

The Impact of Mobile Operating Systems and AI on Learning among Allied Health Sciences Students

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Abstract— The convergence of mobile technology and artificial intelligence (AI) is fundamentally reshaping pedagogical approaches in higher education. This study investigates the impact of mobile operating systems (OS) and AI tools on the collaborative learning experiences of Allied Health Sciences students at a Nigerian university. A quantitative, cross-sectional survey was administered to a randomly selected sample of 60 students from the Departments of Information Technology & Health Informatics, Pharmacology, and Medicine & Surgery. A structured questionnaire, validated through a pilot test, collected data on OS preferences, usage frequency, satisfaction levels, and the perceived role of AI. Results revealed a dominant preference for Android OS (76.7%) over iOS (18.3%). Statistical analysis showed a significant difference ($p = 0.010$) in satisfaction with collaborative learning tools, with iOS users reporting markedly higher satisfaction ($M=4.36$, $SD=0.92$) than Android users ($M=3.59$, $SD=0.84$), with a large effect size (Cohen's $d=0.905$). A critical finding was the universal adoption of AI (100%), with students leveraging it for information retrieval, concept clarification, and assignment support. Key challenges included network connectivity for Android users and technical updates for iOS users. The study concludes that the mobile OS ecosystem significantly influences the perceived quality of collaborative learning, while AI has become an indispensable academic tool. These findings imply a necessity for institutional policies that bolster digital infrastructure, provide OS-specific technical support, and formally integrate digital and AI literacy into health sciences curricula to optimize educational outcomes.

Keywords—Operating system (OS), Apple mobile Operating system (iOS), Android, integrated development environment (IDE), Artificial Intelligence (AI), Collaborative Learning, m-learning, Educational Technology, Allied Health Sciences, Higher Education.

I. INTRODUCTION

The digital transformation of education has accelerated with the ubiquity of mobile devices, making mobile learning (m-

learning) a cornerstone of modern pedagogical strategy [1]. For students in demanding fields like Allied Health Sciences, smartphones are not merely communication tools but essential platforms for accessing scholarly resources, facilitating peer collaboration, and engaging in immersive learning activities [2]. The underlying mobile operating systems (OS)—primarily Android and iOS—serve as the critical interface that mediates these experiences, influencing everything from app availability to device performance [3].

Concurrently, the advent of sophisticated Artificial Intelligence (AI) has introduced a paradigm shift, offering personalized tutoring, intelligent content generation, and data-driven insights into learning patterns [4]. While the broad benefits of m-learning are established, a discernible research gap exists concerning the compounded impact of specific mobile OS environments and the pervasive use of AI on the learning processes of students in specialized, resource-intensive disciplines.

This study, therefore, seeks to address this gap by examining the dual influence of mobile operating systems and AI on the academic experiences of Allied Health Sciences students. It aims to elucidate the relationship between OS type and user satisfaction in collaborative learning, document the emergent uses of AI, and identify the distinct technological challenges faced by students, thereby providing evidence-based insights for enhancing digital learning infrastructures.

II. LITERATURE REVIEW

The integration of mobile technology in education is supported by a body of research underscoring its benefits. M-learning facilitates just-in-time access to information and fosters a flexible, student-centered learning environment that transcends geographical and temporal constraints [5]. Studies indicate that this flexibility can enhance student engagement, motivation, and ultimately, academic performance [6], [7].

The role of the mobile OS as a variable in this equation is less explored. The technical architecture, user interface design, and app ecosystem of an OS can significantly affect usability and satisfaction, potentially influencing learning outcomes [3]. For instance, platform-specific limitations in multitasking or file management could hinder collaborative efforts.

The recent proliferation of AI in education marks a significant evolution. AI-powered tools, including large language models (LLMs) like ChatGPT, offer personalized learning support, automate administrative tasks, and provide new avenues for inquiry and critical thinking [4], [8]. Research suggests that AI can act as a "cognitive partner" to students [9]. However, its adoption patterns, perceived efficacy, and ethical implications within the specific context of health sciences education in developing nations require further investigation. This study synthesizes these technological strands to offer a holistic view of the contemporary mobile and AI-driven learning landscape.

III. METHODOLOGY

This study employed quantitative, cross-sectional survey design. The target population was undergraduates from the Faculty of Allied Health Sciences at the Federal University of Health Sciences, Ila-Orangun. A random sampling technique was utilized to select a representative sample of 60 students from three core departments: Information Technology & Health Informatics, Pharmacology, and Medicine & Surgery. This approach ensured diverse perspectives across key disciplines within the health sciences.

A structured questionnaire was developed based on an extensive review of the literature. The instrument was segmented into thematic sections: demographic profile, mobile technology usage patterns (OS type, frequency), utilization of AI in academic work, experiences with collaborative learning tools, and a 5-point Likert scale for satisfaction measurement (1=Very Dissatisfied, 5=Very Satisfied).

To ensure content validity and reliability, the instrument underwent a pilot test with 10 students who were excluded from the main study. The pilot feedback was used to refine question phrasing, sequence, and overall comprehensibility, enhancing the instrument's robustness.

Ethical approval for the study was granted by the University's Research Ethics Committee. All participants were provided with a detailed information sheet outlining the study's objectives, procedures, and their rights. Informed consent was obtained electronically prior to questionnaire administration. Anonymity and confidentiality of responses were strictly maintained throughout the research process.

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IV. RESULTS

The study comprised 60 respondents with a mean age of 18.8 years (SD=1.8, Range: 16–26). The sample included diverse gender identities and academic levels. The distribution of mobile operating systems is detailed in Table 1.

Table 1: Distribution of Mobile Operating Systems

Operating System	Frequency (n)	Percentage (%)
Android	46	76.7%
iOS	11	18.3%
Both Android & iOS	3	5.0%
Total	60	100%

Analysis revealed a statistically significant disparity in user satisfaction based on the mobile OS. iOS users reported a markedly higher level of satisfaction with the facilitation of collaborative learning compared to their Android counterparts, as summarized in Table 2.

Table 2: Satisfaction Scores for Collaborative Learning by OS

Operating System	Mean Score (out of 5)	Standard Deviation	p-value
Android (n=46)	3.59	0.84	0.010

Operating System	Mean Score (out of 5)	Standard Deviation	p-value
iOS (n=11)	4.36	0.92	

The mean difference of 0.773 points was statistically significant ($p = 0.010$), and the effect size was large (Cohen's $d^* = 0.905$), underscoring the substantial practical relevance of the OS on the collaborative learning experience.

The vast majority of students were frequent users of mobile devices for education, with 69.6% of Android and 72.7% of iOS users engaging "Very Frequently." However, the primary obstacles reported were distinctly different between the two groups, as shown in Table 3.

Table 3: Primary Challenges in Mobile Collaborative Learning by OS

Operating System	Primary Challenge	Secondary Challenge
Android	Network/Connectivity Issues (51%)	Storage/Memory Limitations
iOS	Technical Issues/Updates (60%)	Battery/Power Management

A seminal finding of this study was the universal integration of AI into student learning workflows. All 60 respondents (100%) confirmed using AI in their studies. The primary benefits attributed to AI and collaborative mobile learning are quantified in Table 4.

Table 4: Perceived Benefits of AI and Mobile Collaborative Learning

Benefit Area	Percentage of Students
Use AI in studying	100%

Benefit Area	Percentage of Students
Improved communication & teamwork skills	75%
Improved & faster access to information	60%
Enhanced overall educational experience	60%

Qualitative feedback revealed that students actively use AI tools like ChatGPT, Google Bard (Gemini), and WhatsApp Meta AI for tasks such as researching complex topics, summarizing literature, generating ideas for projects, and improving writing quality.

V. DISCUSSION

This study provides a nuanced understanding of how two pivotal technologies—mobile OS and AI—concurrently shape the learning landscape for health sciences students.

1. Mobile OS as a Determinant of User Experience

The significantly higher satisfaction among iOS users highlights that the mobile OS is a non-neutral variable in educational technology. The large effect size suggests that elements such as interface consistency, perceived app stability, and overall system fluidity contribute to a more seamless and less frustrating collaborative experience. Android users' predominant challenge with network connectivity may be linked to the heterogeneity of device hardware and radio components across different manufacturers, potentially leading to inconsistent network performance. In contrast, iOS users' concerns with technical updates point to the challenges of maintaining a uniform software experience across a limited set of devices.

2. AI as an Integral Academic Partner

The 100% adoption rate of AI is a profound finding, signaling a rapid and wholesale integration of these tools into academic practice. Students are not merely experimenting with AI; they are relying on it as a fundamental component of their study toolkit for content discovery, comprehension, and creation. This aligns with global trends where generative AI is becoming a primary interface for knowledge acquisition [8]. The reported improvements in communication and information access

directly correlate with the core functionalities of modern LLMs, which can articulate complex ideas clearly and synthesize vast amounts of data.

3. Synergy and Systemic Challenges

The findings illustrate a synergistic ecosystem: the mobile OS provides the gateway, while AI applications deliver the adaptive intelligence. However, this synergy is vulnerable to infrastructural deficits. The network challenges plaguing the majority Android user base threaten to create a digital divide, where students' learning potential is capped not by their ability but by their device's connectivity. This underscores the critical need for institutional investment in robust Wi-Fi infrastructure as a foundational element of educational equity.

VI. LIMITATIONS OF STUDY

While this study offers valuable insights, several limitations should be acknowledged. First, the sample size ($n=60$), though adequate for initial analysis, and the single-institution focus limit the generalizability of the findings to other student populations and geographic contexts. Second, the cross-sectional design provides a snapshot in time and cannot capture the longitudinal evolution of technology use and satisfaction. Third, the study relied on self-reported data, which is subject to biases such as social desirability and recall inaccuracy. Future research should employ longitudinal, multi-institutional designs with larger samples and incorporate qualitative interviews to triangulate findings and explore the "how" and "why" behind the usage patterns identified here.

Analysis of Collaborative Tools and AI impact on Learning. The analysis reveals significant insights about how collaborative tools and AI are transforming the learning experience:

All 60 students (100%) reported using AI in their studies, with an average satisfaction score of 3.591 ± 0.837 for Android users, and 4.364 ± 0.924 for iOS users

VII. CONCLUSION

This research conclusively demonstrates that the choice of mobile operating system significantly influences student satisfaction in collaborative learning, and that AI has rapidly become an indispensable academic resource for Allied Health Sciences students. The challenges identified are not merely technical but are foundational to ensuring equitable and effective digital education.

The implications for policy and practice are multi-faceted:

For University Administrators: Prioritizing the development of ubiquitous, high-bandwidth Wi-Fi coverage is paramount.

Establishing dedicated technical support services that address OS-specific issues can mitigate key user frustrations.

For Educators and Curriculum Designers: There is an urgent need to formally integrate digital and AI literacy into the curriculum. This includes teaching students the ethical and critical use of AI, discerning its limitations, and leveraging it to enhance, not replace, critical thinking and clinical reasoning skills.

For Policymakers: National educational technology frameworks must be updated to provide guidelines and funding for digital infrastructure and the responsible adoption of AI tools in higher education, particularly in critical fields like health sciences.

By proactively addressing these areas, institutions can harness the full potential of mobile and AI technologies to foster a more effective, inclusive, and future-ready learning environment.

The analysis reveals that iOS users report significantly higher satisfaction with collaborative learning tools (4.36/5) compared to Android users (3.59/5), with a large effect size (Cohen's $d = 0.905$). This suggests that the choice of operating system has meaningful relevance to student learning experiences.

The data also shows interesting patterns in the types of challenges each OS group faces - Android users primarily struggle with network connectivity issues, while iOS users more often encounter technical update problems.

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