

## ALWAYS ONLINE, FALLING BEHIND: A REVIEW OF THE CONSEQUENCES OF MOBILE SCREEN AND DATA OVERUSE ON COLLEGE CAMPUSES

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### ABSTRACT

*The academic, psychological, social, and environmental landscape of college campuses have undergone drastic changes owing to the widespread use of mobile phones and the continuous state of data connectivity. This review synthesizes interdisciplinary research to examine the multifaceted impacts of excessive mobile screen and data use among college students. Based on the Cognitive Load Theory, Uses and Gratifications Theory, and Ecological Systems Theory; this paper reveals the toll that excessive use of mobile devices can take on academic studies by levying cognitive load, causing psychological distress due to emotional reliance and sleep disturbance, damaging social life because of digital attachment, and polluting the environment because of data-driven power consumption and e-waste. A feedback loop was identified that alternates between emotional and academic difficulties, contributing to further screen dependency. Although more awareness is being created, the available literature remains limited owing to cultural bias, the methods used, and inadequate attention paid to environmental effects. The paper concludes with an appeal for cross-cultural, long-range, and interdisciplinary studies while simultaneously referencing institutional changes that foster digital well-being, sustainable usage, and balanced campus digital cultures.*

**KEYWORDS:** *Mobile Phone, College Students, Academic Performance, Psychological, Social Interaction, Environmental Impact, Digital Addiction.*

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### Introduction

Mobile phones in the hyper-digital world of today has changed to become multifunctional digital hubs where students are able to access academic content besides networking with other students in real time. At college campuses, smartphones provide the benefits of accessing online lectures, searching and researching databases, virtual libraries, and course management systems. However, while this ubiquity of digital connectivity has its benefits, the excessive and often unconscious use of mobile screens and mobile data has implications for students and educational institutions alike.

Recent reports indicate that students at colleges tend to use mobile devices for an average of 6-8 hours each day, with many also being multitaskers between entertainment, social network content, and academic materials (Twenge et al., 2018). While this might indicate excessive online engagement apart from essential screen time, it is important to gauge the quality of digital content. The longer unstructured use of screens is increasingly associated with low academic performance, as students struggle to concentrate on lectures, exhibit limited memory capacity, and have poor time management skills (Lepp et al., 2015; Kuznekoff & Titsworth, 2013). Besides academic outcomes, classroom environments are frequently disrupted by digital distractions, such as notifications, apps, and psychological and social consequences. Constant looking at mobile screens and social media, in particular, leads to reduced face-to-face communication, social withdrawal, and a sense of loneliness. High levels of anxiety, stress, and depressive symptoms are also associated with high levels of Fear of Missing Out (FOMO), cyberbullying, or comparison culture among college students. In addition, heavy use of screens and late-night viewing interferes with sleeping patterns, thus causing lack of concentration and sleepiness throughout the day whenever studying or in the academic environment (Cain & Gradisar, 2010).

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From an environmental perspective, the consequences of mobile device overuse are often underestimated. Constant charging of devices, heavy mobile data consumption (video streaming and app usage), and Wi-Fi connectivity across campus infrastructure lead to increased energy consumption and carbon emissions. Furthermore, the culture of frequent device upgrades, accessory disposal (chargers and earphones), and improper e-waste management on campuses contributes to growing electronic waste, a serious sustainability issue rarely addressed in higher education policy. Moreover, forced and excessive usage of digital technologies reforms the campus ecosystem, transforming the libraries, classroom, and social space into small working and studying blocks that are less interactive and more fragmented. There can be students present physically but not mentally, establishing a setting that is emotionally detached, reducing the productive education-related interaction, and even friendship connect with other students.

Even though awareness of the adverse effects of mobile screens and data overuse has increased, most current research is somewhat divided, as much of it focuses on academic, psychological, social, or environmental outcomes. It has a deficiency of comprehensive theory-based reviews that combine these varied dimensions in order to comprehend the entirety of the excess of mobile phones on college campuses. To fill this gap, this review synthesizes multidisciplinary evidence to draw an all-round view of the diverse effects of excessive mobile device use among college students. Specifically, the review explores academic disruption (how excessive screen time impairs cognitive function, learning outcomes, and academic performance), social and psychological consequences (the relationship between mobile dependency, emotional well-being, social interaction, and mental health), and environmental implications (the largely overlooked impact of student mobile behavior on data-driven energy consumption, electronic waste, and campus sustainability).

The present review based research paper attempts to draw up practical solutions that can guide all educational stakeholders with behavioral, psychological, educational, and environmental frameworks. The final goal will be to facilitate the creation of healthier, more balanced digital habits and environmentally responsible practices in higher education environments.

### Review of Literature

The surge in mobile technology adoption among university students has redefined how education is accessed, social relationships are maintained, and individuals engage in their environments. Although mobile devices offer clear advantages in terms of flexibility, communication, and information access, the excessive or unregulated use of mobile screens and data has raised growing concerns in multiple domains of student life. This section reviews the scholarly literature across four interrelated themes: academic disruption, psychosocial effects, behavioral health, and environmental implications.

The main aim of this review is to provide an extensive summary of available studies on the impact of too many mobile screens and data use among college students. It investigates the scholastic impact of mobile overuse, particularly on the mental output, attention, and scholarly performance in educational institutions. Moreover, the review considers the social and psychological costs of being over dependent on screens and includes aspects such as anxiety, loneliness, digital fatigue, and a lack of face-to-face communication.

Another goal is to identify the environmental cost of digital consumption that so often escapes attention especially when it comes to energy consumption, e-waste, and the overall ecological student mobile practices. Lastly, the review will seek to convert these revelations into evidence-based suggestions for institutions, specifically in policy-making, campus policies, and even increasing the practice of digital literacy programs that foster healthier and less environmentally damaging mobile phone usage behaviors.

To fulfil these objectives, it is essential to critically examine the existing body of literature across multiple domains—education, psychology, social sciences, and environmental studies. This section provides a review of empirical reports and scholarly values associated with mobile overuse and nominates the reports on a thematic level to include four popular areas: academic performance, psychological well-being, social interaction, and environmental impact. This review attempts to bring these lines of research together to create a unified picture of the prevalent but hardly studied effects of mobile screens and data addiction on college campuses.

- **Academic Disruption and Cognitive Overload:** Various studies have shown a negative correlation between the overuse of mobile phones and academic performance. Lepp et al.

(2015) revealed that students who used their smartphones regularly during classes demonstrated poor GPAs and reported trouble with focusing. According to Kuznekoff and Titsworth (2013), students who fiddled or chatted on their phones or used social media during lectures learned less and were at risk of mental exhaustion. The use of smartphones also promotes superficial learning and operation on multiple fronts, as the capacity to focus on academic material is divided between the corresponding brain and computer processes (Junco, 2012). The shuttling between apps (Notes, WhatsApp, Instagram) leads to a divided attention span, which further leads to decline in academic involvement and a lack of desire to participate in classroom responsibilities (Rosen et al., 2013).

- **Psychosocial and Emotional Effects:** Overuse of screens is a serious issue for the mental health and social behavior of college students. Twenge et al. (2018) state that high screen time was closely associated with greater depression, anxiety, and loneliness rates particularly among young adults. Although social media is intended to bring about connectivity, the opposite seems to happen, as social life leads to passive consumption, social comparison, and fear of missing out (FOMO), which lowers the level of emotional well-being. Moreover, too much digital communication can negatively affect the quality of face-to-face social communication and impair the formation of empathy, trust, and relationships with peers (Uhls et al., 2014). Despite being connected, students become even more isolated, creating a paradox that questions the very assumption that being able to access the digital world is an improvement in social life.
- **Behavioral Health and Sleep Disruption:** Use of a mobile device, especially at the wrong time (overnight), affects circadian rhythms and contributes to sleep disorders, including insomnia and low sleep quality (Cain & Gradisar, 2010). Screen time stimulates exposure to blue light, which inhibits the production of sleep hormones, postpones bedtime, and reduces the duration of sleep. Poor sleep, in turn, affects concentration, memory, mood, and academic performance (Hale and Guan 2015). Digital addiction behaviors, such as compulsive checking, phantom vibrations, and screen dependency, are becoming increasingly common among students. Such tendencies are indicative of a certain technology stress (Ragu-Nathan et al., 2008); that is, students become psychologically strained by the over-consumption of technology.
- **Environmental Implications of Digital Overuse:** While much of the literature focuses on individual impacts, few studies have explored the environmental consequences of mobile overuse. However, available research indicates that excessive mobile data usage and device charging contribute to increased energy consumption on campuses (Hilty & Aebischer, 2015). Data centres and mobile infrastructure supporting high-definition streaming and round the clock connectivity also have substantial carbon footprints. Furthermore, many gadget upgrades and accessories (headphones, chargers) are consumed, contributing to e-waste accumulation. E-waste recycling systems are absent in most campuses, which means that waste disposal is not properly observed and long-term effects on the environment can be detrimental (Forti et al., 2020). Another area that is gaining prominence is digital pollution. The persistence of digital interactions occupies the cognitive capacity of the students with content that has little value, leading them into cognitive overload and making them lose mindful attention, which interacts with the mental and emotional climate of campuses (Fasoli, M., 2021).
- **Educational Value and Responsible Use:** Although it is a very serious concern to be studied, the literature also appreciates the educational value of mobile devices when utilized in a strategic manner. A study conducted by Kukulska-Hulme (2009) focuses on ways of using mobile learning to experience augmented engagement, accessibility, and real-time collaborations. Apps favouring time management, digital note-taking, and interactive material are an advantage to students (Kukulska-Hulme et al., 2023). Nevertheless, they are maximized only in the case of supporting digital literacy training and formal institutional policies.

#### **Theoretical Framework: Understanding Mobile Screen and Data Use on College Campuses**

In synthesizing the existing literature on the academic, social, psychological, and environmental effects of mobile phone overuse among college students, three theoretical perspectives emerged as especially useful for framing and interpreting findings. These frameworks help structure observed relationships and guide future inquiries into the multidimensional consequences of excessive mobile screen exposure and data consumption.

- **Cognitive Load Theory (CLT):** Cognitive Load Theory (Sweller, 2016) posits that human cognitive processing has limited working memory capacity. Excessive mobile phone use, particularly for multitasking or entertainment during academic activities, introduces an extraneous cognitive load that disrupts learning. Within the reviewed literature, several studies have documented how disruptive notifications and social media interactions overload working memory, divided attention reduces comprehension and retention of lecture material, and students exhibit diminished academic performance due to task-switching costs. Thus, CLT provides a cognitive explanation for why screen overuse leads to decreased academic efficacy. This helps unify the findings related to attention, focus, and memory performance in mobile-immersed academic settings.
- **Uses and Gratifications Theory (UGT):** The Uses and Gratifications Theory (Blumler & Katz, 1974) explicates the use of mobile phones as a purposive action, and people utilize gadgets to serve emotional, cognitive, and social desires (Camilleri & Falzon, 2021). The literature consistently shows that students use smartphones for social interaction and connectedness (messaging, social networking), emotional regulation (streaming, memes, gaming), and escaping boredom and managing stress (Kaur et al., 2020). This theory frames excessive use not as purely addictive behavior but as a coping mechanism or self-regulation strategy, i.e., one with unintended negative consequences. The UGT helps interpret findings related to psychological well-being, dependency, and the shifting role of mobile devices in college life.
- **Ecological Systems Theory (EST):** Bronfenbrenner's Ecological Systems Theory (1979) emphasizes the layered nature of environmental influence on behavior. Applying EST to mobile screen use allows scholars to view the issue not solely as an individual problem, but as one embedded in microsystems (campus life, peer groups, classroom interactions where excessive phone use affects relationships, engagement, and participation), mesosystems (interactions between domains such as how digital use at night disrupts sleep and in turn impairs academic functioning), and exosystems and macrosystems (institutional Wi-Fi policies, edtech adoption, and broader cultural acceptance of screen time). EST offers a contextual framework for environmental and systemic impacts, helping link psychological effects to institutional and cultural environments, including the growing carbon footprint of digital lifestyles (Fulantelli et al., 2021).

Collectively, these frameworks create a multi-level perspective through which one can study the existing literature. CLT highlights cognitive constraints and disturbances in the classroom, UGT concentrates on gratifications and motivations that determine a pattern of usage, whereas EST describes larger environmental and institutional environments affecting behavior. Such theoretical triangulation enables us to comprehend the issue of excess mobile use by students in view of what is happening, why, and under what circumstances.

All frameworks bring a unique but complementary focus to the picture. CLT focuses on the importance of individual cognition, a fact that serves to describe how multitasking and constant digital distractions harm academic concentration and limit meaningful learning. The interests of UGT concern how individuals become motivated and the perspectives shed light on why students devote much time to their devices even when their actions may be compulsive since it is about satisfying their emotional and social needs. EST, in contrast, amplifies the analysis to a more general environmental and institutional level, where it demonstrates that all the campus norms, the people around, how they behave, and the digital infrastructures; all of them supporting overuse. When synthesized, these frameworks enable a more holistic understanding – *academically*, mobile use creates cognitive overload (CLT); *psychologically*, it provides short-term gratification but fosters dependency (UGT) (Şahin et al., 2024); *socially*, it alters interaction patterns and reshapes campus culture (UGT and EST); and *environmentally*, it contributes to energy consumption and e-waste within systems that normalize constant connectivity (EST). This theoretical integration supports a multifaceted analysis of the causes and consequences of mobile device overuse in higher education settings.

### Synthesis and Discussion

The increasing ubiquity of mobile phones and pervasive data connectivity on college campuses has generated a complex set of outcomes that are beneficial but deeply concerning. The preceding sections explored this issue across four major dimensions: academic, psychological, social, and environmental. This synthesis and general discussion section synthesizes these findings, views them through theoretical perspectives, and considers their implications in the broader context of students, institutions, and society at large.

- **Interconnected Impacts of Excessive Mobile Use:** The most appealing evidence found in the literature is defined by the fact that the effects of excessive mobile use are intertwined rather than isolated. Academic performance is hampered not only due to direct distraction, but also by the indirect effects of inadequate sleep (caused by psychological use) and lack of classroom interaction (caused by social disengagement). Psychological distress, such as anxiety or FOMO, is compounded by social comparison and dependency on constant connectivity, which in turn drives compulsive phone use during study or rest periods. Social consequences, including phubbing and reduced empathy, diminish the quality of interpersonal relationships, weaken the campus community fabric, and contribute to loneliness and emotional fatigue. The indirect effects of uncontrolled digital consumption are environmental costs in the form of e-waste and excessive energy use due to data consumption, which are hardly ever recognized in student behavior, and this shows a large gap in attitude and awareness. Therefore, the result is a feedback cycle in which the overconsumption of mobile devices contributes to academic and emotional problems, which are inadvertently addressed using more applications, resulting in a pattern of dependency and deterioration.
- **Theoretical Integration Revisited:** The theories applied in this review offer not only compartmentalized explanations but also opportunities for integrative thinking. Cognitive Load explains the *academic and mental exhaustion* that comes from frequent task-switching and information overload, reinforcing why screen time hurts learning even without “misuse.” Uses and Gratifications Theory highlights the psychological and emotional factors that keep students tied to their screens and reframes excessive use of digital devices as intentional but mostly naive coping behavior (Mazumdar, A. 2025). Ecological Systems Theory expands the view to *contextual and systemic factors*, from institutional Wi-Fi policies to cultural norms about technology, which help sustain high screen exposure and normalize overconsumption (Büchi et al., 2019).

The collective insights suggest that interventions must occur at multiple levels: not just targeting individual behavior, but also redesigning educational, social, and infrastructural environments to foster healthier digital habits.

- **Institutional and Cultural Blind Spots:** One conclusion is that colleges and universities often underestimate or ignore the systemic nature of digital overuse. Many institutions can encourage digital learning without instilling digital literacy or its parameters and expect that students will control it by themselves. There is a tendency to speak through the culturally dependent language of being tech savvy, in which using more of these devices is seen as synonymous with being competent, without considering the cost and benefit analyses of convenience and cognitive health. Environmental implication of digital behavior is not recognised in campus sustainability policies, even as the costs of digital infrastructure are increasing and carbon footprints are on the rise. These concerns necessitate the need of institutional policy alteration, not only based on the indices of technology adoption but also on additional indicators such as well-being, societal participation, and environmental care.
- **Digital use from Tools to Traps:** The key to this problem rests in a paradox between mobile phones as an instrument of productivity, learning, and connectivity, and mobile phones as an intervener, manifesting distraction, dependency, and disengagement. Recent experiences among students have indicated that the boundary between the two has even been blurred. This poses very deep questions to teachers and policymakers:
  - Do we equip students towards the responsible use of digital tools or do we allow them to over digitize themselves under the illusion of progress?
  - Is digital hygiene fully understood, or has the trend toward habitual mobile dependency blurred the requirement to be restrained?
  - What are the ways to empower students to take charge of their digital life without being deprived or isolated from their social networks?

These questions draw the attention for new pedagogies, policies, and cultural discourses of balance, intentionality, and well-being as the locus of the digital experience.

- **Toward a Balanced Digital Culture on Campuses:** The synthesis of findings suggests that a balanced digital culture must become a central goal for higher education institutions. It involves

embedding digital wellness education in orientation programs and curricula, promoting “tech-free” zones or hours in libraries, hostels, and classrooms. This will encourage face-to-face engagement through events, peer mentoring, and campus communities, and educating students about the carbon cost of data usage, integrating digital sustainability into green campus initiatives. Only through a coordinated and multilevel approach, institutions can move from reactive concerns about mobile overuse to the proactive cultivation of healthier digital habits.

### Implications

The synthesis of the literature and theoretical insights presented in this review points toward a growing concern over excessive mobile screen and data use among college students. The implications are extensive in terms of policy, practice, pedagogy, infrastructure, and research. As a response, educators, institutions, mental health experts, environmental activists, and students should work together to create a healthier and more sustainable digital culture on campuses.

- **Implications for Educational Institutions:** A major way of curbing the increasing menace of mobile overuse among college students is to incorporate digital literacy into the learning and orientation courses of these institutions. This will not only entail imparting technical skills but also the focus on digital wellness, accountable use of mobile devices, and media-specific critical literacies that respond to the cognitive, emotional, and social aspects of digital action. The intentional use of technology can also be promoted by the creation of tech-free zones and organized digital spaces in classrooms, libraries, and student centres. Having device-free time during study time can also boost the concentration of students, encourage face-to-face communication, and minimize digital addiction. In addition, learning analytics tools can also be used by institutions to track the screen usage of students and provide personal feedback, thus helping students develop higher self-awareness and self-regulation. All of this helps create a more conscious, attentive, and digitally balanced campus.
- **Implications for Students and Campus Life:** At the student level, specific interventions should be used to ensure a healthier digital culture on college campuses. An efficient solution is to extend the role of student-led movements that encourage digital mindfulness, including digital detox drives, sensitization programs, and physical interaction activities. Such initiatives are most easily approached when they arise out of peer group initiatives rather than on the directive of administrators because students are more likely to react favourably to initiatives offered by peers. In addition, the list of problems that should be addressed by college counselling centres should be extended to mobile dependency and the related sleep disruptions, anxiety, and attention deficits, which should be treated with the same level of sensitivity as substance use or game addiction. Finally, the establishment of a rich social life on the offline campus through a direct extracurricular activity, organized as clubs, sports, and activities with the people outside the campus, which will reduce the passive screen time significantly. The programs can help in enhancing well-being as well as recover valuable and in-person interactions that are needed for building emotional resilience and a favourable academic environment.
- **Implications for Policy and Sustainability:** To provide a solution to the wider institutional and environmental aspects of the careless use of mobiles, colleges and universities should develop an all-around digital policy that involves equal access and deliberate restriction. This consists of drawing definite limits on unnecessary mobile usage during teaching periods and the potential control of amusement streaming services via campus Wi-Fi to limit distraction and data overuse. In addition to usage policies, institutions ought to incorporate sustainability into their digital plans by creating awareness of the unknown environmental leaks of mobile consumption, such as energy-intensive data servers and increasing e-waste. This, coupled with connecting the issues with sustainability agendas in the campuses, can nurture an ecologically aware student population. In addition, procurement and lifecycle planning must focus on energy-efficient digital facilities, the availability of suitable forms of e-waste management, and educational campaigns on sustainable use, upgrades, and device disposal. These efforts aim to promote a culture of digital responsibility that is not only academically acceptable but also environmentally sustainable.
- **Implications for Future Research:** Future research must address key gaps in the current understanding of excessive mobile screen and data use by adopting more diverse, longitudinal, and interdisciplinary approaches. To begin with, the study of mobile technology within the context of non-western culture is urgently needed, especially in a high-tech digitizing economies like India,

in which young people are widely involved in using mobile technology, yet this group remains underrepresented in research. Such contexts featuring culturally based research may, in turn, provide more refined data on socio-educational forces contributing to mobile use practices. Second, this study needs to focus on how mobile devices lead to academic, psychological, and social consequences by conducting longitudinal and mixed-method studies to detect the future long-run effects of mobile overuse during various phases of college life. This would be better approached through an interdisciplinary approach that covers a wide range of disciplines, including psychology, education, sociology, and environmental science, to measure all the effects. Finally, more support should be given to protective and resilience factors in the form of mindfulness practices, time management skills, and peer support systems that can help reduce the adverse impacts of excessive mobile use and promote the digital well-being of students.

### Conclusion

This review is a critical analysis of the multi-dimensional effects of overuse of cell phone screen time and data on college students with regard to academic, psychological, social, and ecological impacts. The paper is based on three major theoretical approaches to knowledge: Cognitive Load Theory, Uses and Gratifications Theory, and Ecological Systems Theory. This study synthesized findings from across disciplines to present a comprehensive understanding of how mobile overuse functions as both a symptom and driver of broader student challenges. Whereas the culture of overuse of mobile phones is highly normalized in digital-savvy university subcultures, it has been demonstrated to interfere with the study process, lower emotional satisfaction, insult interplays, and cause the creation of invisibly damaged surroundings. These impacts, although not in isolation, are reinforcing, creating a complicated feedback loop where dependence and low performance continue to occur (Mazumdar, 2025; Wang et al., 2023).

The theoretical combination emphasizes that one should consider mobile use as a systemic and contextual process rather than an individual problematic behavioral aspect; the integration sheds light on defining it as a process that is suitable to institutional norms, technological infrastructure, emotional needs, and environmental ignorance. This awareness requires multilevel measures that entail curriculum changes, student-generated digital wellness programming, university-wide sustainability education, and policy innovation. With campuses that have become more digitized, it is not pertinent to eradicate technology but to humanize and harmonize. This ensures that mobile phones are used as a means of empowerment, not the causes of distractedness and distress. With the help of a balanced digital culture, institutions will help not only to make students prosper and thrive in their studies but also contribute to a more socially and ecologically aware educational enclave.

### Limitations and Future Directions

This review highlights some limitations of the available literature regarding the excessive use of mobile screens and data among college students. The most significant fact is that studies are strongly oriented to western settings, and, in many cases, disregard the environmental aspect of mobile overuse. It also lacks interdisciplinary integration, and there are minimal evaluations of effective interventions. To overcome such gaps, the inclusion of longitudinal and mixed-methodological studies, comparison of cultures, cross-cultural analysis, and further theoretical frameworks will be suggested in future studies. Due consideration should be given to other protective factors that may assist digital self-control, measurement of the environmental impact through mobile use, and evaluation of institutional measures such as education of wellness in digital learning and changes in policies. Such guidelines will help create a more comprehensive and oriented context definition of mobile overuse and enable more efficient reactions at both personal and institutional levels.

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