

Smartphone Usage and Academic Performance of Management Science Students in an Emerging Economy

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ABSTRACT

Smartphone usage among students in tertiary institutions, particularly management sciences students, has generated concerns due to its potential negative effects on their academic performance and overall well-being. While smartphones are known to improve students' academic outcomes, their excessive use can lead to distractions and a decline in academic achievement, especially in developing economies. This study investigates the impact of smartphone usage on the academic performance of students in selected universities in southeast Nigeria. A cross-sectional survey was conducted among 300-level management science students at three public universities, with data collected through 221 valid questionnaires. The study found that students' academic performance is positively influenced by the perceived ease of use, usefulness, and enjoyment of smartphones. However, excessive use, particularly for non-academic purposes, negatively affects performance by causing distractions, addiction, and superficial learning. This study concludes that while smartphones can be a valuable academic tool, excessive usage for non-academic activities can hinder students' academic performance. Effective management of smartphone use is essential for academic success.

Keywords: Academic Performance; Management Sciences; Nigeria; Smartphone; Students

INTRODUCTION

The utilization of smartphones by students in Nigerian universities has produced both beneficial and detrimental outcomes. Smartphones are integral to modern life, profoundly influencing communication, information accessibility, and daily human activities (Zhu et al., 2024). The incorporation of smartphones has impacted students' academic performance and personal lives, offering both benefits and challenges. The integration of mobile technology in education has prompted considerable discussion among researchers, educators, and policymakers regarding its effects on learning, student performance, and societal implications (Wang et al., 2023). Wang et al. (2023) assert that as smartphones evolve from basic communication tools to advanced platforms for information access and social media engagement, understanding student interactions with these devices is crucial for fostering healthy digital habits and improving their educational effectiveness.

A few years ago, there was a significant increase in smartphone ownership among students, reflecting the global trend of increased mobile technology utilization (Wang & Ma, 2024). A survey indicated that more than 95% of students at universities in Sub-Saharan Africa own or have access to a smartphone, a trend observed in several other countries worldwide (Ortutay, 2024). Smartphones serve various purposes, such as academic research, note-taking, communication with peers, and participation in online learning platforms. Their adaptable nature makes them appealing to students, who can easily transition between academic obligations and personal interests. This accessibility, however, raises concerns about distraction, overuse, and the potential for smartphone addiction. While cell phones provide various conveniences, their widespread use in both formal and informal educational settings has prompted concerns about their long-term effects on student performance and well-being (Kibona & Mgaya, 2015).

A survey indicates that a primary advantage of smartphones in the university environment is their ability to facilitate prompt access to information (Anshari et al., 2017). Students can efficiently access scholarly articles, educational films, and various academic resources with minimal screen interactions. Smartphones and mobile applications, including Google Meet, Microsoft Teams, and Zoom, enhance student collaboration and engagement with course material outside traditional classroom settings (Siyami et al., 2023). This improved accessibility bridges formal education and independent learning, allowing students to take charge of their academic progress. Nigerian university students can leverage mobile applications to tailor their study sessions, engage in online tutoring, and track their academic progress.

Smartphones offer various tools and resources designed to meet the specific needs of individuals with learning difficulties or students requiring additional support. Smartphones greatly improve collaborative communication among students. Collaborative projects and assignments are more efficient owing to messaging applications, social media platforms, and cloud-based services that enable real-time communication and file sharing (Edeh et al., 2021a). With the growing adoption of blended learning methodologies that combine in-person and online instruction, the role of smartphones as a medium for both synchronous and asynchronous learning is set to expand.

While smartphones provide numerous benefits, their overuse poses significant challenges to students' academic performance and emotional health (Ahmed et al., 2020). A primary concern is distraction. The continuous notifications from social media, instant messaging, and entertainment applications frequently divert students from their academic activities. Studies demonstrate that frequent multitasking between academic

activities and smartphone use leads to reduced retention rates, impaired comprehension, and lower academic performance (Wang et al., 2023).

The increase in smartphone addiction is a growing concern. Hashemi et al. (2024) noted that a considerable proportion of university students experience anxiety or discomfort when separated from their devices, a phenomenon referred to as "nomophobia" (the fear of being without a mobile phone). The compulsive desire to monitor notifications, engage with social media, and maintain internet connectivity can hinder students' ability to focus on academic activities and develop meaningful in-person interactions. Furthermore, Peng et al. (2022) indicated that excessive smartphone use among university students correlates with poor sleep habits, anxiety, and depression, all of which can negatively impact academic performance. Moreover, smartphones may exacerbate issues related to cyberbullying and the pressure to conform to social media standards. Students dedicating considerable time to social networking platforms may experience feelings of inadequacy or encounter online harassment (Hashemi et al., 2024). Negative social experiences can result in reduced self-esteem and mental health, subsequently affecting students' academic and social functioning (Autlama et al., 2021).

The growing prevalence of cell phones among students necessitates a balance between utilizing their educational potential and mitigating the negative consequences of excessive use. Educational institutions and instructors are examining methods to integrate smartphones into the learning process while setting guidelines to reduce distractions. Various educational institutions have implemented "no-phone" policies during class hours, whereas others allow smartphone use solely for specific academic purposes (Ahmed et al., 2020). Digital literacy initiatives are being developed to educate university students on responsible technology use, management of screen time, and critical assessment of online content (Peng et al., 2022). Parental engagement is crucial for helping students develop appropriate smartphone practices. Lin et al. (2021) indicated that by implementing regulations for smartphone use at home and demonstrating positive behaviors, parents can effectively reduce the negative effects associated with excessive screen time. Clear communication about the potential risks of social media and the importance of balancing online and offline interactions is crucial for fostering a healthy relationship between students and their smartphones.

Smartphones present significant risks related to distraction and overuse. However, they also offer substantial learning opportunities for students. Consequently, collaboration among teachers, parents, and students is essential to identify strategies for leveraging this technology positively while mitigating its adverse effects as it continues to evolve. Understanding the complexities of students' smartphone usage can enhance societal initiatives aimed at fostering healthy behaviors and ensuring that mobile technology enhances rather than detracts from the educational experience (Hashemi et al., 2024). Thus, the main objective of this study is to investigate the effect of smartphone usage on students' academic performance. The significance of this study is that it would reveal the benefits and demerits of smartphone usage on the academic performance of tertiary institutions in Nigeria. Thus, the novelty of this study has filled the gaps in previous investigations.

LITERATURE REVIEW

Student Academic Performance

Academic success is crucial in global education systems, influencing individual students and social outcomes at large (Ahmed et al., 2020). It involves more than just grades; it shows a student's learning, competencies, and holistic development across several subjects and disciplines. The importance of academic success transcends educational

settings, impacting social, economic, and personal dimensions of life. High academic success can cultivate a sense of achievement, enhancing self-confidence and perseverance. Research demonstrates that academically successful children frequently cultivate elevated self-esteem, attributing their achievements to their efforts and capabilities (Bhatt & Gaur, 2019). Furthermore, the mastery of academic knowledge and the acquisition of problem-solving and critical-thinking abilities might enable pupils to confront future obstacles with enhanced confidence (Wang & Ma, 2024). Thirdly, robust academic performance furnishes essential skills and information vital for higher education and the employment sector. Numerous jobs necessitate higher education and training, and academic achievement can facilitate access to scholarships, advanced study programs, and superior employment prospects.

A study by Peng et al. (2022) illustrates the relationship between academic achievement in high school and future career opportunities, indicating that strong grades are associated with increased incomes and job security. Moreover, academic success has been associated with improved health outcomes. Studies indicate that those with elevated educational levels, typically based on strong academic performance, are more inclined to adopt healthy behaviors, possess improved access to healthcare, and encounter reduced incidences of chronic illness (Lin et al., 2021). Academic success at the student level enhances the quality of the future workforce, benefiting society (Edeh et al., 2021a). High-achieving pupils are more equipped to address the challenges of a complex, dynamic economy, perhaps resulting in enhanced productivity and economic expansion. Hashemi et al. (2024) discovered that nations exhibiting elevated academic achievement levels generally undergo accelerated economic expansion, as educated individuals are more inclined to foster innovation, technical progress, and productivity across diverse industries.

Academic performance is essential in facilitating social mobility, especially for children from underprivileged backgrounds. Through academic excellence, kids can disrupt cycles of poverty and attain opportunities previously inaccessible to their families, thus contributing to the reduction of social inequities over time. Moreover, high-achieving students promote more equitable communities by frequently supporting policies and practices that encourage inclusiveness, justice, and equal opportunity (Edeh et al., 2021b). Education systems seek to equip students for employment while also fostering informed, engaged citizens (Edeh et al., 2024). Students possessing robust academic backgrounds tend to be more informed about social concerns and are more inclined to participate in civic responsibilities, like voting and volunteering.

Academic achievement correlates with increased civic involvement, as students acquire critical thinking abilities that enable them to understand and engage with social and political issues (Shruthi & Indiramma, 2019). Academic achievement is frequently utilized to evaluate the efficacy of educational systems and policies. Kosola et al. (2024) stressed that test results and grades yield information that guides decisions regarding curriculum modifications, educator training, and budget allocation. Institutions exhibiting superior academic achievement can attract increased financing and resources, hence improving student results. Educational changes designed to enhance academic achievement frequently prioritize fair access to excellent instruction, resources, and learning environments, thereby benefiting society. The academic performance of pupils influences a nation's capacity to compete globally. Elevated academic performance fosters a proficient labor population, essential for a nation's competitiveness in sectors such as technology, engineering, and science.

While academic excellence contributes to society, it also presents obstacles. Ahmed, et al. (2020) affirmed that although academic success is important, excessive reliance on

test scores and grades can induce unnecessary stress and promote a limited concentration on rote memory instead of profound learning. This has prompted demands for a more comprehensive method of evaluating student progress, considering emotional intelligence, creativity, and social abilities. Educational leaders acknowledge the significance of cultivating well-rounded persons capable of making important contributions to society, transcending just academic success (Edeh et al., 2024; Kee et al., 2022). Ultimately, it promotes personal development, fosters economic and social progress, and influences the global competitive environment. Academic success must be considered within the wider framework of student development, highlighting the significance of a comprehensive education (Lin et al., 2021). By emphasizing holistic approaches, educational systems can more effectively assist students in achieving their full potential and making enduring contributions to society.

Smartphone

The smartphone, a portable multi-functional device, has profoundly altered human communication, social interaction, productivity, and entertainment (Ochs & Sauer, 2022; Raj et al., 2023). Bhatt and Gaur (2019) contended that smartphones were originally perceived as communication tools. However, they have developed into indispensable devices that integrate internet access, computing power, multimedia functionalities, and personal management features. Liu (2023) added that the influence of smartphones on multiple domains has been a central concern for researchers in various fields. This review analyzes the current literature regarding smartphones, emphasizing their social, psychological, educational, and health effects. The development of smartphones is linked to the integration of computing and telecommunications technologies, with IBM's Simon Personal Communicator, introduced in 1994, being the first widely acknowledged smartphone (Kosola et al., 2024; Skowronek et al., 2023). Studies have shown significant advancements in smartphones since the early 2000s, propelled by companies like Apple and Samsung (Skowronek et al., 2023). Their devices introduced touchscreens and mobile applications, establishing ecosystems that standardized the smartphone experience. Research indicates that technological advances have rendered smartphones essential in everyday life, fundamentally altering societal interactions with technology (Wang & Ma, 2024; Zhu et al., 2024).

Smartphones have significantly altered social interaction, resulting in both beneficial and detrimental effects. Research indicates that smartphones enable immediate communication and connectivity, thereby assisting individuals in sustaining relationships across distances and time zones (Ochs & Sauer, 2022; Raj et al., 2023). Social media applications such as Instagram and Facebook, accessible on smartphones, have become essential for social interaction and experience sharing. Other studies highlight the potential for smartphone addiction and its negative impacts on face-to-face communication, mental health, and social skills (Wang & Ma, 2024; Zhu et al., 2024). Another research has revealed that the 'fear of missing out' (FOMO) and the pressure to continuously engage with digital platforms are significant issues associated with smartphone use of social media (Hartley et al., 2023). Smartphones influence social and behavioral dynamics by offering entertainment, information, and emotional support via connectivity and mental health applications. Prior investigation has shown that excessive use may lead to anxiety, stress, and sleep disturbances (Ibragimov et al., 2023). Fook et al. (2021) contend that smartphone usage may result in attention deficits and cognitive overload, as incessant notifications and app-switching contribute to fragmented attention spans. Furthermore, phenomena like 'phantom vibration syndrome' - the sensation of a phone vibrating when it is not - demonstrate the profound impact smartphones have on the psyche (Ahmed et al., 2020).

Smartphones provide access to extensive learning resources, educational applications, and digital classrooms, thereby enhancing self-directed learning and enabling collaboration among students (Shree et al., 2024; Sumuer, 2021). Conversely, numerous studies emphasize the potential for distraction, as students may struggle to balance smartphone usage with a focus on academic tasks. Consequently, researchers are examining methods for incorporating smartphones to enhance educational advantages while reducing potential distractions (Shruthi & Indiramma, 2019). Health concerns are associated with smartphones. Common concerns among heavy users include physical issues such as eye strain, neck pain, and repetitive strain injuries. Additionally, sleep quality is significantly impacted by smartphone usage before sleep, as the blue light from screens can interfere with circadian rhythms and decrease melatonin production (Han & Yi, 2019). A prior study has demonstrated that 'smartphone detox' initiatives or technology breaks may alleviate these effects, as users grow more cognizant of the health implications (Zhu et al., 2024).

Simultaneously, a survey has revealed that smartphones are altering and reshaping human behavior in politics, business, education, and other industries (Hartley et al., 2023; Wang & Ma, 2024). The future of smartphones is expected to feature advancements in artificial intelligence, augmented reality, and improved health-tracking functionalities. Researchers have begun to explore the capabilities of 5G technology, which offers enhanced connectivity and novel applications, such as telemedicine and smart city integration (Ochs & Sauer, 2022; Raj et al., 2023). The review of existing literature indicates that smartphones significantly affect various aspects of life, including social dynamics, mental health, educational practices, and physical well-being (Bhatt & Gaur, 2019). Smartphones offer numerous conveniences. However, current research underscores the necessity of mindful usage to mitigate potential negative effects (Wang & Ma, 2024).

Smartphone Usage and Academic Performance of Students

Various theoretical frameworks have been employed to analyze the correlation between smartphone usage and academic performance. The Technology Acceptance Model (TAM) posits that students' perceptions of the usefulness and ease of use of technology significantly influence their intention to utilize it. According to the TAM, students may view smartphones as advantageous for academic achievement due to their facilitation of access to educational resources, communication with peers and instructors, and improved time management (Ahmed et al., 2020; Zhu et al., 2024). Another theoretical approach is the Distraction Theory proposed by Baron (1986), which asserts that excessive smartphone use for non-academic activities, including social media, gaming, and entertainment, can hinder concentration on academic tasks (Sumuer, 2021). This theory emphasizes the conflict between the ability of smartphones to improve learning and their potential to serve as distractions that negatively impact academic performance.

Furthermore, Bandura's (1986) Self-Regulation Theory illustrates students' capacity to effectively manage their smartphone usage (Bhatt & Gaur, 2019; Liu, 2023). Wang and Ma (2024) assert that Self-Regulation Theory posits that students exhibiting higher self-regulation are more adept at utilizing smartphones for academic objectives while effectively reducing distractions. Understanding the balance between productive and non-productive smartphone use is essential for assessing its impact on academic outcomes. Smartphones offer students exceptional access to a vast array of academic resources. Management Science students can readily access information pertinent to their coursework through educational apps, e-books, online journals, and research databases. Research indicates that smartphones when utilized for academic purposes, improve students' learning experiences by increasing the accessibility of academic materials (Shruthi & Indiramma, 2019). Accessing online libraries, viewing instructional

videos, and participating in academic forums enhance students' comprehension of intricate concepts in fields such as economics, finance, and management theory.

Smartphones enhance communication among students and between students and lecturers. Platforms such as WhatsApp, Zoom, and Google Classroom facilitate collaboration among Management Science students for group assignments, the sharing of study materials, and real-time clarification of doubts with peers and instructors. Additionally, students can obtain prompt feedback from their instructors via emails or instant messaging, thereby improving their academic performance by maintaining alignment with their learning objectives.

Effective time management significantly influences academic achievement. Smartphones offer various tools, including calendar applications, task management software, and reminder notifications, which assist students in organizing their study schedules and managing their time effectively (Hartley et al., 2023; Ibragimov et al., 2023). Setting reminders for upcoming assignments, exams, and study sessions enables students to maintain their academic responsibilities. Consequently, students utilizing smartphones for organizational tasks may achieve enhanced academic performance through improved time management.

Skowronek et al. (2023) argue that distraction is one of the most frequently cited negative effects of smartphone usage on academic performance. Sumuer (2021) added that smartphones provide numerous non-academic functionalities, including social media applications, gaming, and entertainment, which may distract students from their academic pursuits. Frequent notifications from these platforms disrupt students' concentration, diminishing the time allocated to academic tasks and negatively impacting overall academic performance (Shree et al., 2024). This results in superficial information processing and, therefore, suboptimal academic outcomes.

The overuse of smartphones, especially late at night, can result in sleep deprivation, which has a detrimental effect on academic performance. Sleep disruption impairs students' focus during lectures and diminishes their performance in examinations. Smartphone addiction represents an increasing issue among university students. Hashemi et al. (2024) assert that smartphone addiction contributes to academic burnout, resulting in student exhaustion and reduced engagement in their studies. This addiction is fuelled by the persistent urge to monitor notifications, remain informed on social media, or participate in non-academic pursuits. As a result, students allocate less time to studying and more time to phone usage, leading to a decrease in academic performance.

Numerous empirical studies have been undertaken in Nigeria and other nations to investigate the impact of smartphone usage on academic performance. Results of previous studies such as Kadam'manja (2023), Muhammed et al. (2016), Mushtaq (2024), Patil & Dhanawade (2023), and Siyami et al. (2023) indicated that students' academic performance is positively influenced by smartphone usage.

Several interventions have been proposed to mitigate the negative effects of smartphone usage on academic performance. Universities may establish digital literacy programs aimed at instructing students on the effective use of smartphones, focusing on their application for academic objectives rather than recreational activities. These programs may also facilitate self-regulation strategies, prompting students to restrict their engagement in non-academic activities. Universities should consider integrating smartphone-based learning tools into the curriculum to direct students' use of these devices toward productive academic activities. Integrating mobile learning platforms and educational applications into course content may increase the likelihood of students

utilizing smartphones for academic purposes, thereby minimizing the potential for distraction. The impact of smartphone usage on the academic performance of Management Science students in Nigerian universities is complex. Smartphones present potential benefits for learning, communication, and time management; however, improper use may result in distractions, addiction, and a decline in academic performance. The equilibrium between productive and non-productive smartphone usage is primarily contingent upon students' capacity to self-regulate and prioritize academic obligations. Educating students on responsible smartphone usage is essential for maximizing the technology's potential for academic success in Nigerian universities. Using the TAM, the adoption of technology is articulated through perceived ease of use, perceived usefulness, and perceived enjoyment of smartphone usage (Cambra-Fierro et al., 2024).

Hypotheses Development

Perceived Ease of Use and Students' Academic Performance

Perceived ease of use refers to how easy students think it is to use their smartphones (Buabeng-Andoh, 2018). Students find it easy to use their smartphones for school because they have user-friendly interfaces, quick access to academic tools, and apps that are easy to understand (Bhatt & Gaur, 2019; Kosola et al. 2024; Liu, 2023; Raj et al., 2023). Understanding the link between smartphone use and academic success is becoming more important as more students bring their phones to school. Smartphones give students ways to talk to each other, study, and work together (Luo et al., 2024). Smartphones can help students learn by making it easier for them to use online libraries, join talks, and keep track of their schoolwork through educational apps. For example, Google Classroom, Zoom, and e-library sites are all platforms that make it easy for students to use their smartphones for schoolwork. This makes it easy to use, which leads to more involvement and self-directed learning, both of which are important for doing well in university.

However, it is not clear what effect digital devices like smartphones have on how well students do in school. Some studies show that kids with higher PEOU are more likely to use their smartphones in a good way for school, which can help them do better (Ahmed et al., 2020). On the other hand, some opined that the same ease of use can lead to distractions like too much social media use and fun, which hurts students' ability to focus and do well in school. In the end, how students handle their smartphone use affects the link between PEOU and academic success. Individuals who use their devices mostly for school tend to have good results, like getting better grades and being better at managing their time (Eze et al., 2021). On the other hand, students who have trouble controlling their non-academic use may have problems, such as being less productive and doing worse in school (Puspitasari et al., 2023). Legramante et al. (2023) argued that the perceived ease of use of smartphones has a lot of promise to help students do better in school, but they need to be carefully managed to keep them from becoming distractions. Universities can help students use their smartphones more effectively by teaching them digital literacy, promoting useful apps, and supporting balanced usage. This way, students can get the most out of the technology's educational benefits.

H1: Perceived ease of use positively predicted students' academic performance

Perceived Usefulness and Students' Academic Performance

The TAM views perceived usefulness as the degree to which people think that using a certain technology will help them do their jobs better (Bancoro, 2024). What students think about how useful they think computers are in school has a big impact on how they are used to help students learn. Smartphones give students access to e-books, online classes, learning management systems, collaborative platforms, and academic

databases, among other tools and resources that can help them learn (Buabeng-Andoh, 2018). If students think their computers can help them with schoolwork, they are more likely to use them while they study. For example, smartphones make it easy to get to educational material quickly, talk to classmates and teachers clearly, and plan your day with the help of productivity apps. Researchers have found that when students think of their smartphones as useful learning tools, they are more interested in schoolwork and may do better in it (Ma et al., 2017).

However, there are some complicated links between using a smartphone and doing well in school. Wang and Ma (2024) state that perceived usefulness is linked to helpful smartphone use, but too much or non-academic use may have negative effects. Social media, games, and leisure apps can make it hard to focus on schoolwork and cut down on the time spent on it. Also, switching between academic and non-academic apps is an example of multitasking that can hurt cognitive ability and learning outcomes. Researchers have found that students' ability to control their time and use their phones in a meaningful way is just as important as how useful they think the devices are (Raj et al., 2023). Schools can make this better by teaching kids how to use smartphones well and teaching them digital literacy and time management skills. Mobile-friendly academic tools and apps that are meant to cut down on distractions can also help people get more done on their smartphones (Ma et al., 2017). Lastly, how students see their computers as useful tools for school can have a big effect on how well they do in school. Even though these gadgets have a lot of benefits, they need to be used carefully for the best results. With the right help and advice, smartphones can be helpful to students' academic performance.

H2: Perceived usefulness positively predicted students' academic performance

Perceived Enjoyment and Students' Academic Performance

Smartphones are becoming very popular very quickly. This has changed how people, especially students, learn, communicate, and have fun. Among the many psychological factors that affect how people use their smartphones, how much they enjoy using them is a big one (Luo et al., 2024). Ma et al. (2017) assert that perceived enjoyment is how much pleasure, satisfaction, or intrinsic drive people feel while using a smartphone, regardless of how well it works (Legramante et al., 2023). This idea has led to studies looking into how students' use of smartphones for fun affects their academic success, and how those effects can be good or bad (Eze et al., 2021). On the one hand, using smartphones for schoolwork has been shown to improve efficiency. Smartphone apps and online tools make it easier to study, use learning management systems, and work together as a group.

However, there is also evidence of bad effects when computers are mostly used for things other than schoolwork. While social media, entertainment platforms, and online games can be fun, they can also lead to too much screen time, which can cause people to put things off, get distracted, and lose focus. This taking of time away from schoolwork often leads to lower scores and worse performance. Research has shown that a strong sense of happiness can lead to addictive behaviors and problems with time management, which makes students less likely to study or do their homework (Bancoro, 2024). Also, how much you enjoy something may change your ability to control yourself, which is important for doing well in school. When students don't have the self-control to limit their smartphone use to study time and fun activities, they may not do as well in school (Legramante et al., 2023). This is especially worrying because smartphones are made to catch your eye, making it harder for kids to stop doing fun things and concentrate on homework.

To sum up, perceived happiness makes users happier and more motivated, but it has a complicated effect on how well they do in school. When directed toward productive use, smartphones can support academic success, but when enjoyment leads to excessive non-academic use, it can hinder performance. Thus, students need to cultivate self-discipline and time management strategies to strike a healthy balance between enjoyment and academic responsibilities. Buabeng-Andoh (2018) advised that educational administrators and parents can also play a crucial role by guiding students to leverage smartphones constructively, ensuring that enjoyment catalyzes learning rather than a barrier to achievement.

H3: Perceived enjoyment positively predicted students' academic performance.

Conceptual Framework

Figure 1. Conceptual Framework

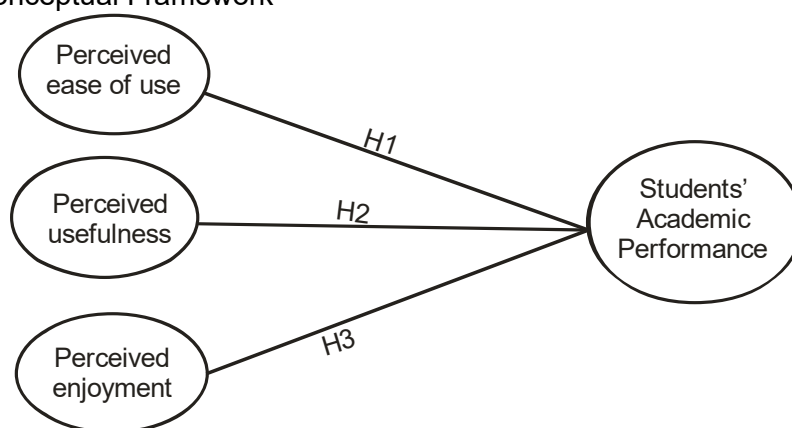


Figure 1 above shows the framework explaining the effect of smartphone usage by management sciences students in the emerging educational economy. The framework shows that perceived ease of use, perceived usefulness, and perceived enjoyment are the driving factors that encourage students to use smartphones.

RESEARCH METHOD

The research design utilized in this study is a cross-sectional survey. A cross-sectional survey is one aspect of survey design that supports using questionnaires to collect data from the participants within the shortest possible time (Sekaran & Bougie, 2016). The study used a validated TAM Instrument developed by Cambra-Fierro et al. (2024) measuring perceived ease of use, perceived usefulness, and perceived enjoyment was adapted to measure smartphone usage. On the one hand, a 16-item validated student academic performance questionnaire by Jabir and Farooq (2022) was used.

A survey was conducted among third-year undergraduate management science students from three state universities in southeastern Nigeria. These students were chosen because of their academic exposure, and a simple random sampling technique was used. The total population included 620 students, and a sample size of 238 was determined using Krejcie and Morgan's (1970) guidelines. Before distributing the survey, researchers obtained consent from both the students and university management regarding participation and the focus on smartphone usage and its impact on performance. Out of the 238 questionnaires distributed, 221 valid responses were collected and used for analysis. The data were analyzed using linear regression to test the research hypotheses with SPSS (version 25.0), while frequency analysis was used to examine the demographic profiles of the respondents.

RESULTS

Table 1. Students Demographic Characteristics

Demographic	Frequency	Percent (%)
Gender		
Female	90	40.7
Male	131	59.3
Age (Years)		
16-20	102	46.2
21 & above	119	53.8
Department		
Accountancy	51	23.1
Banking & Finance	36	16.3
Business Management	64	29
Public Administration	42	19
Marketing	28	12.7

The students' demographic profiles were analyzed and presented in Table 1. The results revealed that 131 students representing 59.3% are males while 90 students representing 40.7% are females. 119 students representing 53.8% fall within 21 years and, 102 students representing 46.2% fall within 16-20 years. 51 students representing 23.1% are in the accountancy department; 36 students representing 16.3% are in the Department of Banking & Finance; 64 students representing 29.0% are in the Department of Business Management; 42 students representing 19.0% are in the Department of Public Administration; and 28 students representing 12.7% are in the Marketing Department.

Table 2. Regression Results

Indicators	R	R ²	Adj. R ²	FStat	Std. Error	TSta	Sig.
PEOU → SAP	0.838	0.702	0.700	515.330	0.034	22.701	0.000
PUSE → SAP	0.865	0.749	0.748	653.121	0.032	25.556	0.000
PENJ → SAP	0.875	0.765	0.764	714.402	0.031	26.728	0.000

Note: PEOU (perceived ease of use), SAP (students' academic performance), PUSE (perceived usefulness), PENJ (perceived enjoyment)

The regression results in Table 2 indicate that the correlation coefficients are in a progressive fit, adequate, and normal (0.838; 0.865; 0.875). It can be deduced from the table that perceived ease of use has a significant effect on students' academic performance (0.838; 515.330 > 3.885). The result of the second research hypothesis indicates that perceived usefulness has a significant effect on student's academic performance (0.865; 653.121 > 3.885). The third hypothesis result revealed that perceived enjoyment has a significant effect on students' academic performance (0.875; 714.402 > 3.885). The overall results show that 71%, 75%, and 77% of the total variations in perceived ease of use, perceived usefulness, and perceived enjoyment can be well explained by students' academic performance.

To ascertain whether there is a sample error, the values of R² and Adjusted R² can be subtracted, and it was observed that the result is less than 5% implying that there is no sample error. All the alternate research hypotheses were accepted because the results of the F statistic were greater than the tabulated value of 3.885.

DISCUSSION

The findings of this study align with previous research on the impact of smartphone usage on students' academic performance, reinforcing the significant role that mobile technology plays in modern education. The significant positive effects observed for perceived ease of use, perceived usefulness, and perceived enjoyment on students' academic performance highlight the importance of smartphones as educational tools when used effectively.

The result regarding perceived ease of use (0.838; 515.330 > 3.885) supports the idea that students who find smartphones easy to use tend to perform better academically. It mirrors Kadam'manja (2023), who found that when students in Malawi found smartphones to be user-friendly, they were more likely to use them for academic purposes, thus enhancing their academic performance. However, Kadam'manja (2023) also highlighted the potential negative impact of smartphone addiction on behavior, leading to distraction and reduced academic engagement. This suggests that while ease of use facilitates academic performance, the challenge lies in preventing overuse or misuse, which could detract from educational outcomes.

Similarly, the perceived usefulness (0.865; 653.121 > 3.885) of smartphones in academic performance corroborates the findings of Muhammed et al. (2016), who emphasized the importance of smartphones as tools for learning, particularly in accessing educational content and communicating with peers and instructors. However, they also caution that excessive smartphone use, especially during classroom time, can be detrimental. This suggests that while smartphones are a useful resource for academic success, their integration into the learning environment should be managed carefully to prevent potential distractions.

The finding on perceived enjoyment (0.875; 714.402 > 3.885) further supports the work of Mushtaq (2024), who found that university students who enjoyed using smartphones for academic purposes showed better performance. This enjoyment likely stems from the entertainment value and ease of access to various learning materials on smartphones, which can enhance motivation and engagement with academic tasks. However, Mushtaq also warned about the downside of excessive enjoyment, which may lead to procrastination or disengagement from important academic tasks, echoing the findings of Patil & Dhanawade (2023) and Siyami et al. (2023), who noted that while smartphones contribute to academic success, they can also foster an environment of distraction if not managed well.

The overall findings that 71%, 75%, and 77% of the variations in perceived ease of use, perceived usefulness, and perceived enjoyment can be explained by students' academic performance suggest that these factors play a crucial role in shaping academic outcomes. This indicates that smartphones, when used for educational purposes, have a strong potential to enhance students' learning experiences. However, it also underscores the importance of balancing smartphone usage with self-discipline and effective management strategies to mitigate potential negative effects.

CONCLUSION

This study aimed to examine the effect of smartphone usage on the academic performance of management science students in Nigerian universities. The findings revealed that students' reliance on smartphones significantly influences their academic performance. Smartphones provide numerous advantages, enabling students to access extensive information and advanced technologies that enhance learning and academic outcomes. However, their impact is not entirely positive and requires careful consideration.

In conclusion, while smartphones contribute positively to academic performance through ease of use, usefulness, and enjoyment, the study emphasizes the need for a balanced approach. Educational institutions and students must recognize both the benefits and challenges associated with smartphone use. This research underscores the importance of implementing strategies to optimize smartphone usage, ensuring it supports academic success while minimizing risks such as overuse, distractions, and addiction.

In developing economies with limited access to traditional educational resources, promoting digital literacy and adopting flexible learning strategies is crucial. Excessive smartphone use for non-academic purposes can hinder academic performance by fostering superficial learning. Future research should explore ways to help students assess the benefits and drawbacks of smartphone use. Educational institutions must also provide guidance on the appropriate academic use of smartphones. Additionally, ensuring affordable internet access in rural areas will enable all Nigerian students to fully leverage smartphones for academic purposes without compromising their performance, thereby bridging the digital divide.

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DECLARATION OF CONFLICTING INTERESTS

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