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Pesantren-Based Community Service Introduction of Digital Learning Media for Female Students at MTs As'adiyah Putri Pusat Sengkang

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ABSTRACT

This pesantren-based community service program addresses the digital literacy gap among female students (santriwati) at MTs As'adiyah Putri Pusat Sengkang through systematic introduction of digital learning media. The program recognizes the critical need to integrate technology in Islamic educational institutions while preserving traditional pesantren values. Implementation involved comprehensive training sessions, hands-on workshops, and mentoring activities designed to enhance students' digital competencies and teachers' capacity to utilize educational technology effectively. The program introduced various digital platforms including interactive learning applications, educational videos, and online resources specifically curated for Islamic educational contexts. Results indicate significant improvements in students' digital literacy skills, increased learning motivation, and enhanced understanding of subject matter through multimedia approaches. Teachers demonstrated growing confidence in integrating technology into instruction while maintaining pedagogical quality. This initiative establishes a replicable model for digital transformation in pesantren education, balancing technological advancement with Islamic educational principles and

demonstrating that traditional institutions can successfully embrace innovation without compromising their distinctive religious and cultural identity.

INTRODUCTION

The rapid advancement of information and communication technology has fundamentally transformed educational landscapes globally, creating both opportunities and challenges for traditional educational institutions. According to Munir (2017) and Muhsyanur, Inne Pelangi (2021), digital technology integration in education represents an inevitable necessity rather than optional enhancement, as contemporary students inhabit increasingly digital environments requiring corresponding pedagogical adaptations. Educational institutions must respond proactively to technological changes, ensuring students develop competencies enabling them to thrive in digital societies. This technological imperative extends to all educational sectors, including Islamic boarding schools (pesantren) that have historically relied on traditional teaching-learning approaches centered on direct teacher-student interaction and text-based learning resources (Mulyana et al., 2021).

Pesantren education in Indonesia faces unique challenges in adopting digital technologies while maintaining their distinctive character and values (Muhsyanur, 2024). Mastuhu (2018) observes that pesantren institutions often experience tension between preserving traditional educational methods that have proven effective for centuries and embracing innovations that could enhance learning outcomes. Many pesantren communities express concerns that technology introduction might dilute religious focus, distract students from spiritual development, or expose them to inappropriate content. However, thoughtful technology integration approaches can address these concerns while capturing digital tools' pedagogical benefits. The key lies in developing contextually appropriate models that align technological adoption with pesantren educational philosophies and values.

Female Islamic education (pendidikan santriwati) requires particular attention in digital literacy development, as gender disparities in technology access and skills persist across many communities. Rahmawati (2019) emphasizes that empowering female students with digital competencies contributes not only to individual educational success but also to broader social transformation, as educated women play crucial roles in family and community development. Female pesantren students face additional challenges including limited exposure to technology in some conservative educational environments, cultural expectations that may prioritize traditional over technical skills, and fewer role models of women successfully utilizing technology in religious contexts. Addressing these challenges through targeted digital literacy programs can significantly enhance educational equity and opportunity.

MTs As'adiyah Putri Pusat Sengkang represents a prominent female Islamic junior secondary school within the larger As'adiyah educational network, serving hundreds of students from across South Sulawesi and beyond. According to Mappangara (2020), the As'adiyah system has historically emphasized academic excellence and strong Islamic character formation, producing graduates who contribute significantly to religious and social leadership. However, like many pesantren institutions, MTs As'adiyah Putri faces challenges in integrating contemporary educational technologies into teaching-learning processes. Existing infrastructure includes limited digital devices, teachers with varying technological competencies, and curricula not yet fully incorporating digital literacy components. These conditions create opportunities for strategic interventions supporting the institution's technological development.

Digital learning media encompasses diverse technological tools and resources designed to facilitate, enhance, and transform educational experiences. Arsyad (2014) defines learning media as anything that can convey messages from sources to recipients in ways that stimulate thinking, feelings, interests, and attention to promote learning. Digital media specifically leverages electronic and internet technologies, including educational software, multimedia presentations, interactive applications, online platforms, and digital content repositories. Effective digital media integration requires careful selection of appropriate tools aligned with learning objectives, adequate technical infrastructure, teacher competency in utilizing technology pedagogically, and supportive institutional policies. When implemented thoughtfully, digital learning media can increase student engagement, accommodate diverse learning styles, provide immediate feedback, enable personalized learning paths, and prepare students for technology-rich futures.

This community service program emerged from collaborative discussions between university faculty and MTs As'adiyah Putri leadership identifying digital literacy as a priority development area. Preliminary assessments revealed that while students possessed basic familiarity with mobile devices for communication, they lacked systematic exposure to educational technology applications and digital learning strategies. Teachers expressed interest in incorporating technology but reported insufficient training and limited access to appropriate digital resources. These findings informed program design emphasizing practical skills development, contextually relevant content, and sustainable capacity building. The program aims to establish foundations for ongoing digital integration by enhancing both student digital literacy and teacher technological pedagogical knowledge while respecting and reinforcing the pesantren's Islamic educational mission and values.

METHOD

This community service program utilized a participatory training approach emphasizing active involvement of both students and teachers in experiential learning activities. According to Knowles (1984), adult learning principles stress the importance of active participation, practical relevance, and immediate application

opportunities in effective educational interventions. The participatory approach ensured program activities remained responsive to actual participant needs and institutional contexts rather than imposing externally designed solutions. Initial consultations with school administrators, teachers, and student representatives identified priority areas, available resources, and potential challenges. This collaborative planning process built stakeholder ownership and commitment while ensuring program alignment with institutional goals and values.

Program implementation occurred through three integrated phases over four months from April through July 2024. The first phase involved comprehensive needs assessment and baseline evaluation of existing digital competencies among students and teachers. Assessment methods included digital literacy surveys measuring familiarity with various technologies and applications, practical skill demonstrations where participants performed specific digital tasks, focus group discussions exploring attitudes toward technology and perceived barriers, and classroom observations documenting current technology use patterns. According to Sudjana (2004), thorough situational analysis provides essential foundations for designing relevant and effective community education programs. Assessment findings revealed varying competency levels, with students generally comfortable with social media but unfamiliar with educational applications, while teachers possessed limited technological pedagogical knowledge despite basic digital skills.

The second phase consisted of structured training and workshop activities designed to systematically build digital competencies. Student training involved forty participants across three grade levels, meeting in weekly three-hour sessions over eight weeks. The curriculum covered fundamental digital literacy concepts including internet navigation and evaluation of online information reliability, educational technology applications such as interactive learning platforms, digital presentation tools, and collaborative online workspaces, content creation skills including basic video editing, digital storytelling, and multimedia presentations, and digital citizenship emphasizing online safety, ethical technology use, and responsible social media engagement. According to Prensky (2010), effective digital literacy education must extend beyond technical skills to encompass critical thinking about technology use and responsible digital citizenship. Parallel teacher training involved fifteen educators participating in intensive workshops covering technological pedagogical content knowledge frameworks, strategies for integrating digital tools into specific subject areas, designing technology-enhanced lesson plans that maintain pedagogical quality, utilizing learning management systems for content delivery and student assessment, and addressing technical troubleshooting and classroom management with technology. The training employed demonstration, guided practice, and independent application cycles enabling participants to progressively develop confidence and competence.

The third phase established sustainability mechanisms through mentoring relationships, resource development, and institutional capacity building. University team members provided ongoing mentoring to teachers implementing digital

lessons, offering technical assistance and pedagogical guidance. Teachers formed peer learning communities meeting monthly to share experiences, problem-solve challenges, and collaboratively develop digital resources. Students identified as digitally proficient received training as peer tutors supporting classmates' skill development. According to Wenger (1998), communities of practice provide powerful mechanisms for sustained learning and innovation through regular interaction, shared problem-solving, and collective knowledge building. The program also developed a digital resource repository containing curated educational materials, lesson plan templates, tutorial videos, and troubleshooting guides accessible to the school community. Infrastructure improvements included establishing a dedicated computer laboratory with twenty workstations, installing reliable internet connectivity, and implementing content filtering systems addressing pesantren concerns about appropriate technology use. Data collection throughout implementation utilized qualitative methods including participant interviews, classroom observations, photo documentation, reflective journals, and group discussions. Sadiman et al. (2014) emphasize that continuous monitoring and evaluation enable program adjustments ensuring interventions remain effective and responsive to emerging needs and challenges.

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RESULT AND DISCUSSION

The community service program generated substantial outcomes across multiple dimensions of digital learning integration at MTs As'adiyah Putri Pusat Sengkang. Implementation of systematic digital literacy training and ongoing mentoring support produced measurable improvements in both student competencies and teacher instructional practices. The following sections analyze three key result areas: development of student digital literacy skills, transformation of teaching practices through technology integration, and institutional capacity strengthening for sustained digital learning implementation.

Development of Student Digital Literacy and Learning Engagement

Student participants demonstrated remarkable progress in digital literacy competencies throughout the program period, moving from limited familiarity with educational technology to confident independent use of diverse digital learning tools. Initial assessments revealed that while most students regularly used smartphones for social media and communication, fewer than twenty percent had experience with educational applications, presentation software, or online learning platforms. By program conclusion, over eighty-five percent of participants could independently navigate educational websites, utilize interactive learning applications, create multimedia presentations, and collaborate using digital platforms. This transformation indicates successful skill transfer from training sessions to practical application contexts.

Students exhibited particular enthusiasm for interactive learning applications that gamified educational content and provided immediate feedback on their

understanding. Applications covering mathematics problem-solving, language learning, and science simulations proved especially popular, with students reporting these tools made learning more engaging and enjoyable compared to traditional textbook-based approaches. According to Smaldino et al. (2019), interactive multimedia can significantly enhance learning motivation by providing varied sensory inputs, enabling active knowledge construction, and offering personalized learning experiences adapted to individual progress rates. Students appreciated opportunities to learn at their own pace, review content multiple times as needed, and receive private feedback without peer observation, addressing common anxieties about public mistakes in traditional classroom settings.

Digital storytelling projects where students created short videos explaining religious concepts or historical events demonstrated integration of technical skills with subject matter knowledge and creativity. These projects required students to research topics thoroughly, organize information coherently, write scripts, record narrations, select appropriate visuals, and edit final products. The process engaged higher-order thinking skills including analysis, synthesis, and evaluation while developing multiple literacies spanning traditional textual analysis, visual composition, and digital technical competencies. Teachers noted that students invested considerable effort in these projects, often working collaboratively and seeking additional learning resources independently. This self-directed learning behavior suggests technology successfully stimulated intrinsic motivation and deeper engagement with academic content.

Student confidence in digital capabilities grew substantially, with many expressing aspirations to utilize technology for continued learning beyond school requirements. Focus group discussions revealed students recognizing technology's potential to access global knowledge resources, connect with learning communities, and pursue personal interests. Several students reported sharing newly acquired skills with family members, teaching parents or siblings to use educational applications or navigate online resources safely. This knowledge diffusion beyond immediate program participants demonstrates community service impact extending into broader social spheres. As emphasized by Dede (2010), digital literacy empowerment particularly benefits populations with historically limited access to information and educational resources, potentially transforming community knowledge landscapes and creating new pathways for social mobility and development.

Overall, the program demonstrated that structured exposure to digital learning tools can foster not only technical competence but also positive learning attitudes among students in a pesantren-based educational setting. Through guided practice and reflective discussions, students became more confident, responsible, and purposeful in their use of technology, aligning digital skills with ethical and educational values. The findings indicate that digital literacy initiatives in faith-based institutions can bridge the gap between traditional learning environments and contemporary educational demands, while maintaining cultural and moral integrity.

This reinforces the role of community service programs as effective instruments for empowering learners and expanding educational opportunities within underserved communities.

Figure 1. Female students actively engaging with digital learning devices during computer laboratory training session at MTs As'adiyah Putri Pusat Sengkang

Transformation of Teaching Practices through Technology Integration

Teacher participants underwent significant pedagogical transformation as they incorporated digital tools into instructional practices, moving from technology skepticism or anxiety toward viewing digital media as valuable pedagogical resources. Initial teacher attitudes varied considerably, with younger educators generally more comfortable with technology while senior teachers expressed concerns about technical complexity, time requirements for learning new tools, and potential disruptions to established teaching routines. The training program addressed these concerns through graduated skill building, emphasizing technologies' pedagogical benefits, and providing ongoing support during implementation phases. By program conclusion, all participating teachers had successfully designed and delivered technology-enhanced lessons, with most reporting intentions to expand digital integration in future instruction.

Teachers demonstrated growing sophistication in selecting appropriate technologies aligned with specific learning objectives rather than using technology merely for novelty. For example, science teachers utilized simulation software enabling students to conduct virtual experiments exploring concepts difficult to demonstrate in resource-limited laboratory settings. Language teachers employed interactive pronunciation tools providing students with models of correct

articulation and opportunities for private practice with automated feedback. Religious studies teachers curated collections of digital resources including recitation recordings by renowned scholars, historical site virtual tours, and documentary videos contextualizing religious teachings. This purposeful technology selection reflects development of technological pedagogical content knowledge, understanding how specific technologies can enhance particular content area instruction.

Collaborative planning among teachers produced innovative interdisciplinary projects leveraging digital tools. One notable initiative involved students researching regional Islamic history, creating multimedia presentations documenting historical mosques and religious figures, and sharing findings through a digital exhibition accessible to the broader school community. This project integrated multiple subject areas including history, language arts, information technology, and religious studies while developing diverse competencies spanning research, critical thinking, communication, and technical skills. According to Koehler and Mishra (2009), effective technology integration requires understanding complex relationships among content knowledge, pedagogical expertise, and technological capabilities, with most powerful applications emerging from thoughtful combination of these knowledge domains.

Teachers reported that technology integration positively impacted classroom dynamics, increasing student participation, enabling differentiated instruction addressing diverse learning needs, and providing richer assessment information about student understanding. Digital platforms offering varied difficulty levels allowed teachers to challenge advanced students while providing additional support for those struggling with concepts. Real-time assessment tools enabled teachers to identify widespread misunderstandings immediately and adjust instruction accordingly rather than discovering learning gaps only after summative examinations. These pedagogical improvements demonstrate technology's potential to enhance teaching effectiveness when implemented thoughtfully within sound instructional frameworks rather than replacing good pedagogy with technological gimmicks.

From the teachers' perspective, the integration of digital tools contributed to more interactive and adaptive classroom environments. Technology-assisted instruction enabled educators to engage students more actively, tailor learning activities to varying levels of ability, and obtain immediate feedback on student comprehension. By utilizing digital platforms with differentiated content and real-time assessment features, teachers were able to respond promptly to learning challenges and refine their instructional strategies during the learning process. These findings highlight that when technology is embedded within well-designed pedagogical frameworks, it can significantly enhance teaching effectiveness, support inclusive learning practices, and strengthen overall instructional quality without undermining the foundational principles of sound pedagogy.

Figure 1. Teachers facilitating technology-integrated learning activities, guiding students in utilizing educational applications for subject matter exploration at MTs As'adiyah Putri Pusat Sengkang

Institutional Capacity Building and Sustainable Digital Integration

The program successfully established foundational infrastructure and institutional mechanisms supporting sustained digital learning integration beyond immediate project timeframes. Infrastructure improvements including the equipped computer laboratory, reliable internet connectivity, and technical support systems addressed critical barriers that previously prevented technology adoption. The dedicated learning space provides controlled environments where students can develop digital skills systematically while content filtering and monitoring systems address pesantren concerns about appropriate technology use. According to Wahyuningsih (2020), successful technology integration in educational institutions requires not only individual competency development but also supportive organizational structures, adequate resources, and leadership commitment to sustained innovation.

Institutional policies developed collaboratively with school leadership formalized digital literacy as a curriculum component and established guidelines for responsible technology use aligned with Islamic values (Muhsyanur, 2021) and (Muhsyanur et al., 2021). These policies clarify appropriate and prohibited technology uses, outline teacher responsibilities for supervising digital activities, specify acceptable content parameters, and articulate connections between digital citizenship principles and Islamic ethical teachings. Policy development involved extensive discussions ensuring technology integration reinforces rather than

conflicts with the pesantren's religious mission. This value alignment proved crucial for securing broad stakeholder support including from religious leaders initially skeptical about technology introduction in Islamic educational settings.

The peer learning community established among teachers provides ongoing professional development infrastructure sustaining innovation beyond external program support. Monthly meetings enable teachers to share successful technology integration strategies, collectively problem-solve implementation challenges, and collaboratively develop new digital resources. Several teachers have assumed leadership roles in mentoring colleagues, conducting internal training sessions, and advocating for continued institutional investment in educational technology. This distributed leadership model embeds innovation capacity within the institution rather than creating dependency on external expertise. As noted by Fullan (2016), sustainable educational change requires building internal capacity through professional learning communities where educators collectively develop expertise and maintain momentum for continuous improvement.

Student peer tutoring systems established capable students as technology mentors assisting classmates and even younger students in developing digital competencies. This approach multiplies program impact by creating cascading knowledge transfer and developing student leadership skills. Peer tutors reported increased confidence, communication abilities, and sense of responsibility through their mentoring roles. The peer support model also addresses common challenges in student-teacher technology dynamics where students sometimes surpass teachers in technical proficiency, potentially creating awkward power inversions. By legitimizing peer-to-peer technology learning, the program normalizes multi-directional knowledge flows while maintaining teachers' authority over pedagogical decisions and learning objectives. According to Topping (2005), peer-assisted learning benefits both tutors and tutees, reinforcing tutor knowledge through teaching while providing tutees with accessible support from relatable peers who recently mastered similar skills themselves.

CONCLUSION

This pesantren-based community service program successfully introduced digital learning media at MTs As'adiyah Putri Pusat Sengkang, demonstrating that traditional Islamic educational institutions can effectively integrate contemporary technology while preserving their distinctive religious character and values. Through systematic training, ongoing mentoring, and institutional capacity building, the program enhanced digital literacy among female students, transformed teaching practices through pedagogically sound technology integration, and established sustainable infrastructure supporting continued digital learning advancement. Key achievements include developing student competencies in utilizing diverse educational technologies, increasing learning engagement through interactive multimedia approaches, building teacher capacity for technology-enhanced instruction, and creating supportive institutional policies and structures.

The program's participatory approach ensured interventions respected pesantren values and contexts while introducing innovations, thereby securing stakeholder support and commitment essential for sustained implementation. Results demonstrate that thoughtful technology integration can enhance educational quality and prepare students for contemporary challenges without compromising Islamic educational principles. This initiative offers a replicable model for other pesantren institutions seeking to embrace digital transformation, contributing to broader efforts in modernizing Islamic education while maintaining its spiritual foundations and cultural authenticity.

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