Digital Technology, Problematic Use, and Socio-Economic Consequences Among University Students

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Abstract: University students nowadays are surrounded by digital technologies that are instantaneously enabling and destabilizing. Despite extensive recognition that extreme and poorly regulated technology use is linked to reduced academic performance and psychological distress, its socio-economic dimensions remain poorly understood. This paper examines the relationship between problematic use of digital technology, behavioral outcomes, and socio-economic consequences among university students in Bengaluru, India. An illustration of a systematic literature review of over 80 peer-reviewed studies, grounded in Digital Addiction Theory, Bourdieu's Capital Theory, and the Technology Acceptance Model, develops an integrative conceptual framework that connects antecedent socio-economic conditions to downstream academic and economic outcomes through the mediating construct of problematic digital use. Findings from the literature reveal that low-SES students are unreasonably vulnerable to compulsive digital use and more deficient in productive digital skills, a double disadvantage that is likely to be amplified by AI-driven job displacement. This paper presents a novel integrated framework and proposes a two-phase empirical agenda for future research, with direct implications for the implementation of NEP 2020 and digital equity policy in India.

Keywords: Problematic Digital Use; Socio-Economic Inequality; Digital Addiction; Higher Education; Digital Skills; India

Introduction

Digital devices are ubiquitous at the university level; students use smartphones, social media applications, and online spaces for communication, studying, socialization, and economic opportunities. In fact, more than 5.4 billion people use the internet worldwide, and university students are among the most digitally immersed in this vast user base [1]. Although access to technology in India has increased considerably following the surge in low-cost data packages, the socio-economic impact of this trend is uneven and, to some extent, troublesome.

In fact, all scientific literature proves that uncontrolled and excessive use of digital devices is connected with poor academic performance, increased stress, and even addiction issues among young people [2]. However, most of the existing research considers digital addiction from the perspective of behavioral change, i.e., as a purely psychological issue. The question of who suffers from overuse of digital devices and why they suffer remains understudied compared to the amount of time spent online.

The current paper intends to fill this gap. The problem of digital use is discussed in a socio-economic context where we demonstrate how it serves as a means of reinforcing existing social inequalities in the age of rapid automation and artificial intelligence transformations in the Indian labour market. The contribution of the current study is an integrative theoretical framework and a research agenda for India's higher education system that are relevant to both NEP 2020 and SDGs 4 and 10.

Related Work

Existing research on students' use of digital technology broadly falls into four streams. The first focuses on behavioral patterns and screen time. Przybylski and Weinstein [3] found that excessive smartphone use exhibits a curvilinear relationship with well-being, with moderate use yielding minor benefits but high use producing measurable harms. Twenge et al. [4] documented significant correlations between heavy social media use and declining mental health indicators, particularly among young women. These studies, while rigorous, rely almost exclusively on self-reported screen time as their primary measure and do not account for socio-economic context.

The second stream addresses psychological outcomes. Kuss and Griffiths [2] conducted a comprehensive review of internet and gaming addiction literature, identifying robust associations between compulsive digital use and depression, anxiety, and impulsivity. Their framework draws on Griffiths' components model of addiction [5], which defines addiction through criteria such as salience, mood modification, tolerance, and withdrawal, criteria now widely applied to smartphone and social media use.

The third stream concerns digital inequality. Van Dijk [6] moved the conversation beyond the "first digital divide" (access) to the "second digital divide" (skills and quality of use), demonstrating that digital capital, like Bourdieu's social and cultural capital, is distributed unequally across socio-economic strata. Helsper [7] extended this by showing that digitally disadvantaged individuals face compounding offline disadvantages, making technology inequity both a symptom and a cause of broader social exclusion. Despite these rich theoretical developments, no study has empirically examined how digital inequality interacts specifically with problematic use in the Indian university context.

The fourth stream looks at technology's educational and economic consequences. Junco [8] found that Facebook use during academic tasks was a strong predictor of lower GPA, while the OECD [1] documented that ICT outcomes in education depend not only on access but also on the quality and purposefulness of use. Table 1 summaries the key dimensions addressed by representative prior studies and maps them against the constructs central to the present paper.

Table 1. Comparison of prior studies across constructs addressed in this work

Study	Focus	SES Context	Digital Skills	Econ. Outcome	India Focus

Przybylski & Weinstein [3]	Screen time & wellbeing	No	No	No	No
Kuss & Griffiths [2]	Internet & gaming addiction	No	No	No	No
Van Dijk [6]	Digital divide & capital	Yes	Yes	Partial	No
Junco [8]	Social media & GPA	No	No	Yes	No
This Work	Integrated: PDU, SES, skills, econ.	Yes	Yes	Yes	Yes

Key Contribution

The main contribution of this paper is a new integrative framework that sort of ties together three previously siloed areas of work: digital addiction research, digital inequality theory, and the economics of education into one multidimensional model. Many earlier frameworks address only one or two of those, and here the claim is that you really have to consider all three at once to grasp the broader socio-economic fallout of problematic digital use. A second point is a clearer conceptual separation between compulsive digital use and productive digital skills. In much of the existing work, they're often conflated, as if "more digital engagement" equals "more competence." This paper argues, and the empirical agenda we outline will test, that they are orthogonal constructs. So, a student who spends ten hours a day on a smartphone is not automatically building the information literacy, communication, or problem-solving skills that employers and higher education systems typically expect. That separation becomes even more relevant as AI-driven labor markets continue to transform, because routine cognitive work is being automated more and more, while the value of advanced digital skills is rising rapidly.[9].

Third, this paper provides the first systematic review-based mapping of problematic digital use and its socio-economic dimensions specifically for the Indian higher education context, responding directly to the gap identified by multiple scholars [6][7] regarding the underrepresentation of Global South contexts in digital inequality research.

Method and Results

Systematic Literature Review Protocol

The review followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol, even if it was a bit strict. They searched five databases: Scopus, Web of Science, JSTOR, ScienceDirect, and Google Scholar. The search terms included "problematic digital use," "smartphone addiction," "digital inequality," "socio-economic outcomes," and "ICT and higher education." Records were kept in peer-reviewed journals published between 2010 and 2026 and written in English. First, there was an initial set of roughly 450 records; it was reduced to 80 articles after sequential title and abstract screening, eligibility checks, and final full-text review. Then the articles were coded based on which construct was addressed, which methodology was used, which population was studied, and which country was in focus.

The Integrative Framework: Structure and Logic

The framework proposed here organizes the field into three layers. The first layer captures antecedent conditions: socio-economic background (family income, parental education, urban or rural location), digital access and infrastructure quality, and baseline digital skills. The second layer identifies Problematic Digital Use (PDU) as the core mediating construct, operationalized through validated instruments such as the Smartphone Addiction Scale–Short Version (SAS-SV) and the Internet Addiction Test (IAT). The third layer captures downstream outcomes: behavioral patterns (impulsivity, compulsive checking), psychological states (anxiety, stress, diminished well-being), and ultimately, academic and socio-economic consequences, including reduced GPA, lower employability, and heightened vulnerability to AI-driven job displacement.

Crucially, the framework identifies a bidirectional relationship between SES and PDU vulnerability. Students from lower socio-economic backgrounds are more likely to engage in compulsive digital use, partly because they lack the structured academic environments, extracurricular resources, and parental guidance that buffer against it, while also being less likely to develop the productive digital skills that higher SES peers acquire through access to better devices, faster internet, and more educationally purposive usage habits. This double disadvantage is the paper's essential empirical claim and the primary hypothesis to be tested in the planned primary study.

SLR Findings: Patterns Across the Literature

Three robust findings emerge across the reviewed literature. First, SES is consistently underspecified as a variable: fewer than 15% of the 80 articles in our corpus explicitly measure or control for family income or parental education when studying digital use outcomes. Second, the distinction between time spent online and digital skill level is rarely made: studies almost universally use screen time or usage frequency as their independent variable rather than a validated measure of skill competence. Third, economic outcomes, employability, income potential, and labor market readiness appear in fewer than 8% of reviewed studies, suggesting

that research has focused heavily on academic and psychological outcomes at the expense of longer-term economic consequences. These findings, taken together, suggest that the literature has systematically understudied precisely the intersection that matters most for policy: the relationship between where a student comes from economically, how they use digital technology, and where they end up occupationally. Addressing this intersection is the task this paper and the associated empirical research agenda take on.

Discussions

The framework and SLR findings presented here carry several important implications. First, the interventions intended to reduce problematic digital use that focus solely on individual behavior change are unlikely to be effective for the most vulnerable student populations. A student from a low-income family whose household relies on a shared, low-quality smartphone for all digital activity looks at structural constraints that no awareness campaign or screen-time app can address. Meaningful intervention requires addressing the socio-economic antecedents of problematic use, not just its symptoms.

Second, the AI dimension heightens the urgency of the skills gap argument. McKinsey's analysis of the Indian labour market suggests that approximately 69% of existing jobs face high automation risk [9]. As AI displaces routine cognitive tasks, the employees who will fare best are those with strong advanced digital competencies, precisely the skills that obsessive digital use crowds out. University students who graduate having spent four years using their devices mainly for entertainment and passive social media consumption may find themselves poorly positioned in a labor market that demands digital creativity, data literacy, and adaptive problem-solving.

Third, the findings bear directly on India's NEP 2020 digital pedagogy mandate [10]. The policy envisions a digitally fluent graduate workforce, but its implementation has focused heavily on access, providing devices and connectivity, rather than on the quality and purpose of digital use. Also suggests that access to digital technologies without structured digital skills development may unintentionally increase vulnerability to problematic use, particularly among first-generation college students from lower socio-economic backgrounds who lack informal digital mentorship at home.

Conclusions

Existing research on problematic digital use has treated it primarily as a psychological phenomenon, largely ignoring the socio-economic conditions that shape vulnerability and the economic consequences that follow. This paper addressed that gap directly.A PRISMA-guided systematic literature review of 80+ peer-reviewed studies was conducted, covering digital addiction, digital inequality, and education economics literature. From this review, an integrative multidimensional framework was developed. The literature systematically underspecifies SES as a variable, conflates screen time with digital skill, and neglects long-term economic outcomes. Low-SES students face a double disadvantage: greater vulnerability to PDU and lower levels of

productive digital skills. In an AI-driven economy, this double disadvantage is likely to translate into deepened labor market exclusion. Future work should also consider longitudinal designs that track the labor market trajectories of graduates with varying digital use and skill profiles.

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