

Impact of Smartphone Multitasking on Self-Reported Attention and Memory Difficulties among Indian Undergraduate Students

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Abstract: Smartphones have become an indispensable part of undergraduate students' academic and personal lives. While they provide convenient access to educational resources and communication platforms, frequent multitasking with smartphones during academic activities may be associated with cognitive challenges. The present study examined the relationship between smartphone multitasking and self-reported attention difficulties and self-reported memory difficulties among Indian undergraduate students. A quantitative cross-sectional correlational design was employed. Data were collected from 154 undergraduate students aged 18–24 years using a structured online questionnaire consisting of demographic questions, a Smartphone Multitasking Scale, a Self-Reported Attention Difficulties Scale, and a Self-Reported Memory Difficulties Scale. Statistical analyses included descriptive statistics, reliability analysis, Pearson's Product-Moment Correlation, independent-samples *t*-tests, and one-way Analysis of Variance (ANOVA). The findings demonstrated a significant positive relationship between smartphone multitasking and self-reported attention difficulties ($r = .772, p < .001$). A significant positive relationship was also observed between smartphone multitasking and self-reported memory difficulties ($r = .659, p < .001$). No statistically significant differences were identified across gender or academic year. The findings suggest that greater engagement in smartphone multitasking is associated with increased self-reported attention and memory difficulties among undergraduate students. Although causal conclusions cannot be drawn, the study contributes to the growing literature on digital behaviour and cognitive functioning and highlights the importance of promoting healthy smartphone use during academic activities.

Keywords: Smartphone multitasking, attention, memory, undergraduate students, cognition, digital behaviour

1. Introduction

Smartphones have transformed communication, education, and information access worldwide. Among university students, smartphones are extensively used for attending online classes, accessing learning materials, communicating with peers and faculty members, conducting academic research, and managing educational responsibilities (Chen & Yan, 2016). Their multifunctionality has made them valuable educational tools; however, continuous access to social networking applications, messaging platforms, and entertainment media has also encouraged multitasking during learning activities.

Smartphone multitasking refers to engaging with smartphone-related activities while simultaneously performing another task, particularly academic work. Although students frequently perceive multitasking as an efficient strategy for managing competing responsibilities, cognitive psychology suggests that individuals generally alternate their attention between tasks rather than processing multiple complex tasks simultaneously. Such task switching may increase cognitive load and reduce attentional efficiency (Sweller, 1988).

Attention and memory are fundamental cognitive processes supporting successful learning. Frequent interruptions during academic activities may reduce sustained attention and interfere with information encoding, thereby contributing to perceived memory difficulties (Baddeley, 2000). Previous international studies have reported associations between smartphone multitasking, attentional disruption, reduced academic engagement, and subjective memory complaints (May & Elder, 2018; Wilmer et al., 2017). However,

comparatively limited research has examined these relationships among Indian undergraduate students.

The present study therefore aimed to examine the relationship between smartphone multitasking and self-reported attention difficulties and self-reported memory difficulties among Indian undergraduate students.

2. Method

Research Design

A quantitative cross-sectional correlational research design was adopted.

Participants

The study included **154 undergraduate students** aged between **18 and 24 years** recruited through convenience sampling from colleges and universities across India.

Instruments

The online questionnaire consisted of four sections:

- Demographic Information
- Smartphone Multitasking Scale (5 items)
- Self-Reported Attention Difficulties Scale (5 items)
- Self-Reported Memory Difficulties Scale (4 items)

Responses were recorded using five-point Likert scales.

Procedure

The questionnaire was administered online using Google Forms. Participation was voluntary, anonymous, and based on informed consent.

Statistical Analysis

Data were analysed using SPSS. Descriptive statistics, Cronbach's alpha, Pearson's Product-Moment Correlation, independent-samples *t*-tests, and one-way ANOVA were conducted.

3. Results

The reliability analysis demonstrated excellent internal consistency for all three scales, with Cronbach's alpha coefficients exceeding .90.

Descriptive statistics indicated moderate levels of smartphone multitasking, self-reported attention difficulties, and self-reported memory difficulties among participants.

Pearson's correlation analysis revealed a significant positive relationship between smartphone multitasking and self-reported attention difficulties ($r = .772, p < .001$). A significant positive relationship was also observed between smartphone multitasking and self-reported memory difficulties ($r = .659, p < .001$). Additionally, self-reported attention difficulties and self-reported memory difficulties were positively correlated ($r = .760, p < .001$).

Independent-samples *t*-tests showed no statistically significant gender differences in smartphone multitasking, attention difficulties, or memory difficulties ($p > .05$). Similarly, one-way ANOVA indicated no statistically significant differences across academic years.

4. Discussion

The findings indicate that greater smartphone multitasking is associated with increased self-reported attention and memory difficulties among undergraduate students. These findings support Cognitive Load Theory (Sweller, 1988), which proposes that excessive cognitive demands reduce the resources available for effective learning, and Executive Attention Theory (Posner & Petersen, 1990), which highlights the role of attentional control in managing competing information.

The observed relationships are consistent with previous studies reporting that media multitasking is associated with attentional disruption, reduced academic engagement, and subjective memory complaints (Ophir et al., 2009; Wilmer et al., 2017). However, the absence of significant differences across gender and academic year suggests that smartphone multitasking is a common behaviour among undergraduate students irrespective of demographic characteristics.

5. Conclusion

The present study demonstrated that smartphone multitasking is positively associated with self-reported attention difficulties and self-reported memory difficulties among Indian undergraduate students. These findings contribute to the growing literature on digital behaviour and cognition within higher education and emphasise the importance of encouraging balanced smartphone use during academic activities. Future research should employ longitudinal

designs, objective cognitive assessments, and larger, more diverse samples to further investigate these relationships.

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