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Impact of Mobile Technology Use on Knowledge Management in the Education Sector

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ABSTRACT

The integration of mobile technology into knowledge management (KM) practices has reshaped the landscape of information sharing and learning in the education sector. This study explores how mobile devices and applications contribute to the efficiency, accessibility, and effectiveness of KM processes among educators, students, and administrators. With the growing adoption of smartphones, tablets, and mobile learning platforms, educational institutions are experiencing a shift from traditional knowledge repositories to dynamic, real-time knowledge exchange environments. The research employs a mixed-method approach involving surveys and in-depth interviews with teachers, students, and IT staff across several secondary and higher education institutions. The findings reveal that mobile technology enhances knowledge acquisition and dissemination by enabling anytime-anywhere access to learning materials, collaborative tools, and institutional knowledge databases. However, challenges such as data security, digital literacy gaps, and resistance to change remain significant barriers to optimal utilization. Furthermore, the study highlights the role of institutional policies and support systems in facilitating effective mobile-based KM adoption. The results indicate that institutions with clear mobile technology strategies and investments in user training are more likely to achieve improved knowledge-sharing outcomes. This research provides practical insights into leveraging mobile technology to strengthen KM frameworks in education and emphasizes the need for continuous adaptation to technological advancements to sustain knowledge-based performance improvements.

Keywords:

Mobile Technology, Knowledge Management, Education Sector, Knowledge Sharing, Digital Learning

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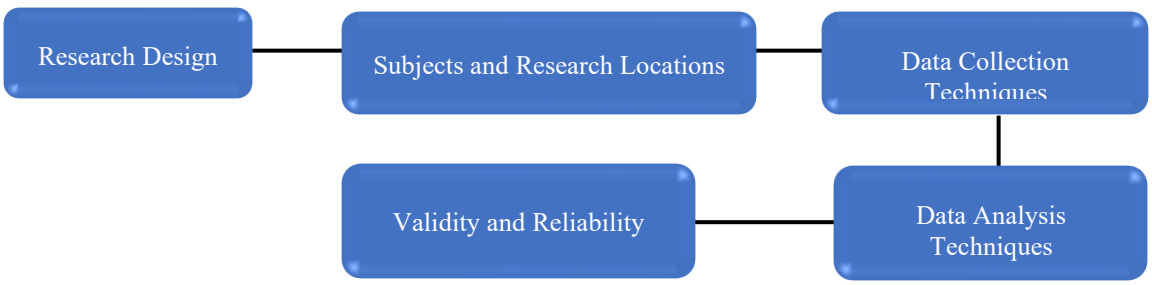
1. INTRODUCTION

The development of information and communication technology (ICT) has brought significant transformations in various sectors, including the education sector. One of the most prominent innovations is the adoption of mobile technology, which has changed the way individuals access, manage, and share information. Mobile technology which includes devices such as smartphones, tablets, and mobile-based applications provides unprecedented flexibility, portability, and connectivity[1]. In the context of education, the presence of mobile technology not only impacts the teaching and learning process but also plays an important role in knowledge management (KM)[2]. Knowledge management is a systematic approach to capturing, organizing, sharing, and analyzing knowledge to achieve organizational goals[3]. In an educational environment, KM involves the processes of documenting, distributing, and developing knowledge related to learning materials, teaching practices, academic policies, and pedagogical innovations[4]. However, the main challenges of implementing KM in the education sector often lie in the limited access to real-time knowledge, the isolation of knowledge resources, and the lack of user engagement in knowledge sharing. This is where the role of mobile technology becomes highly relevant. Mobile technology supports the KM process by providing the ability to access and update information instantly from anywhere and anytime[5]. Mobile learning applications, cloud-based platforms, and instant messaging communication have become the main media for connecting educators, learners, and other stakeholders in the education ecosystem[6]. For example, teachers can share learning modules through mobile-based applications like Google Classroom, while students can collaborate in digital discussion forums[7]. Similarly, administrators can use mobile-based management systems to distribute academic policies and track the effectiveness of learning[8]. The adoption of mobile technology in the context of KM offers several advantages[9]. First, this technology enhances the efficiency of knowledge management by automating the information distribution process[10]. Second, mobile technology expands user participation by facilitating faster and more responsive two-way communication[11]. Third, this technology has the potential to reduce reliance on physical infrastructure such as computer labs or meeting rooms, thereby enabling more flexible and adaptive learning and management models[12]. However, behind these opportunities, there are also challenges that need to be addressed, such as data security issues, the digital literacy gap among users, and institutional budget constraints for technology investment[13].

In the context of education in Indonesia, the use of mobile technology is increasingly developing along with the rising penetration of the internet and the ownership of mobile devices among the public[14]. A report from the Indonesian Internet Service Providers Association (APJII) shows that the majority of internet users in Indonesia access information through mobile devices[15]. This condition presents a strategic opportunity for educational institutions to optimize KM through a mobile approach. However, there is still an implementation gap between institutions with infrastructure and human resource readiness and those with limited resources. Therefore, analyzing the real impact of mobile technology usage in knowledge management practices in the education sector becomes an important task to undertake. This research aims to deeply analyze how the use of mobile technology affects the effectiveness of knowledge management processes in educational environments. The main focus lies on three aspects: (1) the contribution of mobile technology to the acquisition and dissemination of knowledge; (2) the challenges faced in the implementation of mobile-based KM; and (3) the role of institutional policies in supporting the use of mobile technology. This research employs a mixed-method approach that combines quantitative data through surveys and qualitative data from in-depth interviews with educators, students, and administrative staff from several secondary and higher education institutions. By understanding the dynamics of mobile technology usage in the context of KM, it is hoped that the results of this research can contribute to the development of technology-based education policies, as well as serve as a foundation for planning more inclusive and sustainable digital strategies. Furthermore, this study also aims to strengthen both theoretical and practical understanding of the integration of ICT in the transformation of knowledge management in the education sector, particularly in the face of global demands for efficiency, collaboration, and innovation in the administration of education in the digital era.

2. RESEARCH METHODOLOGY

This research uses a mixed-method approach to obtain a comprehensive picture of how mobile technology is used in knowledge management in the education sector. This approach includes a combination of quantitative and qualitative methods, aiming to obtain data that is not only statistical but also contextual and descriptive.



Picture 1. Systematic Frame

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2.1 Research Design

This research adopts an exploratory-descriptive design. The exploratory approach is used to understand the extent of mobile technology utilization in the knowledge management process within educational institutions, while the descriptive approach is used to describe the impacts, benefits, and obstacles encountered in the implementation.

2.2 Subjects and Research Locations

The population in this study includes three main categories of mobile technology users in the context of education:

a. Educator (teacher/lecturer),
b. Students (school/university),
c. Academic administration staff.

The research locations were conducted in four educational institutions (two high schools and two universities) in urban and semi-urban areas in Indonesia that have implemented mobile technology in teaching and learning activities and academic information management.

2.3 Data Collection Techniques

Data was collected through four main techniques:

a. Questionnaire (Quantitative Survey): Distributed to 120 respondents consisting of teachers/lecturers, students, and administrative staff. This survey evaluates the frequency of mobile technology usage, the types of applications used, and their perceptions of the impact of mobile technology on KM effectiveness.
b. In-Depth Interviews (Qualitative): Conducted with 15 key informants from each user category. This interview aims to delve into insights about the challenges, habits, and personal experiences in using mobile technology to share and access knowledge.
c. Field Observation: The researcher conducted direct observations of mobile-based learning activities and the use of knowledge management applications at the institution being studied.
d. Documentation Study: Reviewing internal policies, digital learning activity reports, and documents on the use of the mobile-based Learning Management System (LMS) owned by the institution.

2.4 Data Analysis Techniques

a. Quantitative data were analyzed using descriptive and correlational statistical techniques with the aid of SPSS software to identify trends and relationships between mobile technology usage variables and KM effectiveness.
b. Qualitative data is analyzed using thematic coding techniques to identify narrative patterns and main themes that emerge from interviews and observations.

2.5. Validity and Reliability

To ensure the validity and reliability of the data, method triangulation was conducted, which involved comparing the results from surveys, interviews, and observations. In addition, the questionnaire instrument was validated through construct validity and reliability tests (Cronbach Alpha test with a result of ≥ 0.7).

3. RESULT AND DISCUSSION

This section presents the main findings of the research related to the use of mobile technology in knowledge management in the education sector. The results are compiled based on quantitative and qualitative data, which are then analyzed to observe usage patterns, perceived benefits, and challenges faced by users. Discussions were conducted to assess the extent to which mobile technology supports the processes of sharing, accessing, and managing knowledge within the context of educational institutions.

3.1 Overview of Respondents

A total of 120 respondents participated in a quantitative survey conducted at four educational institutions two high schools and two universities that have implemented mobile technology in learning activities and knowledge management. Of the total respondents, 40% were educators (teachers/lecturers), 50% were learners (students/university students), and 10% were academic administrative staff. This composition was chosen to provide proportional representation of the three main actor groups in the education system who are directly involved in the knowledge management cycle (knowledge acquisition, sharing, and retention).

From the perspective of the devices used, 93% of respondents access materials and knowledge management systems using smartphones, 31% also use tablets, and around 18% use laptops in a mobile context (mobile hotspot or mobile applications). The majority use applications such as Google Classroom, Moodle Mobile, WhatsApp Group, Telegram Channel, and Google Drive.

3.2 Quantitative Results: Patterns of Mobile Technology Use in KM

The results of the quantitative analysis show that the frequency of mobile technology usage has a positive correlation with the effectiveness of knowledge management in educational institutions. As many as 79% of respondents admitted to

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accessing learning materials and institutional information at least once a day using mobile devices. The three main functions that are most frequently used are:

a. Accessing and downloading learning materials (92% of respondents)
b. Communicating in discussion forums (87%)
c. Saving and sharing documents (75%)

The table below shows a summary of the frequency of use of key mobile technology features in the context of knowledge management:

Table 1. Frequency of Mobile Feature Usage for Knowledge Management

Mobile KM Feature	Percentage of Users (%)	Average Frequency (per week)
Accessing learning materials	92%	5.8 times
Discussions via group/chat (WA/Telegram)	87%	6.1 times
Sharing files and links	75%	4.4 times
Uploading assignments or documents	68%	3.2 times
Accessing institutional announcements	65%	2.7 times
Responding to quizzes/surveys	61%	2.1 times
Accessing institutional repositories (Drive/LMS)	54%	1.9 times

3.3 Qualitative Insights: Perceptions and Challenges

From in-depth interviews with 15 key informants (6 educators, 6 students, 3 administrative staff), several main themes emerged:

3.3.1 Perception of Benefits

Educators viewed mobile technology as a catalyst for accelerating teaching cycles and expanding access to learning resources. One university lecturer noted:

"I used to upload learning materials only from my office or home. Now, I can do it from my phone while commuting. Students can access them instantly."

Students reported feeling more comfortable accessing learning content via smartphones rather than laptops due to greater flexibility and convenience. Many mentioned accessing materials during transit or while outside campus.

3.3.2 Technical and Social Challenges

Several challenges were consistently mentioned:

a. Internet connectivity issues, especially in semi-urban areas.
b. Information overload due to multiple discussion groups.
c. Digital literacy gaps, especially among senior teachers.
d. Lack of awareness regarding data privacy and security.

One high school teacher expressed frustration that students often missed announcements because they were buried among dozens of unrelated notifications. This reflects the need for structured digital communication policies and clearly defined content management roles.

3.3.3 Institutional Role

Institutions with clear digital learning policies including mobile LMS usage guidelines, structured training, and consistent infrastructure demonstrated more stable and effective mobile-based KM practices. In contrast, institutions relying solely on individual initiative showed fragmented, undocumented practices.

3.4 Discussion: Interpretation of Findings

The findings of this study support the notion that mobile technology acts as a powerful enabler in knowledge management systems, particularly in educational settings. The widespread use of mobile platforms for accessing learning materials, engaging in group discussions, and sharing academic content indicates that mobile tools significantly accelerate knowledge dissemination. However, the effectiveness of these technologies heavily depends on the digital literacy of users. Educators who lack confidence or experience with mobile platforms are less likely to engage consistently in knowledge-sharing practices, highlighting the urgent need for structured mobile literacy training. Moreover, it is evident that successful mobile-based KM requires more than infrastructure it demands a supportive institutional culture that values documentation, openness, and collaboration. Without this foundation, even advanced mobile tools risk being underutilized or mismanaged. Another issue that emerged is the tendency for fragmented attention, as students often get distracted by social media notifications while using mobile devices for academic purposes. This challenge underscores the need for discipline in mobile use and careful design of mobile learning environments. Finally, institutions with clear digital policies and support structures demonstrated stronger adoption and outcomes. This includes formal communication channels, privacy regulations, and mobile-first strategies embedded in teaching and administrative systems. Collectively,

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these insights suggest that while mobile technology offers significant benefits to KM, its success is ultimately shaped by human factors and organizational readiness.

4.5 Academic and Practical Implications

This study offers several academic and practical implications regarding the integration of mobile technology in educational knowledge management. On a practical level, it emphasizes the need for comprehensive training programs that improve mobile digital literacy among educators, students, and administrative staff. Institutions should not treat mobile adoption as a technical upgrade alone, but as a strategic transformation requiring a clear roadmap—complete with milestones, performance indicators, and sustainability plans. The development of curriculum content that incorporates mobile-supported knowledge management practices, especially in teacher training and digital pedagogy, is essential to foster long-term adoption. Additionally, mobile learning platforms must be optimized for intuitive use to ensure accessibility across varying levels of digital competence. Institutions should also implement periodic evaluations to monitor the effectiveness of mobile KM tools and adapt them as user behavior and technology evolve. On the academic side, this research contributes to filling a gap in the literature, particularly in the context of developing countries where digital infrastructure and educational innovation often progress unevenly. The findings offer empirical evidence that mobile technology, when supported by institutional commitment and cultural readiness, can significantly enhance the effectiveness of knowledge-sharing frameworks. Thus, this study encourages a more holistic view of mobile KM not just as a technical tool, but as a socio-technical system requiring alignment between technology, people, and policy.

4. CONCLUSIONS

This study concludes that mobile technology plays a significant and transformative role in supporting knowledge management within the education sector, particularly by enabling faster, more flexible, and more accessible knowledge sharing among educators, students, and administrative staff. The findings demonstrate that the integration of mobile devices and applications facilitates real-time access to educational resources, enhances collaborative learning, and supports decentralized knowledge distribution, especially in learning environments that extend beyond physical classrooms. However, the success of mobile-based knowledge management is not solely dependent on the technology itself, but rather on how institutions and users adapt to and integrate these tools into their daily academic routines. Key challenges such as digital literacy gaps, inconsistent infrastructure, and the lack of structured institutional policies can significantly undermine the potential benefits. Conversely, institutions that provide clear guidelines, training, and ongoing support show more consistent and impactful outcomes in mobile KM implementation. The research also highlights the importance of fostering a digital culture that encourages active participation, information sharing, and responsible use of technology. Ultimately, mobile technology should not be viewed merely as a convenience or a supplement, but as an essential component of modern educational strategy, one that requires investment in human capacity and institutional alignment to achieve sustainable knowledge-based performance improvements.

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