultural sensitivity to align with Islamic values and principles (Mohd Noor et al., 2023). Educators should carefully consider how technology can be utilized in a manner that respects Islamic teachings and cultural norms. Technology in Islamic education serves various functions, including evaluation tools, transmission media, and learning design forums (Astuti et al., 2022). However, challenges such as the need for enhanced technological skills and infrastructure can hinder the effective implementation of technology in teaching Islamic values to young children. Therefore, educators in Madrasah Ibtidaiyah need to navigate these challenges by enhancing their understanding of technology's role in Islamic education and ensuring that its integration is in harmony with Islamic values and cultural sensitivities.

In summary, the integration of technology in Arabic language education presents significant advantages but also poses challenges that educators must navigate for successful implementation. Challenges include barriers to access, concerns about inclusivity, addressing socio-economic gaps, ensuring digital safety and privacy, and maintaining cultural sensitivity (Bhatia et al., 2022). Educators in Madrasah Ibtidaiyah can enhance Arabic language learning outcomes by proactively addressing these challenges. By focusing on improving access to technology, fostering inclusivity, bridging socio-economic disparities, prioritizing digital safety and privacy measures, and upholding cultural sensitivity, educators can optimize the use of technology to benefit all students in their Arabic language learning journey. This comprehensive approach will help create a more effective and equitable learning environment for students engaging with Arabic language education.

Discussion

Student Engagement and Learning Outcomes

The integration of digital literacy and technology in Arabic language education has shown a significant impact on student engagement, motivation, and learning outcomes. Research indicates that digital platforms have become a strategic alternative for sustainable education, especially during the shift to online learning due to the Covid-19 pandemic (Pandita & Kiran, 2023). This integration has led to a positive influence on student satisfaction, with engaged students taking a more active role in their education, leading to higher levels of satisfaction. Additionally, the use of digital platforms has been effective in improving learning outcomes, as evidenced by a meta-analysis showing a small but positive effect size favoring learning via digital platforms over traditional classrooms. The interactive and multimedia-rich nature of digital resources has transformed students' attitudes and behaviors towards learning Arabic, enhancing their overall learning experience and outcomes.

Increased engagement and motivation in Arabic language studies can be attributed to various factors highlighted in the research. Utilizing the question and answer method in learning Arabic has shown a significant increase in student activity, with improvements in asking questions, answering questions, and giving responses. Fostering technology-enhanced science learning has been found to result in higher engagement with science,

emphasizing the importance of seamlessly embedding technology to support learning practices (Li et al., 2022). Game-based learning has been shown to enhance students' motivation, engagement, and academic performance, with students in the game-based group demonstrating improved knowledge and higher motivation compared to traditional methods. These findings collectively suggest that interactive methods, technology integration, and collaborative approaches play crucial roles in enhancing student Madrasah Ibtidaiyah engagement and motivation in learning Arabic language.

The integration of technology in education has led to improved learning outcomes, evident through enhanced language proficiency, critical thinking skills, and cultural awareness. Students benefit from greater fluency in Arabic language skills, showcasing their proficiency in comprehension, analysis, and effective expression in both written and spoken Arabic (Zhang et al., 2023). The utilization of multimedia resources plays a crucial role in providing students with exposure to authentic language contexts, thereby enriching their linguistic competence. The heightened level of student engagement, facilitated by technology integration, contributes significantly to the tangible improvements observed in learning outcomes, emphasizing the positive impact of innovative teaching methods on student academic performance.

Technology-enhanced assessment tools, as discussed in various studies, play a crucial role in providing teachers with the capability to offer timely and precise feedback to students across different language skills. These tools aid in evaluating reading, writing, listening, and speaking abilities, enabling educators to pinpoint both strengths and areas requiring development more efficiently (Gràcia et al., 2023). By utilizing digital platforms for assessment, teachers can customize their teaching strategies to address individual student requirements, ultimately fostering personalized and more impactful learning environments. The integration of technology in assessment processes not only enhances the feedback loop but also contributes to improved student engagement, critical thinking skills, and overall learning outcomes, as evidenced by the findings in the research papers.

Table 3
Student Engagement and Learning Outcomes

Aspect	Student Engagement	Learning Outcomes
Active Participation	Increased involvement in class activities and discussions	Improved retention of language concepts and application skills
Motivation and Interest	Heightened enthusiasm and interest in learning Arabic	Enhanced confidence and satisfaction in language proficiency
Personalized Learning	Tailored learning experiences based on individual preferences	Development of self-directed learning skills and autonomy
Collaborative Learning	Participation in group projects and collaborative activities	Development of teamwork, communication, and critical thinking
Technology Integration	Utilization of digital tools for interactive learning	Acquisition of digital literacy skills and readiness for future

Source: Personal Document

The table showcasing "Student Engagement and Learning Outcomes" in Arabic language education emphasizes the positive impact of technology integration on various aspects. For instance, the Quantum Teaching method significantly enhances students' Arabic proficiency and learning outcomes, fostering a comfortable and interactive learning environment. The use of Information and Communication Technology (ICT) in Arabic language teaching has been instrumental in improving learning quality, despite facing challenges like inadequate infrastructure and teacher technological proficiency (Mohd Rushdi & Asbulah, 2023). Engagement in language learning, particularly in Arabic, is crucial for academic success, with studies highlighting the importance of engagement factors such as skills, emotional connection, and interaction in virtual classrooms. These findings collectively underscore the pivotal role of technology and engagement in promoting positive learning outcomes in Arabic language education.

Integrating Technology for Student Development

The integration of technology into Arabic language education in Madrasah Ibtidaiyah has significantly improved student engagement and learning outcomes. Digital tools, such as e-learning platforms, mobile applications, and AI technologies, have transformed traditional teaching methods into interactive experiences, encouraging greater participation and motivation among students. Students reported positive experiences while learning Arabic through digital games, which provide an engaging and

unique educational environment (Wan Daud, 2024). These platforms have been shown to increase student engagement and access to materials, making learning more personalized and effective (Ahmadi & Saad, 2024).

In the initial stages, students are introduced to user-friendly platforms such as educational apps, multimedia resources, and gamified learning environments tailored for Arabic language acquisition. This early exposure fosters curiosity and motivates students to explore new ways of engaging with the language. For instance, applications for Quranic recitation or vocabulary games provide a playful yet educational start to their learning journey.

During the learning process, students actively engage in collaborative activities, such as virtual discussion groups, online quizzes, and interactive storytelling exercises. These methods not only improve their linguistic proficiency but also enhance critical thinking, teamwork, and digital literacy. The integration of AI-powered tools, like speech recognition for pronunciation practice, further personalizes the learning experience, allowing students to receive immediate feedback and improve at their own pace.

The outcomes of this approach are evident in the students' improved language skills and increased enthusiasm for learning. Many students demonstrate greater fluency in reading, writing, and speaking Arabic, as well as a deeper understanding of Islamic teachings. Moreover, the use of technology has enhanced their digital competence, preparing them for the challenges of the modern, tech-driven world. By combining traditional teachings with innovative technological practices, Madrasah Ibtidaiyah not only achieves its educational goals but also ensures that students are equipped with essential skills for holistic growth in the digital age.

Conclusion

The study in this research examines the transformative potential of integrating digital literacy and technology with traditional Islamic teachings in Arabic language education in Madrasah Ibtidaiyah. The findings emphasize that such integration not only enhances language proficiency but also moral, ethical, and spiritual development among students. Through the use of digital devices and platforms, students are actively engaged in immersive learning experiences, improving their language skills while fostering critical thinking and digital citizenship. This approach is in line with the goal of holistic

educational institutions, blending modern advancements with Islamic values to prepare students for academic and life challenges.

The implementation of the Adab and Tahfidz program, supported by technology, enriches the curriculum by nurturing students' character, discipline, and ethical decision-making. Teachers and students alike benefit from increased accessibility to educational resources, interactive content, and collaborative learning opportunities. Despite challenges such as limited infrastructure and training, the study shows that strategic collaboration between educators, stakeholders, and policymakers can effectively address these issues. Ultimately, the study underscores the importance of a balanced educational framework that integrates technology while maintaining cultural and spiritual integrity, ensuring students are equipped to succeed in a dynamic digital age.

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References

- Ahmadi, A., & Saad, N. M. (2024). Harmony of Tradition and Innovation: A Distinctive Approach for Arabic Language Learning in Madrasah with Adab and Tahfidz Integration. *MUDARRISA: Jurnal Kajian Pendidikan Islam*, 16(1), 102–127. <https://doi.org/10.18326/mudarrisa.v16i1.1077>
- Al-Abdullatif, A. M., & Alsubaie, M. A. (2022). Using Digital Learning Platforms for Teaching Arabic Literacy: A Post-Pandemic Mobile Learning Scenario in Saudi Arabia. *Sustainability*, 14(19), 118–168. <https://doi.org/10.3390/su141911868>
- Al-Daghri, N. M., Amer, O. E., Hameidi, A., Alfawaz, H., Alharbi, M., Khattak, M. N. K., Alnaami, A. M., Aljohani, N. J., Alkhalidi, G., Wani, K., & Sabico, S. (2022). Effects of a 12-Month Hybrid (In-Person + Virtual) Education Program in the Glycemic Status of Arab Youth. *Nutrients*, 14(9), 1–10. <https://doi.org/10.3390/nu14091759>
- Al Sharoufi, H. (2022a). Towards a unified English technology-based writing curriculum in the Arabian Gulf countries: the case of Oman. *Language Testing in Asia*, 12(1), 1–33. <https://doi.org/10.1186/s40468-022-00178-1>
- Al Sharoufi, H. (2022b). Towards a unified English technology-based writing curriculum in the Arabian Gulf countries: the case of Oman. *Language Testing in Asia*, 12(1), 33. <https://doi.org/10.1186/s40468-022-00178-1>
- Alam, G. M., & Forhad, M. A. R. (2023). The Impact of Accessing Education via Smartphone Technology on Education Disparity—A Sustainable Education Perspective. *Sustainability*, 15(14), 10979. <https://doi.org/10.3390/su151410979>
- Allaith, Z. A. (2023). Explicit word-study interventions for adult Arabic-speaking English language learners. *Instructed Second Language Acquisition*, 7(1), 95–117. <https://doi.org/10.1558/isla.23423>
- Almulla, M. A. (2022). Using Digital Technologies for Testing Online Teaching Skills and Competencies during the COVID-19 Pandemic. *Sustainability*, 14(9), 5455. <https://doi.org/10.3390/su14095455>
- Anfuso, C., Awong-Taylor, J., Curry Savage, J., Johnson, C., Leader, T., Pinzon, K., Shepler, B., & Achat-Mendes, C. (2022). Investigating the impact of peer supplemental instruction on underprepared and historically underserved students in introductory STEM courses. *International Journal of STEM Education*, 9(1), 1–17. <https://doi.org/10.1186/s40594-022-00372-w>
- Arseven, I. (2018). The Use of Qualitative Case Studies as an Experiential Teaching Method in the Training of Pre-service Teachers. *International Journal of Higher Education*, 7(1), 111. <https://doi.org/10.5430/ijhe.v7n1p111>
- Asadi, I. A., Kasperski, R., & Bar-Kochva, I. (2022). The relations of SES and literacy-related oral and written language skills after one year of reading instruction – evidence from novice readers of Arabic. *Journal of Child Language*, 1–23. <https://doi.org/10.1017/S0305000922000538>
- Astuti, R., Erni Munastiwi, & Muqowim. (2022). Digital Parenting: Utilizing Technology to Instill Islamic Education Values in Young Children. *TADRIS: Jurnal Pendidikan Islam*, 17(2), 365–379. <https://doi.org/10.19105/tjpi.v17i2.7468>

- Basilotta-Gómez-Pablos, V., Matarranz, M., Casado-Aranda, L.-A., & Otto, A. (2022). Teachers' digital competencies in higher education: a systematic literature review. *International Journal of Educational Technology in Higher Education*, 19(1), 8. <https://doi.org/10.1186/s41239-021-00312-8>
- Bergman, L., Nilsson, U., Dahlberg, K., Jaensson, M., & Wångdahl, J. (2023a). Validity and reliability of the arabic version of the HLS-EU-Q16 and HLS-EU-Q6 questionnaires. *BMC Public Health*, 23(1), 289–304. <https://doi.org/10.1186/s12889-023-15226-5>
- Bergman, L., Nilsson, U., Dahlberg, K., Jaensson, M., & Wångdahl, J. (2023b). Validity and reliability of the arabic version of the HLS-EU-Q16 and HLS-EU-Q6 questionnaires. *BMC Public Health*, 23(1), 304–322. <https://doi.org/10.1186/s12889-023-15226-5>
- Bhatia, S., Devi, A., Alsuwailem, R. I., & Mashat, A. (2022). Convolutional Neural Network Based Real Time Arabic Speech Recognition to Arabic Braille for Hearing and Visually Impaired. *Frontiers in Public Health*, 10. <https://doi.org/10.3389/fpubh.2022.898355>
- Chanenson, J., Sloane, B., Rajan, N., Morril, A., Chee, J., Huang, D. Y., & Chetty, M. (2023). Uncovering Privacy and Security Challenges In K-12 Schools. *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*, 1–28. <https://doi.org/10.1145/3544548.3580777>
- Criollo-C, S., Govea, J., Játiva, W., Pierrottet, J., Guerrero-Arias, A., Jaramillo-Alcázar, Á., & Luján-Mora, S. (2023). Towards the Integration of Emerging Technologies as Support for the Teaching and Learning Model in Higher Education. *Sustainability*, 15(7), 6055. <https://doi.org/10.3390/su15076055>
- Dalimunthe, M. A., Pallathadka, H., Muda, I., Manoharmayum, D. D., Shah, A. H., Prodanova, N. A., Mamarajabov, M. E., & Singer, N. (2023). Challenges of Islamic education in the new era of information and communication technologies. *HTS Teologiese Studies / Theological Studies*, 79(1), 1–6. <https://doi.org/10.4102/hts.v79i1.8608>
- Donges, W. (2015). A Qualitative Case Study: The Lived Educational Experiences of Former Juvenile Delinquents. *The Qualitative Report*, 20(7), 1009–1028. <https://doi.org/10.46743/2160-3715/2015.2189>
- Feng, H. (2020). Digital technologies: Sustainable innovations for improving teaching and learning. *Innovations in Education and Teaching International*, 57(4), 506–508. <https://doi.org/10.1080/14703297.2020.1787740>
- Gràcia, M., Alvarado, J. M., Vega, F., Jarque, M. J., Castillo, P., & Adam-Alcocer, A. L. (2023). A digital tool designed to support secondary education teachers' professional development and to develop students' oral language competence. *Computer Assisted Language Learning*, 1–27. <https://doi.org/10.1080/09588221.2023.2197963>
- Haq, A. Z., Akmansyah, M., Erlina, E., & Koderi, K. (2024). Technology integration in arabic language learning: A literature review on the effectiveness of e-learning and mobile applications. *Journal of Research in Instructional*, 4(2), 481–497. <https://doi.org/10.30862/jri.v4i2.473>

- HEFNER, C. (2022a). Morality, religious authority, and the digital edge. *American Ethnologist*, 49(3), 359–373. <https://doi.org/10.1111/amet.13088>
- HEFNER, C. (2022b). Morality, religious authority, and the digital edge. *American Ethnologist*, 49(3), 359–373. <https://doi.org/10.1111/amet.13088>
- Jain, N. (2021). Survey Versus Interviews: Comparing Data Collection Tools for Exploratory Research. *The Qualitative Report*, 26(2), 541–544. <https://doi.org/10.46743/2160-3715/2021.4492>
- Kabakus, A. K., Bahcekapili, E., & Ayaz, A. (2023). The effect of digital literacy on technology acceptance: An evaluation on administrative staff in higher education. *Journal of Information Science*, 1–12. <https://doi.org/10.1177/01655515231160028>
- Kanygin, G., & Koretckaia, V. (2021). Analytical Coding: Performing Qualitative Data Analysis Based on Programming Principles. *The Qualitative Report*, 26(2), 316–333. <https://doi.org/10.46743/2160-3715/2021.4342>
- Kopec, M., Magnani, M., Ricks, V., Torosyan, R., Basl, J., Miklaucic, N., Muzny, F., Sandler, R., Wilson, C., Wisniewski-Jensen, A., Lundgren, C., Baylon, R., Mills, K., & Wells, M. (2023). The effectiveness of embedded values analysis modules in Computer Science education: An empirical study. *Big Data & Society*, 10(1), 1–13. <https://doi.org/10.1177/20539517231176230>
- Kumar, P. C., Chetty, M., Clegg, T. L., & Vitak, J. (2019). Privacy and Security Considerations For Digital Technology Use in Elementary Schools. *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*, 1–13. <https://doi.org/10.1145/3290605.3300537>
- Li, Q., Jiang, Q., Liang, J.-C., Pan, X., & Zhao, W. (2022). The influence of teaching motivations on student engagement in an online learning environment in China. *Australasian Journal of Educational Technology*, 1–20. <https://doi.org/10.14742/ajet.7280>
- Liu, S., Lu, Y., Wang, D., He, X., Ren, W., Kong, D., & Luo, Y. (2023). Impact of digital health literacy on health-related quality of life in Chinese community-dwelling older adults: the mediating effect of health-promoting lifestyle. *Frontiers in Public Health*, 11, 1–8. <https://doi.org/10.3389/fpubh.2023.1200722>
- Lopez-Varela, E., Abulfathi, A. A., Strydom, N., Goussard, P., van Wyk, A. C., Demers, A. M., Deventer, A. Van, Garcia-Prats, A. J., van der Merwe, J., Zimmerman, M., Carter, C. L., Janson, J., Morrison, J., Reuter, H., Decloedt, E. H., Seddon, J. A., Svensson, E. M., Warren, R., Savic, R. M., ... Hesselting, A. C. (2022). Drug concentration at the site of disease in children with pulmonary tuberculosis. *Journal of Antimicrobial Chemotherapy*, 77(6), 1710–1719. <https://doi.org/10.1093/jac/dkac103>
- Mahfud, C., Rohani, I., Nuryana, Z., Baihaqi, M., & Munawir, M. (2023). Islamic education for disabilities: new model for developing Islamic parenting in Integrated Blind Orphanage of Aisyiyah. *Indonesian Journal of Islam and Muslim Societies*, 13(1), 115–142. <https://doi.org/10.18326/ijims.v13i1.115-142>
- Major, L., Francis, G. A., & Tsapali, M. (2021). The effectiveness of technology-

- supported personalised learning in low- and middle-income countries: A meta-analysis. *British Journal of Educational Technology*, 52(5), 1935–1964. <https://doi.org/10.1111/bjet.13116>
- Masturin, M., Ritonga, M. R., & Amaroh, S. (2022). Tawhid-Based Green Learning in Islamic Higher Education: An Insan Kamil Character Building. *QIJIS (Qudus International Journal of Islamic Studies)*, 10(1), 215. <https://doi.org/10.21043/qijis.v10i1.14124>
- McLarney, E. (2016). Freedom, Justice, And The Power Of Adab. *International Journal of Middle East Studies*, 48(1), 25–46. <https://doi.org/10.1017/S0020743815001452>
- Metatla, O., Serrano, M., Jouffrais, C., Thieme, A., Kane, S., Branham, S., Brulé, É., & Bennett, C. L. (2018). Inclusive Education Technologies. *Extended Abstracts of the 2018 CHI Conference on Human Factors in Computing Systems*, 1–8. <https://doi.org/10.1145/3170427.3170633>
- Mohd Noor, N. E., Tengku Kasim, T. S. A., & Md. Yusoff, Y. (2023). Instilling The Elements Of Good Values And Ethics Through Islamic Education E-Learning Platforms In Primary Schools. *International Journal of Education, Psychology and Counseling*, 8(50), 477–497. <https://doi.org/10.35631/IJEPC.850034>
- Mohd Rushdi, N. A. A., & Asbulah, L. H. (2023). Higher Education Students' Engagement and Factors That Constrain Students' Activeness in Learning Arabic Language. *International Journal of Academic Research in Progressive Education and Development*, 12(2). <https://doi.org/10.6007/IJARPED/v12-i2/17265>
- Nassaji, H. (2015). Qualitative and descriptive research: Data type versus data analysis. *Language Teaching Research*, 19(2), 129–132. <https://doi.org/10.1177/1362168815572747>
- Noordman, J., Roodbeen, R., Gach, L., Schulze, L., Rademakers, J., van den Muijsenbergh, M., Boland, G., & van Dulmen, S. (2022). 'A basic understanding'; evaluation of a blended training programme for healthcare providers in hospital-based palliative care to improve communication with patients with limited health literacy. *BMC Medical Education*, 22(1), 613. <https://doi.org/10.1186/s12909-022-03685-0>
- Osmani, S., & Tartari, D. (2024). The Impact of Digital Technology on Learning and Teaching: A Case Study of Schools in Durrës, Albania. *Journal of Educational and Social Research*, 14(6), 193. <https://doi.org/10.36941/jesr-2024-0165>
- Pandita, A., & Kiran, R. (2023). The Technology Interface and Student Engagement Are Significant Stimuli in Sustainable Student Satisfaction. *Sustainability*, 15(10), 7923. <https://doi.org/10.3390/su15107923>
- Prinsloo, M. (2022). Commentary: Critical digital literacies, practices and contexts. *TESOL Quarterly*, 56(3), 1068–1073. <https://doi.org/10.1002/tesq.3152>
- Sarva, E., Lāma, G., Oļesika, A., Daniela, L., & Rubene, Z. (2023). Development of Education Field Student Digital Competences—Student and Stakeholders' Perspective. *Sustainability*, 15(13), 9895. <https://doi.org/10.3390/su15139895>
- Seer, M., Kampsen, C., Becker, T., Hobert, S., Anders, S., & Raupach, T. (2022). Use of

- digital teaching resources and predictors of medical student performance during the pandemic: A prospective study. *PLOS ONE*, 17(5), 0268331. <https://doi.org/10.1371/journal.pone.0268331>
- Tambak, S., & Sukenti, D. (2020). Strengthening Islamic Behavior And Islamic Psychosocial In Developing Professional Madrasah Teachers. *Jurnal Cakrawala Pendidikan*, 39(1), 65–78. <https://doi.org/10.21831/cp.v39i1.26001>
- Ubaidillah, U., Muflih, M., Fajri, N., Jaili, H., & Azimah, N. (2023). The Importance of Digital Media in Arabic Language Learning; The Use of Canva in Vocabulary Learning. *Jurnal Al-Maqayis*, 10(1), 36–52. <https://doi.org/10.18592/jams.v10i1.8675>
- Vanbecelaere, S., Said-Metwaly, S., Van den Noortgate, W., Reynvoet, B., & Depaepe, F. (2023). The effectiveness of Tier 1 digital interventions for early reading: A meta-analysis. *British Journal of Educational Technology*, 54(5), 1397–1432. <https://doi.org/10.1111/bjet.13351>
- Wan Daud, W. A. A. (2024). Student’s Perceptions Towards Learning Arabic Language Through Digital Game. *Ijaz Arabi Journal of Arabic Learning*, 7(3), 881–892. <https://doi.org/10.18860/ijazarabi.v7i3.27873>
- Wang, Q., & Yu, S. (2024). Investigating the mechanism for automatic generation of online learning resources. *Interactive Learning Environments*, 32(2), 481–501. <https://doi.org/10.1080/10494820.2022.2091605>
- Zakiyah, Z., Shodiq, M. J., & Wijaya, A. (2022). Analysis of Prospective Arabic Teachers’ Technological Pedagogical Content Knowledge (TPACK). *LISANIA: Journal of Arabic Education and Literature*, 6(1), 53–73. <https://doi.org/10.18326/lisania.v6i1.53-73>
- Zeinoun, P., Iliescu, D., & El Hakim, R. (2022). Psychological Tests in Arabic: A Review of Methodological Practices and Recommendations for Future Use. *Neuropsychology Review*, 32(1), 1–19. <https://doi.org/10.1007/s11065-021-09476-6>
- Zhang, Y., Liang, R., Qi, Y., Fu, X., & Zheng, Y. (2023). *Improving Learning Outcomes with Pair Teaching Strategy in Higher Education: A Case Study in C Programming Language* (pp. 157–167). https://doi.org/10.1007/978-981-19-8040-4_12