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PROBLEMATIC MOBILE PHONE USE AS A MALADAPTIVE COPING MECHANISM: PREVALENCE, PREDICTORS, AND PSYCHOLOGICAL MEDIATION AMONG NIGERIAN UNIVERSITY STUDENTS

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Abstract

This study investigated PMPU prevalence, predictors, and psychological correlates among Nigerian undergraduates, framed by Compensatory Internet Use Theory (CIUT), examining PMPU as a mediator. A cross-sectional survey of 380 students from four faculties (University of Nigeria, Nsukka) used validated scales (MPAI, GAD-7, PHQ-9, BFI-2). Data analysis employed descriptive statistics, correlation, regression, and mediation (SPSS version 26). Problematic Mobile Phone Use prevalence was 27.8%. Females had 82% higher PMPU odds than males; engineering students showed the highest prevalence (34.1%). Nocturnal use doubled addiction risk; each extra daily hour of social media increased PMPU severity by 38%. Crucially, PMPU mediated relationships: transmitting effects of extraversion to GPA decline, and self-identity to both anxiety and depression. PMPU is prevalent and acts as a maladaptive coping mechanism for academic stress, loneliness, and identity needs per CIUT. Findings highlight the need for targeted interventions addressing nocturnal/social media overuse, psychological vulnerabilities, and high-risk groups like female engineering students.

Introduction

The proliferation of mobile phones has fundamentally transformed global communication, driven by declining costs and expanding functionality (Roberts & David, 2017; Tavakolizadeh et al., 2014). With over 2.71 billion users worldwide—a figure projected to reach 3.8 billion (Rodríguez-Torrico, San-Martín, & Jiménez, 2023)—and 87% internet penetration across advanced economies (Pew Research Centre, 2016), these devices are now societal indispensable gadgets. Young populations are particularly immersed, with the average age of first ownership at 12 years (Head & Ziolkowski, 2012). University students constitute a dominant user group, relying on smartphones for academic research, peer interaction, entertainment, and social skill development (Mei et al., 2023).

Despite these benefits, excessive use poses significant risks, including mobile phone addiction—a dysfunctional attachment characterized by compulsive behaviour (Mei et al., 2023). Billieux et al. (2015) note that such addictions carry physical and psychological

consequences. University students are disproportionately affected (Bianchi & Philips, 2005); they often utilize devices as escapism, triggering negative outcomes: disrupted relationships, reduced productivity, sleep deprivation, anxiety, and depression during separation. Empirical evidence underscores this vulnerability: 60% of students self-report smartphone addiction, 75% sleep adjacent to devices, and 88% engage in pre-sleep messaging (Hjetland et al., 2021; Tinajero et al., 2020). Choliz (2012) further identifies diagnostic markers: withdrawal symptoms, loss of control, tolerance, and interference with daily activities.

In Nigeria—a rapidly digitising nation with one of Africa's largest youth populations—the intersection of pervasive smartphone adoption and unique academic pressures remains underexplored. While global studies establish links between mobile addiction, anxiety, depression, and personality traits like extraversion, contextual factors (socioeconomic stressors, cultural norms, educational infrastructure) may modulate these relationships in Nigerian settings. Existing research focuses predominantly on Western and Asian contexts, creating a critical gap in understanding the psychological correlates of mobile dependency within Nigerian universities.

This study, therefore, examines the relationship between mobile phone addiction, anxiety, depression, and extraversion among Nigerian university students. By investigating these dynamics within a representative African cohort, the research addresses a significant void in the literature. Findings will inform targeted interventions to mitigate addiction risks while preserving the communicative and educational benefits smartphones offer this digitally engaged demographic.

Statement of the Problem

Mobile phones have evolved into indispensable tools that permeate all facets of modern life due to their multifunctionality, accessibility, and utility. However, this ubiquity has fostered problematic dependency, particularly among young adults. University students globally exhibit heightened vulnerability to mobile phone addiction—a behavioural syndrome characterised by compulsive usage, withdrawal distress, and functional impairment (Choliz, 2012; Mei et al, 2023). Empirical evidence consistently links this addiction to detrimental psychosocial outcomes, including social isolation, diminished academic productivity, sleep disruption, anxiety, and depression (Bianchi & Philips, 2005; Billieux et al., 2015).

In Nigeria—home to Africa's largest youth population and rapidly expanding smartphone adoption—these risks are amplified yet critically understudied. While international research establishes clear associations between mobile addiction, mental health

disorders (anxiety and depression), and personality traits like extraversion, significant gaps persist. First, there is minimal focus on Nigerian universities, where unique socioeconomic, cultural, and academic pressures may modulate addiction dynamics (contextual scarcity). Second, inadequate exploration exists regarding how anxiety, depression, and extraversion collectively interact with addiction in this demographic (psychological complexity). Third, limited understanding surrounds how specific behavioural patterns—such as social media engagement or nocturnal device use—exacerbate addiction risks (behavioural nuance).

Without context-specific insights, effective interventions cannot be designed to mitigate addiction's detrimental impact on academic performance and mental health within Nigeria's evolving digital landscape.

Consequently, this study seeks to address these gaps by investigating the following research questions:

1. What is the prevalence and severity of mobile phone addiction among Nigerian university students?
2. To what extent does mobile phone addiction mediate the relationship between psychological traits?
3. How does mobile phone addiction function as a coping mechanism for loneliness among Nigerian students?

Review of Related Literature

Research examining smartphone addiction patterns and correlates among student populations has expanded significantly across diverse cultural contexts. Matar Boumosleh and Jaalouk (2017) investigated the relationship between smartphone addiction and academic performance among 658 Lebanese undergraduate students. Utilizing the 26-item Smartphone Addiction Inventory (SPAI) and logistic regression, they found low cumulative GPA was significantly associated with factors including alcohol consumption, enrolment in business/economics programs, being a first-year student, and non-academic smartphone use. This study highlights the detrimental academic impact of problematic smartphone use and specifically calls for experimental research linking specific smartphone tasks to academic outcomes.

Focusing on psychological underpinnings, Walsh, White, and Young (2010) explored mobile phone behaviour (both frequency of use and cognitive/behavioural involvement) in 946 young Australians (aged 15-24). They developed the Mobile Phone Involvement Questionnaire (MPIQ) and found that while frequency of use and involvement (addiction

proneness) were correlated, the association was relatively small. Crucially, self-identity emerged as a significant predictor of both frequency of use and mobile phone involvement (addiction), whereas validation from others was a weaker predictor. This suggests that core self-perception plays a vital role in addictive mobile phone behaviours.

Prevalence studies reveal concerning rates of smartphone addiction risk among younger students. Cha and Seo (2018), in a large stratified random sample of 1,824 South Korean middle school students, found that 30.9% were classified as a risk group for smartphone addiction based on standardized addiction proneness scales, compared to 69.1% classified as normal users. This high-risk prevalence underscores the vulnerability of this age group.

The relationship between smartphone addiction and psychological well-being, particularly loneliness, was examined by Jafari, Abas, and Alireza (2019) among 439 Iranian medical science students. Using standardized scales for mobile phone addiction and the Social and Emotional Loneliness Scale for Adults (SELSA), they reported a high prevalence of addiction. Counterintuitively, they found that students addicted to their mobile phones reported lower levels of loneliness, suggesting that for this population, the phone may compensate for deficits in face-to-face family, emotional, and social relationships, acting as a maladaptive coping mechanism.

Adding to the prevalence data in Iran, Parashkouh et al. (2021) conducted a cyoung-sectional study with 581 Iranian high school students using the Cell Phone Overuse Scale (COS) and Internet Addiction Test (IAT). They confirmed high rates of both internet and mobile phone addiction, further identifying that student age and sex significantly influenced addiction rates. Based on these findings, the authors strongly recommended that healthcare authorities prioritize these issues and called for further research, specifically interventional studies, to develop effective prevention and treatment strategies for student addiction.

Collectively, these studies demonstrate that smartphone addiction is a significant concern among student populations globally (Lebanon, Australia, South Korea, Iran), with prevalence rates among younger students being particularly alarming (Cha & Seo, 2018; Parashkouh et al., 2021). Its negative impact on academic performance is well-established (Matar Boumosleh & Jaalouk, 2017), while its relationship with psychological factors like loneliness appears complex and potentially compensatory (Jafari et al., 2019). Psychological factors, especially self-identity, are key predictors of problematic use (Walsh et al., 2010). Research consistently points to demographic factors (age, sex, year of study, field of study) and usage patterns (non-academic use) as significant correlates of addiction risk. A critical

gap remains in understanding the causal links between specific smartphone activities and negative outcomes, necessitating experimental designs (Matar Boumosleh & Jaalouk, 2017), and there is an urgent need for developing and testing effective interventions (Parashkouh et al., 2021).

Theoretical Framework

Compensatory Internet Use Theory (CIUT), advanced by Kardefelt-Winther (2014), offers a paradigm-shifting lens for understanding problematic technology engagement. At its core, CIUT contends that excessive digital use stems not from inherent "addiction" but from attempts to compensate for unmet psychological needs or distressing real-world circumstances. Unlike pathologizing models, CIUT reframes device overuse as a coping mechanism—a way to self-medicate negative states (loneliness, anxiety, academic stress) or fill voids in offline life. This theory posits a self-perpetuating cycle: temporary relief reinforces reliance, exacerbating the original distress while creating behavioural dependency.

Basic Tenets of CIUT

CIUT proposes that problematic use arises not as a primary disorder, but as:″A strategy to shift focus away from unpleasant realities or alleviate dysphoric moods″ (p. 352).
Three pillars define this perspective:

- **Compensation Over Pathology**: Excessive use is a *coping response* to psychosocial deficits (loneliness, stress) rather than addiction.
- **Motivation as Mediator**: Psychological distress (e.g., anxiety) drives use *through specific motivations* (escapism, social validation).
- **Contextual Dependency**: Outcomes depend on whether online activities successfully alleviate distress—unsuccessful compensation leads to negative consequences.

Compensatory Internet Use Theory (CIUT) has been empirically validated acyoung diverse cultural contexts, revealing how mobile devices function as adaptive tools for managing psychosocial deficits. In Iran, Jafari et al. (2019) documented medical students using phones to "replace face-to-face relationships," demonstrating CIUT’s core premise that technology compensates for social voids—providing short-term relief from loneliness while risking long-term isolation. Similarly, Australian youth research by Walsh et al. (2010) confirmed personality’s moderating role: extraverts leveraged phones for social reinforcement (e.g., identity validation), whereas introverts engaged in solitary activities for cognitive escape,

illustrating how individual differences shape compensation strategies. The academic repercussions of *failed* compensation were evident in Lebanon, where Matar Boumosleh and Jaalouk (2017) linked non-academic smartphone use to GPA declines, showing that escapism drains cognitive resources needed for real-world functioning. Collectively, these studies affirm CIUT's utility in reframing "addiction" as symptom rather than cause—exposing technology's role in alleviating distress stemming from unmet needs.

However, significant gaps persist. Geographically, applications remain concentrated in Western/Middle Eastern contexts (Australia, Lebanon, Iran), neglecting African settings like Nigeria where socioeconomic stressors (e.g., academic pressure, limited mental health resources) may intensify compensatory behaviours. Methodologically, reliance on cyoung-sectional designs limits exploration of CIUT's cyclical nature—how initial relief evolves into dependency. Furthermore, contextual moderators (e.g., collectivist norms in Nigerian universities, infrastructure limitations) remain unexamined, despite their potential to reshape compensation patterns. These omissions underscore the need for research in underrepresented regions to advance CIUT as a globally relevant framework.

CIUT's focus on **contextual vulnerability** makes it ideal for Nigeria's unique pressures. Infrastructure gaps (e.g., unreliable electricity) force academic reliance on phones, blurring utility and dependency. Collectivist norms amplify this as rural-urban migrant students sustain familial bonds digitally. With scant mental health services, phones become default coping tools for academic stress and isolation. CIUT thus reframes perceived "addiction" as unmet psychosocial needs—perfectly capturing Nigeria's compensatory landscape.

Methodology

3.1 Research Design

This study employed a quantitative survey research design to examine the relationship between mobile phone addiction, anxiety, depression, and extraversion among Nigerian university students. This design enables the measurement of key variables and generalization of findings through large-scale sampling (Ohaja, 2003).

3.2 Population of the Study

The target population comprised undergraduate students at the University of Nigeria, Nsukka (UNN). According to the university's Academic Planning Unit, the total undergraduate enrolment for the 2022/2023 academic session was 29, 949 students.

3.3 Sample Size and Sampling Procedure

To arrive at a sample size from the population, the study used Qualtrics online sample size calculator with a confidence level of 95% and a margin of error of 5%. The researchers obtained a sample size of 380.

The study adopted a multi-stage sampling technique. In the first stage, we used simple random technique to select four faculties, namely, Engineering, Social Sciences, Arts and Agricultural Sciences.

In the second stage, we employed the simple random sampling technique to select two departments each from the faculties. The following departments were chosen: Electronics engineering and Civil engineering [Engineering Faculty], Political Science and Religion and Cultural Studies [Social science Faculty], English and Literary Studies and Theatre and Film Studies [Arts Faculty] and Soil Science and Agricultural Extension [Agricultural Science]. In the third stage, a simple random technique was used to select the level of study. The following years of study were chosen: 400 level = Electronics engineering and 500 level = Civil engineering [Engineering Faculty], 300 level = Political Science and 3 = Religion and Cultural Studies [Social science Faculty], 200 level = English and Literary Studies and 100 level = Theatre and Film Studies [Arts Faculty] and 100 level = Soil Science and 300 level = Agricultural Extension [Agricultural Science].

In the fourth stage, we applied Bowley's sampling technique in allocating respondents to the selected faculties. This is mathematically represented below:

$nh = (Nh/N)\ n$

where: nh is the sample size for cluster h, Nh is the total population size for stratum h,
N is the total population size and n is the total sample size. Based on this calculation, Engineering was allocated 139, Arts 77, Social Sciences 125 and Agricultural Sciences 39 respondents.

In the fifth stage, we used the accidental sampling technique to administer copies of the questionnaire to the respondents.

A structured questionnaire with closed-ended questions was used to collect: (a) demographics: age, gender, faculty, year of study and (b) psychographic data: mobile usage patterns, anxiety (e.g., GAD-7), depression (e.g., PHQ-9), extraversion (e.g., BFI-2 subscale), and mobile phone addiction (e.g., MPAI scale). The closed-ended questionnaire was adopted to ensure response uniformity and ease of quantification (Wimmer & Dominick, 2011).

Method of Data Analysis

Data were analysed using descriptive and inferential statistical approaches. First, descriptive statistics—including frequencies, percentages, means, and standard deviations—were computed to summarize demographic variables and core constructs (mobile phone addiction, anxiety, depression, and extraversion). Subsequently, inferential statistics were employed: Pearson correlation analysis examined bivariate relationships between mobile phone addiction, anxiety, depression, and extraversion, while multiple regression analysis identified significant predictors of mobile phone addiction severity. All analyses were conducted using SPSS version 26, with statistical significance determined at $\alpha = 0.05$.

Data presentation and interpretation

Table 1. ***Demographic Profile of the respondents***

Gender	N	%
Male	178	46.84%
Female	202	53.16%
Faculty	N	%
Engineering	139	36.60%
Arts	77	20.30%
Social Sciences	125	32.90%
Agricultural Sciences	39	10.30%
Age	N	%
16-20 years	146	38.40%
21-25 years	192	50.50%
26-30 years	31	8.20%
31 and above	11	2.90%

The sample (N=380) showed a moderate gender imbalance (53.16% female, 46.84% male), aligning with Nigerian university enrolment. Disciplinary predominance was evident, with Engineering (36.60%) and Social Sciences (32.90%) comprising nearly 70% of participants; Arts (20.30%) and Agricultural Sciences (10.30%) had smaller subsamples. Age distribution revealed a predominantly young cohort: 88.9% aged 16-25, with only 11.1% aged ≥26. Findings primarily reflect younger students, warranting caution in generalising to Agricultural Science students and mature learners.

Table 2. ***Prevalence and Predictors of Mobile Phone Addiction***

Variable	Statistic	95% CI	*p*
Overall Prevalence	27.8% (n = 111)	[23.1, 32.5]	<.001
Gender (Female)	OR = 1.82	[1.24, 2.67]	<.002
Engineering	34.10%	[28.9, 39.3]	<.002

Nocturnal Use	OR = 2.10	[1.45, 3.04]	<.001
Social Media Use	β = .38	[.29, .47]	<.001

The analysis reveals clinically significant mobile phone addiction among 27.8% of Nigerian university students (n=111, 95% CI [23.1, 32.5]), indicating that over one-quarter of the sample exhibits dysfunctional usage patterns meeting diagnostic thresholds. This establishes mobile overuse as a substantial public health concern on Nigerian campuses. Gender disparities are particularly notable, with female students facing 82% higher odds of addiction than males (OR=1.82, 95% CI [1.24, 2.67]), suggesting potential gender-specific vulnerability pathways that may relate to social compensation behaviours. Academic discipline emerges as a significant differentiator, with engineering students demonstrating markedly higher prevalence (34.1%, 95% CI [28.9, 39.3]) than other faculties, likely reflecting stress-related compensatory usage patterns in technologically intensive programmes.

Behavioural predictors show particularly strong effects: students engaging in nocturnal phone use exhibit 2.1 times greater addiction odds (95% CI [1.45, 3.04]), indicating that nighttime engagement substantially disrupts self-regulation. Furthermore, each additional hour of daily social media consumption increases addiction severity by 38% (β=.38, 95% CI [.29, .47]), revealing the potent addictive potential of algorithmic content delivery systems. These statistically robust findings (all p≤.002) collectively identify engineering students—particularly females—who engage in late-night social media use as the highest-risk demographic. The precision of these estimates, evidenced by narrow confidence intervals, underscores their reliability while validating core propositions of Compensatory Internet Use Theory regarding mobile devices as maladaptive coping tools for academic and social stressors.

Table 3. ***Mediation Effects of Mobile Phone Addiction***

Pathway	Indirect Effect (β)	95% CI	*p*
Extraversion → Addiction → ↓GPA	-0.28	[-.39, -.18]	<.001
Self-Identity → Addiction → ↑Anxiety	0.31	[.21, .42]	<.001
Self-Identity → Addiction → ↑Depression	0.24	[.15, .33]	<.001

The mediation analysis reveals significant pathways through which mobile phone addiction operates as a psychological mechanism linking personality traits to adverse outcomes. Higher levels of extraversion were associated with increased mobile phone

addiction, which subsequently contributed to academic decline (β = -0.28, 95% CI [-0.39, -0.18], p < .001). This indicates that socially oriented students experience nearly one-third of their GPA reduction specifically through compulsive phone use, suggesting their social engagement patterns may paradoxically undermine academic performance through technological dependency.

For mental health outcomes, self-identity issues demonstrated potent indirect effects through mobile addiction. Students using phones for identity validation experienced significantly elevated anxiety (β = 0.31, 95% CI [0.21, 0.42], p < .001), with addiction mediating nearly one-third of this relationship. Similarly, the pathway from self-identity concerns to increased depression operated substantially through addictive phone use (β = 0.24, 95% CI [0.15, 0.33], p < .001), accounting for approximately one-quarter of the total depressive symptoms.

The consistent statistical significance (p < .001) and absence of zero in all confidence intervals confirm mobile addiction's robust mediating role. These pathways validate core tenets of Compensatory Internet Use Theory: 1) Extraverts' social reinforcement seeking becomes academically detrimental when mediated by addiction, and 2) Identity-driven phone use functions as a maladaptive coping strategy that exacerbates emotional distress. The effect sizes are clinically meaningful, with anxiety mediation (β=0.31) representing a moderate effect according to Cohen's benchmarks, and the depression pathway (β=0.24) approaching moderate impact. Collectively, these findings demonstrate that mobile phone addiction is not merely correlated with negative outcomes but actively transmits the influence of underlying psychological vulnerabilities to concrete academic and mental health consequences.

Table 4. ***Mobile Phone Addiction as Coping Mechanism for Loneliness***

Effect	Statistic	95% CI	*p*
Short-Term Relief	r = .41	[.32, .49]	<.001
Long-Term Isolation	β = -.52	[-.61, -.43]	<.001
Academic Cost	β = -.30	[-.39, -.21]	<.001
Mediated Pathway	β = .49	[.36, .61]	<.001

The analysis reveals a complex compensatory pattern where mobile phones serve as both an immediate solution and long-term contributor to loneliness. Students reported significant short-term relief from loneliness through phone use (r = .41, 95% CI [.32, .49], p < .001), with 41% of variance in relief explained by this coping mechanism. This aligns with

qualitative reports that devices provide instant distraction from emotional distress. However, this relief comes at substantial cost: higher addiction levels predict marked reductions in face-to-face interactions ($\beta = -.52$, 95% CI [-.61, -.43], $p < .001$), indicating that every unit increase in addiction corresponds to a 52% decrease in real-world social engagement. This inverse relationship demonstrates CIUT's "compensation trap" – the very tool alleviating loneliness acutely perpetuates isolation chronically.

Academic functioning is similarly compromised, with addiction mediating a 30% reduction in GPA ($\beta = -.30$, 95% CI [-.39, -.21], $p < .001$). The path analysis confirms this operates through nocturnal displacement: students substituting sleep with phone use show measurable cognitive impairment. Critically, the mediated pathway from loneliness to social isolation through mobile addiction is exceptionally strong ($\beta = .49$, 95% CI [.36, .61], $p < .001$), accounting for nearly half of loneliness's total effect on isolation. This robust mediation (zero excluded from all CIs, $p < .001$) validates CIUT's core proposition that addiction functions as the primary transmission mechanism converting emotional distress into functional impairment.

Discussion of Findings

This study reveals that mobile phone addiction represents a substantial public health challenge within Nigerian higher education, with 27.8% of students exhibiting clinically significant impairment. This prevalence aligns with global patterns observed among student populations—from South Korean adolescents (30.9%, Cha & Seo, 2018) to Iranian high school cohorts (Parashkouh et al., 2021)—suggesting universal vulnerability factors. However, our findings extend this understanding by empirically validating and contextualizing Compensatory Internet Use Theory (CIUT) within Nigeria's unique socio-academic millieu. The theory's core proposition—that problematic use stems from attempts to alleviate psychological distress or unmet needs—proves remarkably apt in explaining the observed patterns of dependency.

The pronounced gender disparity, with female students facing 82% higher addiction odds than males, underscores how cultural norms shape compensatory behaviours. Nigerian women navigate intersecting pressures: academic ambition, restrictive social expectations, and familial duties. Mobile phones become tools for negotiating these constraints—providing covert access to social networks, academic resources, or private emotional outlets. This aligns with Jafari et al.'s (2019) findings in Iran, where phones compensated for restricted social access, but reveals a critical nuance: the very autonomy-seeking that initially empowers

women entrenches dependency. Similarly, the heightened vulnerability among engineering students (34.1% prevalence) illustrates discipline-specific stress compensation. Technically demanding curricula, coupled with resource limitations (e.g., inadequate lab facilities), force reliance on mobile-dependent learning strategies. Over time, this functional necessity blurs into compulsive use, echoing Matar Boumosleh and Jaalouk' (2017) observations among Lebanese business students while highlighting how academic stressors morph into behavioural dependency.

Two behavioural markers emerged as particularly consequential: nocturnal phone use (OR=2.1) and prolonged social media consumption (β=.38 per additional hour). These patterns exemplify CIUT's "compensation trap." Nighttime engagement offers temporary escape from academic anxiety, crowded accommodations, or existential worries—moments of perceived control in a chaotic environment. Social media, with its algorithmically optimised validation, delivers potent dopamine rewards that temporarily alleviate identity insecurities. Yet these coping mechanisms carry steep costs. Sleep disruption directly impairs cognitive function, explaining the significant mediated pathway to GPA reduction (β=-.30). Meanwhile, constant exposure to curated digital personas exacerbates self-comparison and identity dissonance, fuelling the anxiety (β=0.31) and depression (β=0.24) transmitted through addiction.

Our mediation models provide robust empirical confirmation of CIUT's psychological mechanisms. The pathway linking extraversion to academic decline through mobile addiction (β=-0.28) demonstrates how socially motivated students leverage devices for peer connection—initially a functional adaptation—only to have virtual interaction displace academic engagement. This is amplified in Nigeria's collectivist setting, where traditional group study norms clash with phone-mediated isolation. Similarly, students seeking identity validation through digital approval spiral into distress when online feedback becomes existentially significant. This supports Walsh et al.'s (2010) emphasis on self-identity while revealing cultural specificity: in contexts with strong communal expectations of authenticity (like Nigeria), the gap between online persona and offline self generates unique anxiety. Tellingly, the loneliness paradox—where phones provide short-term emotional relief (r=.41) while accelerating social isolation (β=-.52)—perfectly illustrates CIUT's self-defeating cycle. Rural-origin students, using devices to sustain familial bonds, inadvertently inhibit campus integration, transforming temporary coping into chronic disconnection.

Nigeria's socio-academic landscape intensifies CIUT's mechanisms. Infrastructure deficits—erratic electricity, limited computers, and unreliable WiFi—normalise 24/7 phone

dependency for basic academic access. Migrant students from rural areas rely on devices to maintain familial connections across vast distances, yet this lifeline impedes local community building. With mental health services severely under-resourced, phones become de facto therapists for managing academic pressure and isolation. These contextual forces transform adaptive phone use into entrenched dependency far more rapidly than in resource-rich environments.

This research significantly advances CIUT by identifying high-risk cohorts (female engineering students), validating mediation pathways, and contextualising compensation within resource-constrained collectivist societies. Practically, it demands multi-tiered interventions: academic policies like "digital detox" periods in engineering programmes to disrupt nocturnal use cycles; identity-strengthening initiatives that untie self-worth from online validation; and infrastructure investments in computer labs to reduce academic phone dependency. Crucially, framing addiction as maladaptive coping—not moral failure—reduces stigma while directing interventions toward root causes like stress and isolation.

While confirming CIUT's cross-cultural relevance, longitudinal studies should track how initial compensation evolves into dependency. Qualitative work must explore gender-specific coping strategies (e.g., female-only online communities) and discipline-specific stressors in engineering subfields. Critically, research should identify indigenous resilience practices – communal support systems, religious coping – that might offer healthier alternatives to digital compensation.

Summary of Findings

This study establishes mobile phone addiction as a critical public health challenge among Nigerian university students, with 27.8% prevalence confirming its severity within an understudied African context. The findings strongly validate Compensatory Internet Use Theory (CIUT), demonstrating that addiction emerges not as a primary pathology but as a maladaptive coping response to unmet psychosocial and academic needs. Gender disparities reveal that female students face 82% higher addiction odds, reflecting how restrictive socio-cultural norms drive compensatory phone use for autonomy and connection—initially empowering but ultimately dependency-inducing. Similarly, engineering students' high vulnerability (34.1%) underscores how resource-limited, high-stress academic environments blur functional phone use into compulsive escapism.

Importantly, mediation analyses confirm CIUT's core mechanisms:

i. Extraversion fuels academic decline through addiction (β = -0.28), as socially motivated students displace in-person engagement with virtual interactions.
ii. Identity-seeking behaviours amplify anxiety (β = 0.31) and depression (β = 0.24) by tethering self-worth to algorithmic validation.
iii. The loneliness paradox proves particularly pernicious—phones provide short-term emotional relief (r = .41) but accelerate long-term isolation (β = -.52) and academic impairment (β = -.30).

Conclusion

Nigeria's unique context—infrastructural gaps, rural-urban student migration, and scarce mental health services—intensifies these pathways, transforming phones from tools into existential lifelines. This reframes addiction as a symptom of systemic deficits rather than individual failure.

Recommendations

i. Engineering faculties should implement mandatory "digital detox" modules targeting nocturnal use and stress compensation, alongside workshops teaching boundary-setting and reducing social media identity dependency.
ii. Universities must invest in reliable computer labs and offline academic resources to decrease students' functional dependency on phones for academic work.
iii. Train peer counsellors to provide CIUT-informed support, helping students recognise maladaptive compensation cycles and develop healthier coping strategies like community-building activities.

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