



Mapping Digital Content Needs Among Midwifery Students in Indonesia

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Abstract

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Modern midwifery education demands that educators integrate technology to enhance student competency. As digital natives, midwifery students possess significant potential to leverage mobile applications. However, the specific usage patterns and the gap between available applications and priority clinical needs in Indonesia remain unmapped. Objective: This study aims to identify smartphone usage patterns and map priority digital learning material needs among midwifery students to inform curriculum enhancement. Methods: Utilizing a cross-sectional descriptive quantitative design, an online survey was conducted with 182 midwifery students in Bandung Raya, selected via convenience sampling. The instrument, evaluated for validity and reliability, measured demographics, device usage, and priority learning needs. Data were analyzed using descriptive frequency statistics. Results: All respondents (100%) owned smartphones, with 76.92% actively using them for learning, primarily favoring e-learning applications (80.22%). Crucially, the study identified a significant demand for digital content focused on patient communication (76.37%) and pregnancy care (27.47%), revealing a clear gap between students' high technological readiness and the availability of targeted clinical modules. Conclusion: Smartphones are essential, yet their specific clinical potential remains underutilized. To enhance the midwifery curriculum, institutions must employ established instructional design frameworks to develop targeted, interactive digital learning modules that directly address the identified high-priority clinical skills, thereby bridging the gap between digital readiness and professional competency.

Keywords:

Midwifery Education; Mobile Learning; mHealth; Needs Analysis; Digital Learning Readiness

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INTRODUCTION

The quality of midwifery education is recognized as a critical component in global efforts to reduce maternal and infant mortality rates, directly contributing to the achievement of the Sustainable Development Goals (SDGs) (Spelten et al., 2023). Ideally, based on the digital competency frameworks established by the World Health Organization (WHO) and the Indonesian Ministry of Education, Culture, Research, and Technology (Permendikbudristek), modern healthcare curricula must seamlessly integrate digital health literacy to prepare students for technology-driven healthcare environments. Contemporary midwifery services are transitioning to the Continuity of Care (CoC) model, in which midwives provide seamless care throughout pregnancy, childbirth, and the postpartum period. This model significantly improves clinical outcomes and maternal satisfaction (Mutiah et al., 2024). Consequently, curricula must move beyond simple clinical skill training to incorporate the competencies needed to manage complex care within evolving health systems (Ndayisenga et al., 2021).

Technological advancements have played a vital role in redesigning the modern education system to be more adaptive, effective, and inclusive. Generation Z, the primary demographic of midwifery students, are digital natives who rely on smartphones not just for communication, but as integral tools for their academic and clinical training. Smartphones provide immediate access to medical knowledge and care protocols, creating an opportunity to bridge theoretical concepts with practical applications (Islam et al., 2022; Lopez-Gazpio, 2023).

However, the factual conditions in the field reveal a stark contrast to these ideal standards. Despite rapid development, many educational institutions are still struggling to align with 21st-century competencies because of outdated pedagogical models (Díaz et al., 2022; Rahimi & Oh, 2024; Soghomonyan & Karapetyan, 2023). Even with widespread smartphone ownership, significant barriers impede the successful integration of these devices into the Indonesian midwifery educational framework. Students struggle with manual care documentation, which is often cumbersome and prone to data loss, thereby adversely affecting their learning experiences (Dewi et al., 2024; Oktavian, 2024; Susilawati et al., 2025).. Furthermore, Mapulanga et al. (2024) warn that while students frequently engage in independent online research, they often rely on questionable sources that diverge from curricular standards and fail to address critical clinical needs (Mapulanga et al., 2024).

This creates a critical research gap. While international literature highlights the benefits of educational technology, empirical data detailing how Indonesian midwifery students use mobile applications for clinical learning remain severely limited. Mayra et al. (2021) and Rukiyah et al. (2022) indicate that a lack of data on how Indonesian midwifery students use their devices and the critical learning needs they identify exacerbates the gap between ownership and effective utilization (Mayra et al., 2021; Rukiyah et al., 2022). To address this gap and design effective digital curricula, a quantitative descriptive survey is urgently needed as a methodological solution to establish solid, baseline empirical data regarding student behaviors and specific content needs.

Addressing this critical gap in the literature, this study represents the first empirical effort to specifically map the intersection of smartphone usage patterns and priority clinical content needs among midwifery students in the Indonesian context, thereby providing a novel, data-driven foundation for enhancing mobile learning (mHealth) curricula. Therefore, this study aims to answer the following research questions: What are the specific smartphone and mobile application usage patterns among midwifery students in the Bandung Raya region? What are the highest priority digital learning material needs identified by these students to support their clinical competencies? Consequently, the research objectives of this study are formulated as follows: To identify the frequency, types, and preferences of mobile application usage among midwifery students; To map and categorize the priority digital learning materials required to enhance their clinical and communication skills, serving as a basis for future educational technology development.

METHODS

Research Design

This study adopted a quantitative cross-sectional descriptive design. This approach was selected as the most efficient and appropriate method to capture a broad, real-time snapshot of current digital technology usage patterns and establish a foundational baseline of clinical learning needs across multiple institutions.

Participants and Data Collection

The study population comprised midwifery students enrolled in institutions within the Bandung Raya area. Using a convenience sampling technique, data were collected from 182 active students across various program levels (Professional, Bachelor's and Professional, and Diploma 4). While the convenience sampling method may limit the broader generalizability of the findings, the sample size of 182 was deemed sufficient to conduct an exploratory baseline needs analysis within this specific regional context.

The inclusion criteria were active enrollment in a midwifery program and the provision of informed consent. The exclusion criteria included students who were currently on academic leave or those who submitted incomplete survey responses. Data collection was conducted over a four-week period using Google Forms. The survey was administered directly on-site to the students rather than through digital communication groups. This direct, in-person administration approach optimized student participation, resulting in a final response rate of 100%.

Research Instrument

The instrument was a structured self-administered online questionnaire consisting of four sections: 1) Demographics; 2) Device Ownership and Usage Frequency; 3) Application Types and Preferences; and 4) Priority Learning Material Needs (measured using a dichotomous choice/checkbox list). The questionnaire was specifically developed for this study through an extensive literature review and subsequent in-depth discussions among the research team to

ensure strict alignment with the local midwifery clinical curriculum (O’connor & Andrews, 2018).

To establish the instrument's appropriateness, content validity was achieved through expert consensus within the research team, ensuring all items accurately reflected the factual usage patterns and specific learning needs of the students. Because the questionnaire primarily collected categorical and factual data (e.g., types of devices, a checklist of preferred apps, and dichotomous choices for priority learning needs) rather than measuring a latent psychological construct via continuous psychometric scales, calculating a traditional reliability coefficient was not statistically applicable. Instead, the reliability and consistency of the instrument were ensured by using clear, unambiguous clinical terminology familiar to the students and conducting a rigorous internal peer review of the questions prior to distribution.

Data Analysis

The survey data were analyzed using Stata SE 17. Descriptive statistics, including frequencies and percentages, were calculated to summarize demographics, device usage, and priority needs. Furthermore, to provide deeper analytical insights and address the limitations of purely descriptive data, cross-tabulation analysis was conducted to explore the distribution of priority learning needs across different academic levels and semesters.

Ethical Approval

Ethical clearance was obtained from Hasanuddin University, under the recommendation number 929/UN4.14.1/TP.01.02/2025 with Protocol No. 21525105012.

RESULTS & DISCUSSION

The findings from the descriptive statistical analysis are presented below, detailing participant characteristics, mobile application usage patterns, and priority learning needs.

Table 1. Characteristics of Midwifery Students

Characteristic	Bandung Raya (n=182)
Age	
17-25 years (Late Adolescence)	159 (87.36)
26-35 years (Early Adulthood)	4 (2.20)
36-45 years (Late Adulthood)	11 (6.04)
46-55 years (Early Elderly)	6 (3.30)
56-65 years (Late Elderly)	2 (1.10)
Education Level	
D3 Midwifery	0
Profession	80 (43.96)
S1 + Profession	66 (36.26)
D4 + Profession	36 (19.78)
Semester	

Semester 1	36 (19.78)
Semester 2	25 (13.74)
Semester 3	28 (15.38)
Semester 6	77 (42.31)
Semester 8	16 (8.79)

Table 1 shows that the majority of students (87.36%) fall into the 17–25 year age group (late adolescence), confirming that they are digital natives. The Profession program is the largest group of respondents (43.96%), with the largest cohort in Semester 6 (42.31%).

Table 2. Device Usage and Mobile Application Types

Variables	n	%
Smartphone Ownership	182	100,00
Application Use for Learning	140	76,92
Frequency of Application Usage		
Often	93	51,10
Sometimes	81	44,51
Seldom	8	4,40
Most Frequently Used Application Types		
E-learning applications	146	80,22
Calculator (medical, pregnancy)	97	53,30
Communication applications (chatbots, groups)	83	45,60
Clinical skills guide	74	40,66
Medical dictionary	52	28,57

Table 2 confirms that 100% of surveyed students own a smartphone, and 76.92% use mobile applications specifically for learning purposes. Over half (51.10%) use these applications often. E-learning applications are the most popular type, utilized by 80.22% of students.

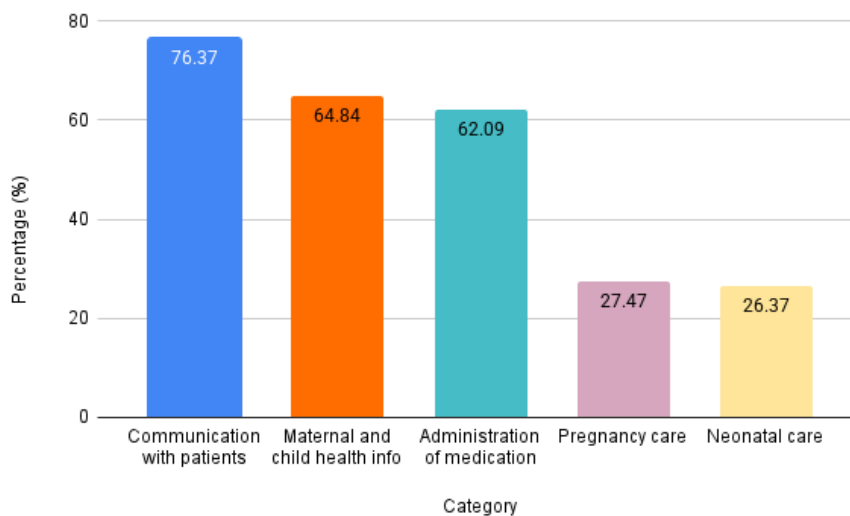


Figure 1. Priority Digital Learning Material Needs Identified by Midwifery Students

Figure 1 outlines the specific learning materials prioritized by the respondents, highlighting a strong demand for competencies related to communication and health information management. Communication with patients emerged as the most critical need, selected by the majority of students (76.37%). This indicates that as students transition into clinical settings, their primary challenge shifts from basic clinical procedures to complex interpersonal interactions and medication management, which must be addressed in future curriculum enhancements.

Table 3. Perceived Usefulness of Information Sources for Midwifery Learning

Resources	Most useful n (%)	Very useful n (%)	Quite useful n (%)	Somewhat useful n (%)
Clinical Instructor (CI)	52 (28.57)	111 (60.99)	18 (9.89)	1 (0.55)
Interprofessional Friends	55 (30.22)	105 (57.69)	22 (12.09)	0 (0.00)
Mobile application	53 (29.12)	102 (56.04)	27 (14.84)	0 (0.00)
Preceptor	55 (30.22)	102 (56.04)	24 (13.19)	1 (0.55)
Online journal	76 (41.76)	91 (50.00)	15 (8.24)	0 (0.00)
Health workers	87 (47.80)	87 (47.80)	8 (4.40)	0 (0.00)
E-book	76 (41.76)	87 (47.80)	19 (10.44)	0 (0.00)

Table 3. illustrates that midwifery students utilize a blended approach to clinical learning, valuing both human mentorship and digital resources. Health workers emerged as the most critical resource, with a combined 95.6% of students rating them as "most" or "very" useful for their education. Digital academic tools also ranked prominently, as online journals (91.76%) and e-books (89.56%) were considered essential for acquiring theoretical knowledge. While mobile applications were widely appreciated (85.16%), their perceived utility was comparable to that of clinical instructors and preceptors, suggesting they serve as complementary support tools rather than replacements. Overall, the findings indicate that students successfully integrate modern technology to support, rather than supplant, traditional professional guidance in clinical settings.

Table 4. Cross-Tabulation of Education Level and Top Priority Learning Needs

Education Level	Communication with Patients n (%)	Administration of Medication n (%)	Pregnancy Care n (%)
Profession (n=80)	61 (76.25%)	47 (58.75%)	26 (32.50%)
S1 + Profession (n=66)	52 (78.79%)	37 (56.06%)	19 (28.79%)
D-IV + Profession (n=36)	26 (72.22%)	29 (80.56%)	5 (13.89%)

To provide deeper insights for curriculum enhancement, a cross-tabulation analysis was conducted to examine how learning needs differ across educational levels (Table 4). The analysis reveals that the demand for digital modules focused on *Communication with Patients* is consistently high across all levels, peaking among students in the S1 + Profession program (78.79%). Interestingly, the need for *Administration of Medication* is particularly pronounced among D-IV + Profession students (80.56%). Conversely, fundamental clinical skills such as *Pregnancy Care* are prioritized differently depending on the students' academic

progression. These cross-tabulated findings provide concrete evidence that a "one-size-fits-all" approach to digital curriculum development is insufficient. Instead, educational institutions must design targeted, progressive mHealth modules that adapt to the evolving clinical complexities students face at different stages of their education.

Discussion

Our findings indicate that 100% of midwifery students own a smartphone, with a substantial majority (76.92%) actively using them for learning purposes. This high level of digital readiness aligns with the core principles of the Technology Acceptance Model (TAM), which posits that user acceptance of technology is driven by Perceived Usefulness and Perceived Ease of Use (Ibrahim & Shiring, 2022; Toros et al., 2024). Students overwhelmingly favored e-learning applications (80.22%), suggesting these platforms successfully meet the criteria of accessibility and high relevance, a trend supported by recent literature characterizing mobile learning as a crucial educational modality (Alturki & Aldraiweesh, 2022; Wen et al., 2020). However, a critical analysis of the data reveals that ubiquitous device ownership does not automatically translate into effective clinical learning. While mobile technology increases learners' general interest and interaction (Naveed et al., 2023; Qiao et al., 2024), the gap between universal smartphone ownership (100%) and targeted educational use (76.92%) underscores that passive device access is insufficient without intentionally designed instructional media.

Furthermore, the study reveals a significant gap in the specific digital content available to students, contradicting the traditional expectation that junior healthcare students primarily need basic procedural guides. The needs analysis demonstrated a critical demand for soft-skill and complex management modules, notably Communication with Patients (76.37%) and Administration of Medication (62.09%), over foundational clinical procedures like Pregnancy Care (27.47%). As students transition into clinical practice and the Continuity of Care (CoC) model, their primary challenges shift toward interpersonal communication and precise medication safety. Currently, many existing mHealth applications focus heavily on maternal data tracking rather than interactive, student-centered clinical problem-solving. This necessitates targeted curriculum adjustments informed by specific student demands. Studies confirm that conducting a thorough needs analysis is a vital precursor to the successful development of innovative learning media, essential for improving student competencies like critical thinking (Aprilia et al., 2024; Asmi et al., 2025; Rahayu & Nugroho, 2025).

From an Educational Technology perspective, these findings indicate a pressing need for curriculum redesign. Educators and instructional designers must pivot from simply providing digitized textbooks to developing interactive digital modules based on robust frameworks, such as the Mobile Learning Framework and the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) model. By embedding clinical decision-making scenarios and simulated patient communication exercises directly into mobile applications, institutions can bridge the gap between high smartphone usage and targeted clinical competency

enhancement (Ton et al., 2024). While e-learning offers flexibility in location, time, and pace to accommodate diverse student needs, strong student-instructor interaction remains crucial for success (Aguilera-Hermida, 2020). Therefore, developing training resources that utilize digital simulations and experiential learning is essential to improving care delivery (Stierman et al., 2024).

Despite the widespread adoption of technology, the survey showed that students still highly value traditional sources of information, with healthcare workers deemed the most useful source of clinical guidance (47.80%). This emphasizes the role of clinical mentorship alongside digital tools. Students view mobile technology as a powerful complementary tool, not a replacement for face-to-face mentorship. They highly value personal guidance from experienced practitioners, underscoring the importance of interpersonal communication in clinical learning (Brobby et al., 2024). Smartphones serve as a bridge to access credible resources such as online journals and e-books (both rated "most useful" by 41.76% of respondents), which can then be discussed and explored with clinical mentors (Panackal et al., 2023; Zhou, 2023). Consequently, future application designs should incorporate expert-verified content or telehealth mentoring features to ensure clinical credibility. The challenge for educators is to integrate these new technologies to enrich learning while intentionally preserving the vital interpersonal relationships that students value.

Limitations

This study has several limitations that should be acknowledged. First, the use of a convenience sampling technique may introduce selection bias, meaning the sample might not be perfectly representative of the entire student population. Second, the geographical scope is limited to midwifery institutions in the Bandung Raya region. Consequently, the findings may have limited generalizability to midwifery students in other regions of Indonesia, particularly those in rural areas with different technological infrastructures. Future research should employ stratified random sampling across diverse provinces to yield more comprehensive, nationally representative data.

CONCLUSION

This study set out to identify smartphone usage patterns and to map priority needs for digital learning materials among midwifery students to inform future curriculum enhancements. Based on the findings, the conclusions are synthesized into two main points directly addressing the research objectives.

Midwifery students exhibit exceptionally high digital readiness. Smartphones and e-learning applications have become ubiquitous and integral tools for their academic pursuits. Their extensive engagement with these devices is driven by the platforms' accessibility and perceived usefulness in obtaining immediate clinical information.

There is a critical, unmet demand for digital content focusing on advanced clinical soft skills and complex management. As students prepare for the Continuity of Care (CoC) model, their priorities shift away from foundational procedural

guides toward interactive modules centered on patient communication and medication administration.

These findings carry specific implications for the evolution of the midwifery curriculum. Educational institutions and instructional designers must move beyond the simple digitization of textbooks. There is significant potential to develop interactive, mobile-based clinical learning systems that embed decision-making scenarios and simulated communication exercises. Crucially, these digital tools must be intentionally designed to complement, rather than replace, the traditional face-to-face clinical mentorship that students still highly value.

Directions Moving beyond exploratory descriptive surveys, future research must transition into the development and implementation phases. It is highly recommended that researchers utilize established instructional design frameworks (such as the ADDIE model) to prototype the high-priority mHealth modules identified in this study. Subsequent experimental research should then be conducted to evaluate the actual effectiveness of these targeted digital modules on improving students' clinical competencies and engagement in real-world settings.

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