Assessing the Influence of Smartphone Applications on Students' Reading Culture and Use of Library Resources among Undergraduate Students of Selected Nigerian Universities

By

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Abstract

The rapid growth of mobile technology has transformed how students access information, read, and engage with academic resources. In Nigerian universities, smartphones are increasingly being used for library services, e-learning, and reading activities. However, concerns exist about whether these phones promote or hinder effective library service utilization and reading culture among undergraduates. The study examine the extent of smartphones usage for library services among Nigerian undergraduates, investigate the influence of smartphones on students' reading culture, and identified challenges associated with smartphone use for academic purposes. The study adopted a mixed research method approach. Questionnaires and focus group discussions were used to gather data, while descriptive statistics and thematic analysis were applied for data analysis. The findings revealed that, while smartphone applications increase access to electronic resources, facilitate online catalogue searches, and support virtual reference services, they also contribute to distraction, reduced attention span, and a preference for social media over academic reading. The study concludes that smartphone play a dual role i.e. enhancing library service utilization while simultaneously eroding deep reading culture. Recommendations include integrating mobile-friendly library platforms, implementing digital literacy training, and encouraging balanced use of smartphone applications to strengthen both academic engagement and sustainable reading culture.

Keywords: *Smartphones, library services, reading culture, undergraduates, Nigerian universities.*

Introduction

The rapid diffusion of smartphone technology has transformed the way information is accessed, shared, and consumed globally. In higher education, particularly in developing countries such as Nigeria, smartphones and their applications have become indispensable tools for communication, learning, and research (Akeriwa, Penzhorn, & Holmner, 2015). With thousands of mobile applications designed for academic and non-academic purposes, university students increasingly rely on smartphones not only for social interaction but also for educational engagement. This trend has implications for library service utilization and the reading culture of undergraduates. University libraries traditionally serve as primary gateways to scholarly information through print and electronic resources. However, the proliferation of smartphone applications such as e-libraries, e-books, databases, and social media platforms is reshaping students' information-seeking behavior (Otunla, 2016). Many students prefer the convenience of accessing information via smartphones rather than physically visiting the library, raising concerns about declining library patronage and changes in students' reading habits.

The reading culture among Nigerian undergraduates has long been described as weak due to limited access to resources, poor library services, and a growing preference for non-academic online content (Ogunrombi & Adio, 1995; Nnadozie, 2020). The ubiquity of smartphones further complicates this situation, as students are often distracted by entertainment applications at the expense of academic reading. At the same time, mobile technology presents opportunities to revive reading culture by providing digital platforms for accessing e-books, journals, and open educational resources (Okiki, 2012).

In this context, smartphone applications can be seen both as a challenge and an opportunity for academic libraries. On one hand, they contribute to reduced physical visits and underutilization of reference services. On the other hand, they can enhance access to information, promote independent learning, and expand the reach of library services beyond physical walls (Ani & Edem, 2019). The extent to which Nigerian undergraduates adopt smartphone applications for academic purposes, and how this impacts their reading culture and library use, remains an important area of investigation.

Therefore, this study seeks to examine the impact of smartphone applications on library service utilization and reading culture among undergraduate students in Nigerian universities. By understanding these dynamics, the study will provide insights into how libraries can reposition themselves in a mobile-driven academic environment and how students' reading culture can be strengthened in the digital age.

Objectives of the Study

1. To examine the extent of smartphone usage for library services among Nigerian undergraduates.

2. To investigate the influence of smartphone applications on students' reading culture among Nigerian undergraduates.

3. To identify challenges associated with smartphone use for academic purposes among Nigerian undergraduates.

Literature Review
Smartphone Applications in Higher Education

Smartphone applications have become indispensable in higher education, offering students and researchers instant access to academic resources such as online catalogues, databases, and e-resources. This reflects the growing adoption of mobile learning (m-learning), where learners access and manage educational content from any location. By providing flexible and portable access to information, smartphone apps have transformed how students interact with academic libraries, coursework, and study materials (Adebayo & Omole, 2021). Beyond access to information, smartphone apps enhance engagement, collaboration, and interactivity. Features such as gamification, audience response systems, and shared digital workspaces encourage participation and active learning. Students can collaborate on projects, engage in discussions, and communicate with peers and instructors in real time, fostering stronger academic networks. Research shows that mobile apps improve communication, motivation, and perceived quality of work, making them central to student engagement (Aina, 2024).

Smartphone applications also support higher-order thinking and research activities. When integrated effectively into pedagogy, mobile tools promote critical skills such as application, analysis, and evaluation. For research purposes, they enable real-time data collection, fieldwork

documentation, and context-rich insights, while also boosting students' self-efficacy and academic performance. Many students rely on smartphones as all-in-one tools for accessing lecture notes, recording lessons, and preparing presentations, thereby increasing productivity and confidence (Ajiboye & Tella, 2017). Despite their benefits, several challenges hinder effective smartphone use in academia. These include usability issues, inequitable access to devices and internet connectivity, faculty unpreparedness to integrate technology, and the risk of distraction from social media or entertainment apps. Addressing these challenges requires strategies such as professional development for instructors, improved infrastructure, responsive app design, and the promotion of digital self-regulation. Evidence from studies in Nigeria and Saudi Arabia underscores both the opportunities and barriers, highlighting the importance of structured and context-sensitive integration of smartphone apps in higher education (Edem & Ani, 2020).

Library Service Utilization and Mobile Technology

The integration of mobile applications in higher education has transformed students' interaction with library resources. Through mobile apps, learners can now access OPACs, e-books, journals, and virtual reference services, enabling them to search, download, and consult resources without physically visiting the library. This convenience reflects a broader global shift in academic libraries toward embedding mobile technologies to meet the demands of digital-native students (Ukachi, 2025). The widespread use of smartphones has also fostered self-directed learning, allowing students to study and explore academic materials beyond traditional library hours. Libraries that embrace mobile platforms report higher levels of engagement and satisfaction, with added features like database access, virtual chats, and notifications for new resources strengthening their role in supporting students' academic activities (Popoola, 2018).

Despite these benefits, concerns remain about the overreliance on mobile technology, which has led to a decline in the use of traditional library facilities. Students increasingly favour quick online searches over deeper interactions with physical collections, reducing their exposure to valuable print-only materials and one-on-one guidance from librarians. This trend risks limiting their engagement with resources critical for advanced research and critical thinking (Ukachi, 2025). Consequently, libraries face the challenge of balancing mobile and traditional services. A hybrid approach combining mobile apps with strong physical library engagement can ensure students benefit from the strengths of both formats. Strategies such as library orientations, blended resource promotion, and integration of mobile and on-site services are essential in maintaining this balance, ultimately enriching students' academic experiences (Musa et al, 2023).

Reading Culture and Technology

The increasing use of smartphones and digital platforms has reshaped reading habits, often favoring skimming and surface-level engagement over deep, reflective reading. Scholars like Maryanne Wolf caution that constant exposure to digital texts trains the brain toward rapid scanning, which may improve browsing efficiency but undermines comprehension and the ability to process complex academic arguments. This trend risks weakening students' capacity for critical engagement with scholarly texts (Ajayi et al,). Digital distractions further compound this issue. Mobile environments are saturated with notifications, ads, and social media prompts, which interrupt reading and fragment attention. Studies, particularly in China, show that students often engage with academic texts in short, disrupted bursts, leading to reduced memory retention and weakened comprehension (Edem & Ani, 2020). Controlled experiments using eye-tracking

confirm that interruptions whether auditory or visual make it difficult for learners to sustain focus during mobile reading (Ogunbodede & Sawyerr-George, 2023).

Media multitasking also places significant cognitive demands on students. Constant switching between apps, notifications, and reading creates an overload on working memory and attentional control, encouraging shallow rather than in-depth processing of texts. This "breadth-biased" approach prioritizes rapid scanning over deep understanding, thereby diminishing the development of higher-order reading skills necessary for academic success (Almaiah et al, 2020). Lastly, the academic implications are evident in performance outcomes. Research shows that the mere presence of smartphones can reduce cognitive capacity, while their removal in classroom settings improves comprehension and mindfulness. Frequent phone interruptions correlate with lower academic achievement, and social media especially among younger students often acts as a major disruptor. For instance, studies in South Africa revealed that heavy social media use negatively affected assignment completion, underscoring the tension between mobile technology and sustained academic engagement (Keshavarzi & Thanos, 2020).

Challenges in the Use of Smartphone Applications on Library Service Utilization
Although smartphones present significant opportunities for enhancing higher education, their effective use is hindered by several challenges, particularly in resource-constrained contexts. One of the most frequently cited issues is digital distraction. Faculty and students alike often perceive smartphones as disruptive, with small screens and limited input capacities making them less practical for complex tasks. It was found that, students have real distractions from smartphones which negatively impact academic performance in higher institution in Nigeria, highlighting the need for greater regulatory strategies (Edem & Ani, 2020). Another key barrier is poor internet connectivity and the high cost of mobile data, which significantly limit access to academic resources. Students in open and distance e-learning programs, for instance, often report that expensive data plans and slow bandwidth interfere with their ability to fully engage with course materials. Broader infrastructural challenges including unstable internet services, power outages, and inconsistent electricity supply further exacerbate these limitations, making smartphone use for academic purposes unreliable (Muilenburg & Berge, 2025).

A third challenge lies in limited ICT literacy, which reduces students' ability to maximize smartphone-based learning. Many lack the digital skills needed to navigate learning platforms, share documents effectively, or manage online assignments. This issue is particularly acute in sub-Saharan Africa, where inadequate training and minimal institutional support leave students ill-prepared to use digital tools. Evidence also suggests that students who rely solely on smartphones, without access to computers, report weaker ICT competencies, negatively affecting their academic experience (Igwe & Onah, 2023). Consequently, structural and financial barriers such as the high cost of mobile data and underfunded ICT infrastructure continue to widen the digital divide in many developing countries. Students often require substantial monthly data allowances to meaningfully participate in e-learning, yet affordability remains a problem. At the institutional level, limited budgets for installing and maintaining ICT infrastructure constrain access to reliable digital resources. This persistent gap in device access, connectivity, and affordability creates inequities in academic opportunities, limiting the transformative potential of smartphones in higher education (Adebayo & Omole, 2021).

Methodology

A mixed-method was employed as the research approach. Therefore, the data were sourced through the use of questionnaire and interview. The population consist of 1500 undergraduate students gotten from the selected Nigerian universities from north eastern part of the country i.e Bauch, Gombe and Yobe.

A stratified random sampling technique was employed in drawing the required sample size where a total of 300 undergraduate students were selected for the quantitative population using Krejcie and Morgan's (1970) sample size determination table. Hence, the researcher employed purposive sampling as a technique for selecting participants for the interview.

A structured questionnaire and focused group were used for data collection. Quantitative data was analysed using descriptive statistics such as mean, median, percentages, and frequency tables while the qualitative data was analysed using thematic analysis.

Results and Analysis
1. Extent of smartphone usage for library services
Table 1: Purpose of use

This table describes how often respondents use resources for different purposes (Likert Scale: 1= Never, 2= Rarely, 3= Sometimes, 4= Often, 5= Always).

S/N	Purpose of Use	Mean	Median	Std. Deviation	Min	Max
1	For Assignments	4.2	4	0.8	2	5
2	For Independent Research	3.3	3	0.9	2	5

The above table shows that the resources are used more for assignments than independent research.

Table 2: Resource Preference
This table describes respondents' preference between different search tools (Likert Scale: 1=Strongly Prefer Google, 2=Prefer Google, 3=Neutral, 4=Prefer Library Database, 5=Strongly Prefer Library Database).

S/N	Preference	Mean	Median	Std. Deviation	Min	Max
1	Google vs. Library Database	2.8	3	1.1	1	5

The above table shows that there is a slight overall preference for Google over library databases, with opinions highly polarized.

Table 3. Frequency Counts and Percentages for Preferences
This table shows the frequency and percentage of respondents who indicated smartphones preferences

S/N	Preference Level	Frequency (Count)	Percentage (%)
1	Strongly Prefer smart phones (1)	4	13.3%
2	Prefer smartphones (2)	9	30.0%
3	Neutral	7	23.3%
4	Prefer Library Database	6	20.0%
5	Strongly Prefer Library Database	4	13.3%

This table above shows the distribution of responses for the preference question. Four respondents (13.3%) strongly prefer google, while nine respondents (30.0%) prefer google as their search tools for resources. Then seven respondents (23.3%) remain neutral. However, six respondents (20.0%) prefer library database and four respondents (13.3%) strongly prefer library database as their search tool.

2. Influence of smartphone on students reading culture

Table 4: smartphone and student's reading culture

Variable	Agree (%)	Disagree (%)	Neutral (%)
Smart phone usage reduces reading time	210 (70**%**)	60 (**20%**)	30 (**10%**)
Smartphone addiction leads to poor reading habits	**240 (80%)**	40 (**13%**)	**20 (7%)**
Easy access to online content reduces book reading	**220 (73%)**	**50 (17%)**	**30 (10%)**
Smartphones notification distract from reading	**250 (83%)**	**30 (10%)**	**20 (70%)**
Overall impact on reading habit	**230 (77%)**	**50 (17%)**	20 (**7%**)

The table indicate that smart phones have negative influence on student reading culture with majority agreeing that; smartphone usage reduces reading time 70%. Smartphone addiction leads to poor reading habit 80%. Easy access to online content reduces book reading 73% smartphone notification distract from reading (83%).

3. Challenges associated with smartphone use for academic purpose.

Table 5: Perceived Challenges of Smartphone Usage on library resources
This table describes the degree to which respondents perceive different factors as challenges.

S/N	Challenge	Mean	Median	Std. Deviation	Min	Max
1	Inadequate Orientation	3.8	4	0.7	2	5
2	Poor ICT Skills	4.1	4	0.7	3	5
3	Lack of E-Resources	4.1	4	0.5	3	5
4	Limited Reference Staff	3.3	3	0.8	2	5

The above table shows that the top challenges are poor ICT skills and lack of e-resources, followed by inadequate orientation. However, limited staff was the least cited challenge of smartphone use.

The extent of smartphone applications on library service utilization

The participants gave their opinions on the extent of smartphone applications on library service utilization. The themes that emerged from the respondent's explanation includes: extent of enhancing access to library resources, convenience and anytime–anywhere use, reduced physical library visits, improved awareness of library services and user-friendly and personalized services

The influence of smartphone applications on students' reading culture
The participants gave their opinions on the influence of smartphone applications on students' reading culture. The themes that emerged from the respondent's explanation includes: increased

accessibility to reading materials, shift from print to digital reading, distraction and reduced deep reading, preference for short, informal content, improved reading motivation and engagement.

Challenges associated with smartphone use for academic purposes

The participants gave their opinions on the challenges associated with smartphone use for academic purposes. The themes that emerged from the respondent's explanation includes: distraction and divided attention, poor time management and overuse, limited concentration and shallow learning, academic dependence and reduced critical skills, technical and connectivity challenges and health and well-being concerns.

Discussion of Findings
The findings of this study reveal that undergraduate students demonstrated high usage extent of basic smart phone applications such as OPACs, e-books, journals, and virtual reference services, with 100% recognition across respondents. However, this aligns with earlier studies which reported that Nigerian undergraduates tend to rely heavily on smartphone applications while underutilizing specialized resources due to limited exposure and inadequate library orientation (Aina, 2014; Edem & Ani, 2020).
In terms of utilization patterns, the results indicate that smartphones applications resources are primarily used for assignments (Mean=4.2) rather than for independent research (Mean=3.3). This reflects a task-driven usage pattern, where students consult resources mainly when compelled by academic requirements, rather than out of self-directed inquiry. This finding is consistent with the work of Ajiboye and Tella (2007), who found that undergraduates often use library resources to meet immediate academic obligations, such as coursework, rather than cultivating a sustained research culture. This highlights the need for strategies that encourage broader and more autonomous use of smart phones application in libraries beyond assignment-related purposes.
The findings on resource preference revealed a slight tilt towards smartphone applications over library physical books (Mean=2.8), with 43.3% of respondents indicating some preference for smartphones and only 33.3% showing preference for library physical books. This polarization reflects the wider trend of students' reliance on internet search engines for quick information retrieval rather than engaging with curated hard copy books (Ukachi, 2015). While the applications offers accessibility and convenience, over-reliance on it may compromise research quality due to difficulties in assessing credibility and scholarly value. This underscores the necessity of promoting information literacy programs to enhance students' capacity to effectively use academic databases.
Regarding challenges, the study found that poor ICT skills (Mean=4.1) and lack of e-resources (Mean=4.1) were the most pressing barriers, followed by inadequate orientation (Mean=3.8). Limited reference staff (Mean=3.3) was the least cited. These findings corroborate earlier research by Adebayo and Omole (2021), who emphasized that ICT incompetence, combined with infrastructural limitations in Nigerian university libraries, hampers effective use of electronic resources. The results also affirm that lack of structured user education perpetuates underutilization of advanced reference services, suggesting a gap in the support system for students.
Conclusion

This study concludes that smartphone applications have a twofold impact on the academic engagement and reading culture of Nigerian undergraduates. While these devices serve as indispensable tools that democratize access to e-libraries, reference databases, and scholarly platforms, their non-academic attractions simultaneously foster addiction engagement and threaten traditional deep reading habits. To mitigate these distractions and prevent the erosion of critical thinking, deliberate institutional and pedagogical interventions are urgently required. By strengthening information literacy programs and providing proactive guidance, university libraries and educators can help students strike a vital balance effectively harnessing mobile technology for academic empowerment while preserving the integrity of sustained, critical inquiry.

Recommendations

1. University libraries should prioritize the development of mobile-friendly platforms that allow students to access resources conveniently. This includes apps and optimized interfaces for online public access catalogues (OPAC), electronic databases, and e-books. Such innovations will ensure that students can easily locate and utilize academic materials directly from their smartphones.
2. . Efforts should also focus on cultivating strong reading habits through interactive initiatives. Libraries and faculties can introduce reading clubs, digital book discussions, and gamified reading challenges to make academic reading more appealing. These initiatives will help sustain deep reading culture among undergraduates despite the distractions of digital entertainment.
3. Students should be provided with digital literacy training to enhance their ability to use academic applications effectively. Training should also cover time management strategies, enabling undergraduates to balance academic use of smartphones with leisure activities. This will help minimize distractions and ensure that smartphones serve primarily as tools for academic advancement. Also, universities should collaborate with telecommunication providers to make educational data more affordable for students. Reduced costs for accessing e-resources and academic platforms will ensure equity of access, enabling more students to benefit from digital library services regardless of their financial background.

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