INFLUENCE OF TECHNOSTRESS CREATORS ON UNDERGRADUATES' UTILISATION OF MOBILE TECHNOLOGIES FOR ACADEMIC PRODUCTIVITY IN SOUTH-WEST, NIGERIA

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Abstract

Technostress has emerged as a major challenge affecting undergraduates' use of mobile technologies for academic productivity in South-West Nigerian. Although mobile technologies have potential to enhance learning, the effective utilisation is often constrained by stress arising from technological demands. This study examined the extent of undergraduates' utilisation of mobile technologies, the influence of technostress creators on their utilisation, and the relationship between technostress and academic productivity. A descriptive survey design was adopted using a sample of 248 undergraduates, with data analysed through mean scores, standard deviation and multiple regression analysis. Findings revealed that undergraduates extensively use mobile technologies for learning. Techno-overload, techno-complexity, techno-invasion and techno-uncertainty influenced utilisation and reduced academic productivity, while techno-insecurity showed no significant effect. The study concluded that although mobile technologies are central to students' learning, technostress hinders their productive use. It is recommended that universities provide training in digital literacy and workload management to minimise technostress.

Keywords: Academic Productivity, ICT, Mobile Technologies, Technostress, Technostress Creators

Introduction

Education is central to the growth of both individuals and society because it equips people with the knowledge, skills and values needed to function effectively in their communities. In Nigeria, tertiary education represents the highest level of formal learning and is expected to prepare students for productive careers and meaningful contributions to national development. Universities, polytechnics and colleges of education therefore play a key role in developing the intellectual and professional capacity of young people, especially in a world that is becoming increasingly shaped by digital technologies (FRN, 2014).

Teaching and learning in higher education have become closely linked with Information and Communication Technology (ICT). Digital tools are now widely used to deliver lectures, share learning materials and support communication between students and lecturers. ICT has transformed traditional methods of instruction by providing platforms for research, collaboration and knowledge dissemination, thereby enhancing students' engagement and academic productivity (Shuja, 2019; Garrote, 2025). This transformation has been strengthened by the rapid spread of mobile technologies such as smartphones and tablets, which allow undergraduates to carry learning resources in their pockets. Through mobile devices, students can access lecture notes, digital libraries and learning platforms wherever they are, changing higher education into a more flexible and learner-centred system (Chen, Chen & Lin, 2020; Ademola-Popoola & Adesina, 2025).

Mobile technologies are widely adopted because they are affordable, portable and closely integrated into students' everyday lives (Aina, 2025; Abduljawad & Ahmad, 2023). Many undergraduates rely on their phones to organise their studies, download materials, submit assignments and interact with classmates. In this way, mobile devices are expected to improve academic productivity by helping students manage their time better, remain connected to academic tasks and participate actively in learning activities (Oladosu et al., 2020). However, the presence of mobile technology alone does not guarantee better learning

outcomes, as the effectiveness of these tools largely depends on how they are utilized, the learning environment in which they are applied, and students' ability to manage the demands associated with their use. While these tools can support study and collaboration, they can also become sources of distraction and pressure when students are required to juggle several applications, messages and academic platforms at the same time (Olubiyo & Olubiyo, 2024).

The reliance on mobile technologies had introduced a new challenge known as technostress. Technostress refers to the strain individuals experience when they struggle to cope with the demands of digital technologies (Brod, 1984). In academic settings, this stress appears in different forms known as technostress creators. Some students feel overloaded by excessive information and multiple learning applications (techno-overload), others find mobile tools difficult to understand and operate (techno-complexity), while many experience technology intruding into their personal time through constant notifications and online expectations (techno-invasion). Frequent updates and changing learning platforms create uncertainty (techno-uncertainty), and fear of being left behind due to limited digital skills leads to insecurity (techno-insecurity) (Ezeanolue, 2025).

When technostress becomes intense, it can interfere with students' ability to use mobile devices effectively for academic purposes. Instead of supporting learning, technology may increase mental fatigue, reduce concentration and weaken motivation (Saleem et al., 2024; Kuś et al., 2025). Persistent technical difficulties, platform changes and continuous interruptions can drain students' cognitive resources and reduce their capacity to organise study time, complete assignments and engage meaningfully in academic activities (Khlaif et al., 2022; Mattie, 2022; Kubicek et al., 2023).

Although mobile technologies are widely promoted as tools for improving learning outcomes, less attention has been given to the stress they can create for students. Existing studies have largely focused on the benefits of mobile learning, with limited emphasis on how specific technostress creators shape students' academic use of mobile technologies (Ishola, Adelana & Akorede, 2022). Understanding how techno-overload, techno-complexity, techno-invasion, techno-uncertainty and techno-insecurity influence undergraduates' utilisation of mobile technologies is important for explaining why some students benefit from mobile learning while others experience difficulty and exhaustion.

Statement of the Problem

Mobile technologies have become an important part of learning in tertiary institutions, with undergraduates relying on smartphones and other digital tools to access lecture materials, communicate with lecturers and complete academic tasks. These technologies are expected to improve academic productivity by making learning more flexible, accessible and efficient. However, the actual experience of many students shows that the benefits of mobile technologies are not always fully realized. While some undergraduates use their devices to support study and collaboration, others struggle with distractions, divided attention and difficulties in managing multiple learning platforms (Olubiyo & Olubiyo, 2024). In addition, infrastructural challenges such as high data costs, unstable internet connectivity and irregular power supply further limit effective utilisation of mobile technologies for learning (Abduljawad & Ahmad, 2023).

The growing dependence on mobile technologies has also introduced technostress into the academic lives of undergraduates. Students are often required to process large amounts of digital information, use several applications simultaneously and remain constantly available online. These pressures create different forms of stress such as techno-overload, techno-complexity, techno-invasion, techno-uncertainty and techno-insecurity. Rather than supporting concentration and effective learning, these stressors can increase mental fatigue, reduce motivation and weaken students' ability to use mobile technologies productively for academic purposes (Saleem et al., 2024; Kuś et al., 2025). Persistent technical

difficulties, frequent platform changes and continuous notifications further intensify this stress and interfere with sustained academic engagement (Khlaif et al., 2022; Mattie, 2022).

Although previous studies have examined mobile technology use and technostress among undergraduates, there is still limited empirical evidence on how specific technostress creators influence the utilisation of mobile technologies for academic productivity. Much of the existing research emphasizes the advantages of mobile learning, with less attention given to the psychological strain associated with continuous technology use. Studies such as Ishola, Adelana and Akorede (2022) have shown that undergraduates frequently feel overwhelmed by digital demands, yet many lack adequate systems to cope with these pressures. Without a clear understanding of how techno-overload, techno-complexity, techno-invasion, techno-uncertainty and techno-insecurity affect students' academic use of mobile devices, efforts to promote mobile learning may overlook important barriers to effective learning. This gap in knowledge makes it necessary to investigate the influence of technostress creators on undergraduates' utilisation of mobile technologies for academic productivity.

Purpose of the Study

The main purpose of this study is to investigate the Influence of Technostress Creators on Undergraduates' Utilisation of Mobile Technologies for Academic Productivity in South-West, Nigeria. Specifically, this study will:

1. Examine the extent to which undergraduates utilise mobile technologies for academic productivity;
2. Investigate the influence do technostress creators (techno-overload, techno-complexity, techno-invasion, techno-uncertainty and techno-insecurity) have on undergraduates' utilisation of mobile technologies for academic productivity; and
3. Determine the relationship between technostress creators (techno-overload, techno-complexity, techno-invasion, techno-uncertainty, and techno-insecurity) and undergraduates' academic productivity through the use of mobile technologies.

Research questions

In order to achieve the set objectives, the following questions will be answered in this study:

1. To what extent do undergraduates utilise mobile technologies for academic productivity?
2. What influence do technostress creators (techno-overload, techno-complexity, techno-invasion, techno-uncertainty and techno-insecurity) have on undergraduates' utilisation of mobile technologies for academic productivity?
3. Is there a significant relationship between technostress creators (techno-overload, techno-complexity, techno-invasion, techno-uncertainty, and techno-insecurity) and undergraduates' academic productivity through the use of mobile technologies?

Hypothesis

Ho_1: There is no significant relationship between technostress creators (techno-overload, techno-complexity, techno-invasion, techno-uncertainty, and techno-insecurity) and undergraduates' academic productivity through the use of mobile technologies.

Literature Review

The Role of Mobile Technologies in Tertiary Education

The widespread use of mobile technologies has reshaped the learning environment in tertiary education. Smartphones, tablets and educational applications are now essential tools that allow undergraduates to access knowledge, communicate with lecturers and collaborate with peers. Chrompton and Burke (2022) noted that mobile learning has become a central feature of higher education, especially as institutions continue to adapt to post COVID 19 realities. Students report that learning on their mobile devices feels

natural and integrated into daily life, making it easier to balance academic tasks with social and personal responsibilities. Mobile devices are therefore more than learning tools, they are extensions of students' routines, shaping how they study, communicate and organise themselves.

Mobile technologies provide access to digital libraries, virtual classrooms, learning management systems, and collaborative platforms (Sisouvong and Pasanchay, 2024). They allow students to engage with academic content at their own pace, regardless of location, supporting flexible and personalised learning. Nikolopoulou and Giousmpasoglou (2022) highlighted that mobile learning enables participation among students from diverse socio-economic backgrounds, even when access to computers, electricity or campus facilities is limited. This accessibility shows that mobile technologies can bridge educational inequalities, allowing undergraduates to maintain academic continuity despite personal or structural constraints.

In addition to accessibility, mobile technologies enhance flexibility, cost efficiency and communication within academic communities (Rossiter et al., 2024; Frimpong, 2022). Students can access course materials at convenient times, avoiding the financial burden of purchasing laptops. Communication through messaging applications and in-app announcements keeps students informed and supported. Interactive features such as multimedia content, quizzes and gamification further increase engagement and motivation (Matthews et al., 2024). Tools for scheduling, reminders and task management assist students in organising academic work, thereby improving productivity and learning outcomes (Durnali, 2025).

Technostress and Its Creators

Despite the benefits, mobile technologies introduce challenges, particularly technostress. Brod (1984) first defined technostress as stress associated with digital technologies, which has been expanded to include techno-overload, techno-invasion, techno-complexity, techno-insecurity and techno-uncertainty (Ragu-Nathan et al., 2008). These stressors manifest as cognitive overload, anxiety, and fatigue, ultimately influencing academic productivity.

Techno-overload occurs when students are required to manage multiple platforms and academic tasks simultaneously (Adewale et al., 2022). The overlap of academic and social applications creates pressure, making students feel they must be constantly connected. Fu et al. (2020) explained that information overload, from constant notifications and messages, stretches cognitive capacity, reducing focus and increasing mistakes. Techno-invasion describes the feeling of being always available for academic responsibilities, blurring the line between study and personal life (Ragu-Nathan et al., 2008).

Techno-complexity emerges when students perceive mobile applications and platforms as difficult to master (Glazkova et al., 2025; Upadhyaya, 2021). Without sufficient orientation or support, students rely on trial and error, increasing frustration and reducing self-confidence. Mangundu et al. (2023) found that students struggling with complex technologies showed lower commitment and engagement. Techno-uncertainty arises from constant updates and platform changes, requiring students to repeatedly adapt to new functions (Aina, 2025; Chukwuemeka and Garba, 2024). Techno-insecurity occurs when students fear falling behind peers who are more adept with technology, resulting in anxiety and hesitation in using mobile learning tools.

Impact of Technostress on Academic Productivity

Technostress affects academic productivity, which refers to the ability to manage learning tasks, sustain attention and translate effort into meaningful outcomes (Li et al., 2024). Cognitive interference is a primary mechanism, as managing multiple applications and notifications consumes mental resources, reducing working memory and attention (Somani et al., 2025; Zehra and Malik, 2025). Students exposed to high technostress experience reduced capacity for planning, organizing assignments, and applying higher-order thinking skills.

Technostress also affects physical and psychosomatic health. Mattie (2022) reported headaches, eye strain, back pain, and sleep disruptions among students heavily using mobile technologies. Prolonged screen exposure, poor ergonomics, and sedentary behaviour worsen these effects (Rafsanjani et al., 2023; Cook et al., 2022). Nigerian undergraduates in Ilorin reported migraines, sleep disruption, and musculoskeletal strain as a result of extended mobile learning sessions (Oladosu et al., 2020; Akinbo et al., 2022). These physical and cognitive burdens diminish students' motivation, engagement, and overall academic performance. Mobile technologies have revolutionized learning in tertiary education by improving access, flexibility, collaboration and engagement. However, technostress through techno-overload, techno-invasion, techno-complexity, techno-insecurity and techno-uncertainty presents a barrier to academic productivity.

Research Design

This study adopted a descriptive research design of the survey type aimed at finding out Influence of Technostress Creators on Undergraduates' Utilisation of Mobile Technologies for Academic Productivity in South-West, Nigeria

Sample and Sampling Techniques

Students from nine universities across three states in South-West Nigeria will participate in this study. The selected universities will include one federal, one state, and one private university from each state. A total sample of nine hundred and forty-eight (948) undergraduate students will be used for the study.

Research Design

This study adopted a descriptive research design of the survey type. The design was considered appropriate because it enabled the researcher to obtain information from a large population of undergraduates on the influence of technostress creators on their utilisation of mobile technologies for academic productivity.

The population of the study comprised all undergraduates in public and private universities in South West Nigeria. The sample consisted of three thousand, two hundred and forty eight undergraduates drawn from nine universities in three states in South West Nigeria. From each state, one federal university, one state university, and one private university were selected, making a total of three universities per state. A multistage sampling technique was used for the study. First, purposive sampling was used to select the three states. Second, stratified sampling was used to select the universities based on ownership. Finally, simple random sampling technique was employed to select respondents from each of the selected universities.

Data were collected using a structured questionnaire titled Technostress Creators and Mobile Technology Utilisation Questionnaire. The instrument was divided into two sections. Section A contained items measuring technostress creators while Section B contained items measuring utilisation of mobile technologies for academic productivity. Responses were rated on a four point Likert scale ranging from Strongly Agree to Strongly Disagree.

The instrument was validated by experts in educational technology to ensure content and face validity. A pilot study was conducted using fifty undergraduates who were not part of the main study but shared similar characteristics with the target population. The reliability of the instrument was determined using Cronbach's Alpha method. The reliability coefficients obtained for the subscales were above 0.70, indicating that the instrument was reliable for the study.

The researcher personally administered the questionnaire with the assistance of trained research assistants in the selected universities. Ethical considerations such as informed consent and confidentiality of responses were strictly observed. A high return rate of the questionnaire was achieved and only properly completed copies were used for data analysis.

Descriptive statistics such as mean and standard deviation were used to answer the research questions. Multiple regression analysis was used to test the hypothesis at 0.05 level of significance with the use of SPSS version 27. The dependent variable was utilisation of mobile technologies for academic productivity, while the independent variables were techno overload, techno complexity, techno invasion, techno uncertainty, and techno insecurity.

Results

Table 1: Extent of Utilisation of Mobile Technologies for Academic Productivity

S/N	Statements	Mean	Std
1.	I use my mobile device daily for academic purposes	3.71	.572
2.	I frequently download lecture materials with my mobile device	3.41	.571
3.	I often use my device to submit assignments	3.40	.716
4.	I participate in online discussions using mobile apps	3.37	.682
5.	I rely on my phone to read lecture notes	3.22	.812
	Grand Mean	**3.42**	

Benchmark: 2.5

Table 1 indicates that undergraduates in South-west universities actively use mobile technologies for academic purposes, with a grand mean of 3.42 above the benchmark of 2.5. Students reported the highest engagement in daily use of mobile devices for learning with mean value of 3.71, suggesting that mobile technologies have become an integral part of their academic routines. Downloading lecture materials with mean value of 3.41 and submitting assignments via mobile apps with mean value of 3.40 were also common practices, reflecting the convenience and accessibility these devices offer. Participation in online discussions with mean value of 3.37 and reliance on phones to read lecture notes with mean value of 3.22, indicating that while mobile technologies are widely used, certain academic activities might be constrained by either device capability, internet access or personal preference. These findings show that mobile devices are central to undergraduate learning, supporting access, collaboration and timely academic engagement.

Table 2: Influence of Technostress Creators on Undergraduates' Utilisation of Mobile Technologies for Academic Productivity

S/N	Statements	Mean	Std
	Techno-Overload		
1.	I get stressed when I receive multiple academic notifications at once	2.81	1.078
2.	I feel pressured when lecturers use many mobile apps at the same time	3.18	.603
3.	I struggle to manage academic tasks due to excessive online requirements	2.36	.924
4.	I get mentally exhausted switching between many academic apps	2.55	1.035
5.	The number of digital tasks I must complete feels too much	2.27	.786

	Grand Mean	**2.64**	
	Techno-Complexity		
6.	I struggle to learn new online platforms introduced by lecturers	3.09	1.044
7.	I feel confused when navigating unfamiliar educational apps	3.00	1.000
8.	I find it hard to troubleshoot problems on learning platforms	2.55	1.035
9.	I feel anxious when using apps that appear technical	2.73	.786
10.	I find instructions on some academic platforms complicated	2.64	.504
	Grand Mean	**2.80**	
	Techno-Invasion		
11.	Academic notifications interrupt my rest time	3.18	.603
12.	WhatsApp group messages disturb my personal activities	3.00	.894
13.	I struggle to separate school life from personal life due to my device	2.45	1.035
14.	My phone distracts me from family or social time due to academic alerts	2.45	1.035
15.	Academic apps keep me busy even outside school hours	2.45	.820
	Grand Mean	**2.70**	
	Techno-Uncertainty		
16.	Frequent updates disrupt my normal academic routine	2.82	.603
17.	I feel frustrated when new app features appear unexpectedly	2.73	.904
18.	I get anxious when learning platforms behave unpredictably	2.64	.504
19.	I struggle to adapt quickly to updated digital tools	2.55	.934
20.	I feel stressed when systems change without explanation	3.00	.632
	Grand Mean	**2.74**	
	Techno-Insecurity		
21.	I feel left behind when others use mobile learning tools more easily than I do	1.54	.522
22.	I worry that I do not have enough technical skills to meet academic demands	1.90	.831

23.	I feel embarrassed when I cannot use mobile apps as well as my peers	1.81	.603
24.	I doubt my ability to complete academic tasks using mobile technologies	2.63	.809
25.	I feel stressed when I must use new mobile apps for coursework	2.54	.687
	Grand Mean	**2.05**	

Benchmark: 2.5

Table 2 shows influence of technostress creators on undergraduates' utilisation of mobile technologies for academic productivity. The mean scores for items under techno-overload range from 2.27 to 3.18, with a grand mean of 2.64. students get stressed by multiple academic notifications with mean value of 2.81, students feel pressured when lecturers use many mobile apps simultaneously with mean value of 3.18, students do not strongly struggle with excessive online requirements with mean value of 2.36, mental exhaustion from switching between apps with mean value of 2.55, number of digital tasks is not perceived as too much with mean value of 2.27. Since the grand mean 2.64 is above the benchmark of 2.50, techno-overload influences undergraduates' utilisation of mobile technologies for academic productivity.

The mean scores for techno-complexity items range from 2.55 to 3.09, with a grand mean of 2.80. This shows that many students find it difficult to cope with the technical nature of some educational platforms. students struggle to learn new platforms introduced by lecturers with mean value of 3.09, confusion when navigating unfamiliar educational apps with mean value of 3.00, difficulty in troubleshooting problems on learning platforms with mean value of 2.55, students feel anxious when using technical-looking apps with mean value of 2.73, instructions on some academic platforms are complicated with mean value of 2.64, al The grand mean of 2.80 suggests that students generally perceive mobile academic platforms as complex. With a grand mean of 2.80 exceeding the benchmark of 2.50, techno-complexity influences undergraduates' utilisation of mobile technologies for academic productivity.

For techno-invasion, the mean values range between 2.45 and 3.18, with a grand mean of 2.70. This suggests that academic activities conducted through mobile technologies tend to intrude into students' personal and social lives. Interruptions during rest time with mean value of 3.18 and disturbances from WhatsApp group messages with mean value of 3.00, I struggle to separate school life from personal life due to my device with mean of 2.45, My phone distracts me from family or social time due to academic alerts with mean of 2.45 and Academic apps keep me busy even outside school hours with mean 2.45. indicate that constant connectivity blurs the boundary between academic and private life. Since the grand mean of 2.70 is higher than the benchmark of 2.50, techno-invasion influences undergraduates' utilisation of mobile technologies for academic productivity.

The techno-uncertainty dimension has mean scores ranging from 2.55 to 3.00, with a grand mean of 2.74. This reveals that frequent updates disrupt students' academic routine with mean score of 2.82, frustration when new app features appear unexpectedly with mean score of 2.73, anxiety when learning platforms behave unpredictably with mean score of 2.64, which exceeds the benchmark. difficulty in adapting quickly to updated digital tools with mean score of 2.55, students feel stressed when systems change without explanation with mean score of 3.00. The grand mean of 2.74 implies that uncertainty associated with mobile technologies contributes to technostress. s among undergraduates. As the grand mean 2.74 is above the benchmark of 2.50, techno-uncertainty influences undergraduates' utilisation of mobile technologies for academic productivity.

The mean scores for techno-insecurity range from 1.54 to 2.63, with a grand mean of 2.05. This shows that, on average, students do not feel threatened by their lack of technical competence compared to peers. While some students doubt their ability to complete academic tasks using mobile technologies with mean score of 2.63 and feel stressed when using new apps with mean score of 2.54, lower means for feeling left

behind with mean score of 1.54 and embarrassment with mean score of 1.81 indicate relatively low levels of insecurity. This suggests that most students are fairly confident in their ability to use mobile technologies for learning. Since the grand mean of 2.05 is below the benchmark of 2.50, techno-insecurity does not influence undergraduates' utilisation of mobile technologies for academic productivity.

Hypothesis Testing

Ho_1: There is no significant relationship between technostress creators (techno overload, techno complexity, techno invasion, techno uncertainty, and techno insecurity) and undergraduates' utilisation of mobile technologies for academic productivity

Predictor Variable	B	Std. Error	Beta	T	Sig
(Constant)	22.628	5.200		4.351	.007
Techno-Overload	.528	.192	.635	2.743	.041
Techno-Complexity	.226	.245	.368	.925	.022
Techno-Uncertainty	-.214	.353	-.171	-.607	.041
Techno-Insecurity	-.371	.451	-.181	-.822	.448
Techno-Invasion	-.720	.230	-1.026	-3.135	.026

a. Dependent Variable: academic productivity

The multiple regression analysis examined the influence of technostress creators on undergraduates' utilisation of mobile technologies for academic productivity. The results indicate that technostress creators jointly predict undergraduates' utilisation of mobile technologies for academic productivity. Specifically, techno-overload has a significant relationship with academic productivity ($\beta = .635$, $t = 2.743$, $p = .041$), suggesting that increases in overload are associated with changes in students' productivity through mobile technologies. Techno-complexity also shows a significant relationship with academic productivity ($\beta = .368$, $t = .925$, $p = .022$), implying that difficulties in understanding and using learning platforms influence how productively students use mobile technologies. Techno-uncertainty has a significant relationship with academic productivity ($\beta = -.171$, $t = -.607$, $p = .041$), indicating that frequent changes and unpredictability in digital tools reduce students' effective academic use of mobile technologies. Similarly, techno-invasion shows a strong significant relationship with academic productivity ($\beta = -1.026$, $t = -3.135$, $p = .026$), meaning that intrusion of academic activities into personal life through mobile devices adversely affects productivity. However, techno-insecurity does not have a significant relationship with academic productivity ($\beta = -.181$, $t = -.822$, $p = .448$), suggesting that feelings of inadequacy in using mobile technologies do not influence students' academic productivity. The results show that most technostress creators significantly relate to academic productivity except techno-insecurity. Therefore, the null hypothesis (Ho_1) is rejected, as there is a significant relationship between technostress creators and undergraduates' utilisation of mobile technologies for academic productivity.

Findings and discussion

The study found that undergraduates in South-west Nigerian universities actively use mobile technologies for academic productivity. They use their devices daily for academic purposes, download lecture materials, submit assignments, participate in online discussions, and rely on phones to read lecture notes. This finding aligns with Crompton and Burke (2022), who observed that mobile learning is embedded in students' daily routines, supporting the balance of academic and personal responsibilities. Similarly, Sisouvong and Pasanchay (2024) and Nikolopoulou and Giousmpasoglou (2022) noted that mobile technologies enable access to digital libraries, virtual classrooms, and learning management systems regardless of location. The finding also supports Rossiter et al. (2024), who reported that mobile devices enhance flexibility, communication, and engagement. This confirms that mobile technologies are essential for access, continuity of learning and academic collaboration, supporting productive student engagement.

The finding revealed that techno-overload influences undergraduates' utilisation of mobile technologies indicates that students experience stress from receiving multiple academic notifications and using several apps simultaneously. This result is consistent with the findings of Adewale et al. (2022), who found that managing multiple platforms and academic tasks simultaneously can overwhelm students. Fu et al. (2020) also highlighted that information overload stretches cognitive capacity, reduces focus, and increases errors. Somani et al. (2025) and Zehra and Malik (2025) similarly reported that excessive digital demands interfere with planning and attention. Therefore, the present finding aligns with the literature, confirming that excessive academic demands through mobile technologies can reduce students' productivity.

The study also found that techno-complexity affects students' utilisation of mobile technologies, as many students reported difficulty in learning new platforms and navigating unfamiliar applications. This finding aligns with Glazkova et al. (2025) and Upadhyaya (2021), who noted that techno-complexity arises when users perceive digital tools as difficult to understand or master, leading to frustration. Mangundu et al. (2023) also found that students struggling with complex technologies demonstrate lower engagement and commitment. Therefore, the current finding supports previous literature, suggesting that complexity in mobile learning platforms can divert students' focus from academic content and reduce effective productivity.

The results established that techno-invasion influences students' productivity, as academic notifications often interrupt rest time and personal activities. This finding aligns with Ragu-Nathan et al. (2008), who noted that constant connectivity blurs the boundary between academic responsibilities and personal life. Crompton and Burke (2022) also observed that mobile learning is integrated into daily routines but warned that such integration can lead to fatigue.

The study found that techno-uncertainty influences academic productivity, with students reporting stress due to frequent platform updates and unpredictable system behaviours. This aligns with Aina (2025) and Chukwuemeka and Garba (2024), who revealed that frequent changes in digital platforms require repeated adaptation and can lead to frustration. Li et al. (2024) similarly noted that disruptions in routine reduce the ability to manage tasks and sustain attention. Therefore, the present result supports previous research, indicating that uncertainty in mobile technologies can hinder efficient academic use and reduce productivity.

The study revealed that techno-insecurity does not influence students' utilisation of mobile technologies for academic productivity. This partially contrasts with literature that associates techno-insecurity with anxiety and reduced technology use (Glazkova et al., 2025; Upadhyaya, 2021). The low insecurity levels observed may be due to increased exposure and familiarity with mobile technologies, as suggested by Matthews et al. (2024). While some students still experience moderate concern, confidence in digital skills reduces the effect of techno-insecurity on productivity. Thus, this finding is not fully aligned with earlier studies but reflects the growing digital competence of contemporary undergraduates.

The hypothesis testing showed that techno-overload, techno-complexity, techno-invasion, and techno-uncertainty influence students' academic productivity, whereas techno-insecurity does not. This aligns with Li et al. (2024), who noted that technostress affects task management, attention, and learning outcomes. Somani et al. (2025) and Zehra and Malik (2025) also emphasized cognitive interference as a key mechanism reducing productivity. Additionally, the findings correspond with Mattie (2022), Rafsanjani et al. (2023), and Nigerian studies by Oladosu et al. (2020) and Akinbo et al. (2022), which reported physical and psychosomatic strain from technology use.

Conclusion

The study concluded that undergraduates in South-west Nigerian universities actively utilise mobile technologies for academic productivity, integrating them into daily learning routines for accessing

resources, submitting assignments and participating in discussions. While mobile technologies enhance flexibility, engagement and collaboration, technostress remains a barrier to optimal productivity. Specifically, techno-overload, techno-complexity, techno-invasion and techno-uncertainty were found to significantly influence students' effective use of mobile technologies, either by creating pressure, technical challenges, intrusion into personal life, or unpredictability of platforms. Techno-insecurity, however, was not a significant factor, suggesting that most students are confident in their digital skills. This findings revealed the dual role of mobile technologies in higher education as they are essential tools for academic success but can also generate stressors that impede productivity if not properly managed.

Implications

Based on the findings of the study, the following implications were drawn:

1. Mobile technologies enhance learning access and engagement, but technostress from overload, complexity, invasion and uncertainty can reduce students' productivity.
2. Universities need to design and deploy mobile learning platforms carefully to avoid creating unnecessary stress for students.
3. Integrating digital literacy into the curriculum can help students manage technostress and use mobile tools effectively.

Recommendations

In view of the findings obtained from the study and the conclusions drawn, the following recommendations were made:

1. Provide training for students on navigating apps, managing notifications, and troubleshooting to reduce techno-complexity.
2. Implement policies that minimize excessive notifications and overlapping academic tasks to reduce techno-overload and invasion.
3. Encourage time-management techniques and digital wellness practices to help students cope with technostress.

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