

EXPLORING THE RELATIONSHIP BETWEEN MOBILE PHONE ADDICTION AND LEARNING ENGAGEMENT AMONG GUANGXI COLLEGE STUDENTS

Qi TAN¹ and Hsuan-Po WANG¹

¹ Faculty of Education Program, Dhurakij Pundit University, Thailand;
553943202@qq.com (Q. T.); hsyampo.wang@dpu.ac.th (H. W.)

ARTICLE HISTORY

Received: 12 May 2025

Revised: 26 May 2025

Published: 3 June 2025

ABSTRACT

The objectives of this research were: 1) to study the level of mobile phone addiction, self-control, and learning engagement among college students in Guangxi Province, China; 2) to explore differences in mobile phone addiction, self-control, and learning engagement across demographic variables (gender and year level); 3) to examine the relationships among mobile phone addiction, self-control, and learning engagement; and 4) to investigate the mediating role of self-control in the relationship between mobile phone addiction and learning engagement. This study employed a quantitative research methodology using a questionnaire survey. The research framework was developed based on relevant theories including the Cognitive-Behavioral Model and Self-Determination Theory. The population consisted of undergraduate students from three comprehensive universities located in Baise, Nanning, and Hezhou, Guangxi, China. A total of 600 questionnaires were distributed online, and 564 valid responses were collected using convenience sampling. The instruments included: 1) the Mobile Phone Addiction Index (MPAI), 2) the Utrecht Work Engagement Scale-Student (UWES-S), and 3) the Self-Control Scale (SCS). Data were analyzed using descriptive statistics, t-tests, ANOVA, correlation analysis, regression analysis, and mediation testing. The research results revealed that: 1) levels of mobile phone addiction among Guangxi college students were moderate, while self-control and learning engagement levels were relatively high; 2) significant differences were found in self-control and learning engagement across gender and year level, but not in mobile phone addiction; 3) mobile phone addiction negatively influenced self-control and learning engagement, while self-control positively influenced learning engagement; and 4) self-control had a mediating effect on the relationship between mobile phone addiction and learning engagement.

Keywords: Mobile Phone Addiction, Self-Control, Learning Engagement, Guangxi, College Students

CITATION INFORMATION: Tan, Q., & Wang, H. (2025). Exploring the Relationship between Mobile Phone Addiction and Learning Engagement among Guangxi College Students. *Procedia of Multidisciplinary Research*, 3(6), 15.

INTRODUCTION

The widespread proliferation of mobile technology has significantly transformed the lifestyles and learning behaviors of university students worldwide. In China, the rapid expansion of higher education has increased university enrollment rates substantially. However, this expansion has also brought about growing concerns regarding students' academic motivation and engagement. Learning engagement is considered a critical determinant of academic success, encompassing cognitive, emotional, and behavioral involvement in educational activities. High levels of engagement are positively associated with autonomy, resilience, and personal development—essential traits for academic achievement and successful social integration.

The ubiquitous presence of smartphones among university students has introduced new challenges. According to the 53rd Statistical Report on China's Internet Development by the China Internet Network Information Center (CNNIC, 2024), as of December 2023, the number of mobile internet users reached 1.091 billion, representing 99.9% of all internet users in the country. For many students, smartphones have become indispensable tools for communication, entertainment, and even learning. However, excessive, and unregulated use of mobile phones—characterized by compulsive checking, prolonged screen time, and preference for entertainment over academic activities—has raised concerns about mobile phone addiction.

Recent studies have consistently demonstrated a significant negative correlation between mobile phone addiction and learning engagement. Addicted individuals often exhibit reduced attention spans, increased procrastination, and diminished academic performance. Physiologically, smartphone overuse can lead to fatigue, sleep disturbances, and musculoskeletal discomfort. Psychologically, it has been associated with anxiety, depression, and a lack of academic self-efficacy. These factors collectively undermine students' ability to concentrate, participate meaningfully in class, and complete academic tasks effectively.

Self-control has emerged as a key psychological construct in understanding and mitigating the effects of smartphone addiction. Students with high levels of self-control are better able to resist distractions, manage time efficiently, and sustain academic focus. Conversely, low self-control increases susceptibility to addictive behaviors and hampers academic functioning. Additionally, demographic variables such as gender and academic year may moderate the relationship between smartphone addiction, self-control, and learning engagement.

Guangxi Province, located in southern China, is a multi-ethnic region known for its distinctive cultural heritage and strategic geographic location. In recent years, Guangxi has made notable progress in higher education, promoting discipline specialization, institutional transformation, and academic cooperation. Despite these advancements, smartphone dependency among university students in Guangxi remains prevalent. Empirical data suggest that over 95% of students use their smartphones for more than two hours daily, and a significant proportion report anxiety when separated from their devices. This behavioral trend has led to fragmented learning routines and decreased academic attentiveness.

Given these observations, the present study aims to investigate the impact of mobile phone addiction on learning engagement among college students in Guangxi Province, China. Furthermore, it explores the mediating role of self-control and examines whether demographic factors such as gender and academic year moderate these relationships. The findings of this research are expected to contribute to a deeper understanding of the behavioral mechanisms affecting student learning and provide evidence-based recommendations for educational practitioners and policymakers seeking to enhance academic engagement in the digital era.

LITERATURE REVIEWS

In the digital age, smartphones have become integral to university students' daily lives, offering essential benefits such as communication, instant access to information, and flexible learning

opportunities. However, the pervasive and unregulated use of smartphones has triggered increasing academic and psychological concerns. In particular, **smartphone addiction**—characterized by excessive, compulsive use—has emerged as a behavioral issue that hinders students' ability to focus, exercise self-regulation, and engage meaningfully with academic content. This literature review synthesizes key theoretical frameworks and empirical evidence related to smartphone addiction, self-control, and learning engagement, focusing on their interrelations among Chinese university students, especially within Guangxi Province.

Theoretical Foundations

This study draws upon three foundational theories: **Media System Dependency Theory, Cognitive-Behavioral Model, and Self-Determination Theory**. Collectively, these frameworks provide a comprehensive perspective on the psychological, behavioral, and motivational underpinnings of smartphone addiction.

Media System Dependency Theory (Ball-Rokeach & DeFleur, 1976) posits that individuals become reliant on media to satisfy informational, emotional, and social needs. In academic contexts, students may depend on smartphones to alleviate stress or seek gratification, potentially developing maladaptive usage patterns when lacking sufficient self-regulatory skills.

The Cognitive-Behavioral Model (Davis, 2001) identifies behavioral addiction as a consequence of cognitive distortions and maladaptive coping strategies. Students with low self-efficacy or distorted academic beliefs may use smartphones as an escape mechanism, which undermines academic concentration and performance.

Self-Determination Theory (Deci & Ryan, 1985) highlights the role of intrinsic motivation, autonomy, and competence in sustaining engagement. Students with diminished internal motivation may substitute academic pursuits with smartphone-based entertainment, especially if their capacity for self-regulation is low.

Smartphone Addiction: Definition and Measurement Smartphone addiction is conceptualized as an uncontrollable, excessive pattern of smartphone use that leads to significant disruptions in academic, social, and emotional functioning. It shares behavioral similarities with gambling and internet addiction, including cravings, withdrawal symptoms, and impaired impulse control.

This study employs the Mobile Phone Addiction Index (MPAI) developed by Leung (2008), comprising four dimensions: loss of control, withdrawal, escapism, and inefficiency. The scale has demonstrated strong reliability in multiple studies involving Chinese student populations. **Self-Control and Academic Functioning** Self-control is defined as an individual's ability to regulate thoughts, emotions, and behaviors to achieve long-term goals. Within academic environments, self-control enables students to manage distractions, sustain focus, and adhere to study plans. In contrast, poor self-control is associated with impulsivity, academic procrastination, and susceptibility to digital overuse.

Tan and Guo (2008) adapted a culturally relevant self-control scale for Chinese students, comprising five factors: impulse control, health habits, resistance to temptation, focus on academic tasks, and restraint from entertainment. The scale has been validated in various empirical contexts.

Learning Engagement: Conceptualization and Assessment Learning engagement refers to the cognitive, emotional, and behavioral investment that students demonstrate in academic activities. It includes sustained attention, active participation, emotional involvement, and commitment to academic goals.

Zhang Na (2012) conceptualized learning engagement as encompassing deep thinking, energetic participation, and positive affect in learning. This study adopts the Utrecht Work Engagement Scale for Students (UWES-S) revised by Fang et al. (2008), which evaluates three components: vigor, dedication, and absorption.

Empirical Interrelationships among Variables Smartphone Addiction and Learning Engagement: A substantial body of research confirms a negative correlation between smartphone addiction and learning engagement. Excessive use reduces attention span, increases procrastination, and leads to cognitive fatigue (Zhu et al., 2022; Xu, 2023).

Smartphone Addiction and Self-Control: Numerous studies reveal that smartphone addiction is inversely related to self-control. Individuals with poor impulse regulation are more prone to addictive behavior and academic difficulties (Zhao et al., 2020; Liu et al., 2021; Wei, 2023).

Self-Control and Learning Engagement: Self-control positively predicts learning engagement. Students with higher self-regulation persist longer in academic tasks, manage their time effectively, and resist distractions (Wei, 2023; Qu, 2023).

Mediating Role of Self-Control: Emerging evidence suggests that self-control mediates the relationship between smartphone addiction and learning engagement. That is, smartphone addiction reduces self-control, which in turn diminishes academic engagement (Lin Meiling et al., 2024; Zhang et al., 2022).

Extended Considerations: Motivation and Regulation Beyond addiction and self-control, intrinsic motivation and self-regulation play vital roles in shaping academic engagement. Students driven solely by external rewards or lacking self-motivation are more vulnerable to digital distractions. Conversely, those with strong self-regulation are better equipped to maintain focus and academic discipline despite the presence of smartphone-related temptations. The reviewed literature reveals a complex interplay between smartphone addiction, self-control, and learning engagement. Smartphone overuse undermines both self-regulation and academic involvement, while self-control enhances engagement and serves as a protective buffer. By integrating theory and empirical insights, this study aims to further elucidate these dynamics within the Guangxi university student population, offering implications for educators and policymakers seeking to foster healthier academic behaviors in the digital age.

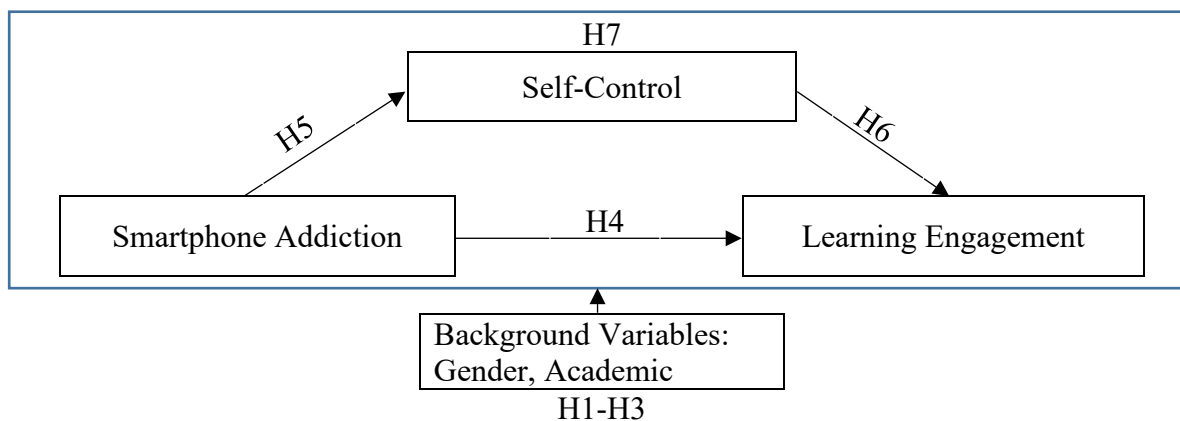


Figure 1 Research Framework

RESEARCH METHODOLOGY

The population and Sample Group: This study involved undergraduate students from three comprehensive universities in Baise, Nanning, and Hezhou, Guangxi Province, China. These institutions were chosen for their academic diversity and regional representation. Using a convenience sampling method, 600 online questionnaires were distributed via the "Questionnaire Star" platform. After excluding invalid responses, 564 valid questionnaires were collected, yielding a 94% response rate. Among the respondents, 280 (49.60%) were male and 284 (50.40%) were female. In terms of academic year, 122 (21.60%) were freshmen, 155 (27.50%) sophomores, 154 (27.30%) juniors, and 133 (23.60%) seniors.

Research Instruments: A structured questionnaire was used to assess mobile phone addiction, self-control, and learning engagement. The instrument comprised four sections: demographic information (gender and academic year), mobile phone addiction, learning engagement, and self-control.

Mobile Phone Addiction was measured using Leung's (2008) MPAT, consisting of 17 items across four dimensions.

Learning Engagement was assessed with the UWES-S scale, revised by Fang Laitan et al. (2008), comprising 17 items in three dimensions.

Self-Control was evaluated using a 19-item scale developed by Tan Shuhua & Guo Yongyu (2008), covering five dimensions. Responses were collected using Likert-type scales (5- or 7-point, depending on the instrument). All scales demonstrated high internal consistency (Cronbach's $\alpha > 0.87$), and pretest results confirmed strong item discrimination and good reliability and validity. These instruments effectively captured the constructs necessary to test the research hypotheses.

Data Collection The data for this study were collected using an online questionnaire distributed through the "Questionnaire Star" platform. The target participants were undergraduate students from three comprehensive universities located in Baise, Nanning, and Hezhou cities in Guangxi Province, China.

A **pilot test** was conducted with 160 students to evaluate the reliability and validity of the research instruments.

The **final questionnaire** was distributed online, with assistance from academic advisors who shared the survey link in student class groups.

The **sampling method** used was **convenience sampling**.

A total of **600 questionnaires** were distributed, and **564 valid responses** were collected, yielding a **response rate of 94%**.

All data were kept **confidential** and were used solely for statistical analysis, including item analysis, reliability, and validity testing, as well as hypothesis testing through correlation and regression analyses.

Data Analysis

The statistics used in this research are this time.

- 1) Frequency distribution
- 2) Percentage Value
- 3) Validity Analysis
- 4) Descriptive Statistics
- 5) Inferential Statistics

RESEARCH RESULTS

This study analyzed data from 564 valid responses collected from undergraduate students at three comprehensive universities in Guangxi Province, China. The objective was to investigate the influence of mobile phone addiction on learning engagement, with self-control as a mediating variable. The findings are presented as follows:

Descriptive Statistics

Mobile Phone Addiction: The mean total score was 2.322 (SD = 0.976), indicating a moderate level of addiction. Sub-dimension scores included:

Loss of control: M = 2.316 (SD = 1.006)

Withdrawal symptoms: M = 2.328 (SD = 1.054)

Avoidance behavior: M = 2.318 (SD = 1.046)

Inefficiency: M = 2.335 (SD = 1.065)

Learning Engagement: Students demonstrated a moderate to high level of learning engagement across dimensions such as vigor, dedication, and absorption.

Self-Control: Overall self-control levels were moderate, with some variation across sub-dimensions like impulse control, health habits, and resisting temptation.

Table 1 Results of Hypothesis Testing

The results of hypothesis testing are summarized below:

Hypothesis	Result
H1: Background variables (gender, year) significantly affect mobile phone addiction.	Not Supported
H1a: Significant differences in mobile phone addiction based on gender.	Supported
H2: Background variables significantly affect learning engagement.	Partially Supported
H3: Background variables significantly affect self-control.	Supported
H4: Mobile phone addiction negatively influences learning engagement.	Supported
H5: Mobile phone addiction negatively influences self-control.	Supported
H6: Self-control positively influences learning engagement.	Supported
H7: Self-control mediates the relationship between mobile phone addiction and learning engagement.	Supported

Table 1 presents the results of hypothesis testing based on the statistical analyses conducted in this study. The findings offer a comprehensive understanding of the relationships between mobile phone addiction, self-control, and learning engagement among college students in Guangxi Province, China. The analysis indicates that the overall background variables, including gender and academic year, do not have a statistically significant effect on mobile phone addiction, as reflected in the rejection of Hypothesis 1. However, further examination reveals partial support for Hypothesis 2, suggesting that certain demographic subgroups exhibit significant differences in learning engagement. Hypothesis 3 is supported, confirming that background variables significantly influence self-control. This implies that individual characteristics such as gender and academic standing are associated with variations in students' ability to regulate their behavior and maintain academic discipline. In terms of the core variables, Hypothesis 4 is supported, affirming a significant negative impact of mobile phone addiction on learning engagement. This finding is consistent with prior research suggesting that excessive mobile phone use diminishes students' attention, motivation, and academic participation. Hypothesis 5 is also supported, indicating a significant negative relationship between mobile phone addiction and self-control. Students who are more dependent on mobile phones tend to experience reduced self-regulatory capacity, which undermines their ability to manage academic tasks effectively. Moreover, Hypothesis 6 is validated, showing that self-control positively influences learning engagement. Students with higher levels of self-discipline are more likely to remain focused, manage time efficiently, and engage actively in their academic responsibilities. Finally, Hypothesis 7 is supported, demonstrating that self-control serves as a mediating variable between mobile phone addiction and learning engagement. This suggests that mobile phone addiction indirectly reduces academic engagement by weakening self-control mechanisms. Enhancing students' self-regulatory skills may therefore be a critical intervention point to mitigate the adverse academic effects of mobile phone overuse.

DISCUSSION & CONCLUSION

The results of this study offer significant contributions to the growing body of literature concerning the behavioral and psychological consequences of mobile phone addiction among college students, particularly within the sociocultural context of Guangxi Province, China. By integrating theoretical insights from the Media System Dependency Theory, the Cognitive-

Behavioral Model, and Self-Determination Theory, this research provides a multidimensional understanding of how excessive smartphone usage can influence students' learning behaviors and self-regulatory capacities.

The negative influence of mobile phone addiction on learning engagement—confirmed by the results of Hypothesis 4—is consistent with a substantial body of empirical research. Students with high levels of smartphone dependency often exhibit a reduction in sustained attention, diminished interest in academic tasks, and impaired cognitive processing. These patterns are symptomatic of a behavioral displacement effect, where time and cognitive resources are diverted from learning activities to smartphone-related behaviors. This is particularly concerning in an academic environment that increasingly demands critical thinking, sustained effort, and emotional engagement. The empirical validation of this relationship within the Chinese context adds cross-cultural robustness to the growing global concern about digital distractions in higher education.

Moreover, the study confirmed the significant negative relationship between mobile phone addiction and self-control (Hypothesis 5). This finding aligns with prior research indicating that individuals who exhibit high levels of phone addiction often lack the psychological mechanisms necessary to regulate impulsive behaviors. The Cognitive-Behavioral Model explains this through maladaptive cognitions—such as distorted self-efficacy beliefs and a reliance on immediate gratification—which contribute to diminished executive functioning. In the academic domain, this results in procrastination, difficulty focusing, and inconsistent task completion.

Conversely, self-control emerged as a critical enabler of learning engagement, supporting Hypothesis 6. Students with strong self-regulation skills demonstrated higher levels of cognitive involvement, emotional commitment, and behavioral persistence in their academic tasks. This supports the assumptions of Self-Determination Theory, which emphasizes the role of autonomy and intrinsic motivation in fostering deep learning. Notably, the presence of self-control enables students to resist distractions, delay gratification, and maintain focus—abilities that are increasingly vital in the digital age, where temptations are ubiquitous and easily accessible.

A particularly salient contribution of this study is the confirmation of self-control as a mediating variable between mobile phone addiction and learning engagement (Hypothesis 7). This mediating role illustrates the indirect mechanism through which smartphone overuse diminishes students' academic engagement by eroding their ability to self-regulate. This insight is theoretically and practically significant, as it identifies a potential point of intervention. By targeting self-control, educators and policymakers may be able to mitigate the negative academic consequences associated with smartphone addiction.

The demographic analysis revealed nuanced patterns. While the overall effect of background variables such as gender and academic year on mobile phone addiction (Hypothesis 1) was not statistically significant, gender differences did emerge in specific sub-hypotheses, suggesting that males and females may experience and respond to digital stimuli in different ways. Hypothesis 2 was partially supported, indicating that year-level differences may affect how students engage with academic content and manage digital technologies. Hypothesis 3 confirmed the influence of background variables on self-control, suggesting that developmental, social, or educational experiences across years may contribute to differential self-regulation skills. Taken together, these findings have important implications for educational practice and policy. First, the high prevalence of mobile phone addiction among university students underscores the urgent need for digital literacy and wellness programs that go beyond awareness-raising to actively cultivate digital self-discipline. Universities should consider integrating self-regulation training into orientation programs, student development initiatives, and academic advising services. Second, educators should be trained to recognize

signs of smartphone-related disengagement and adopt pedagogical approaches that foster intrinsic motivation, time management, and metacognitive awareness. Third, the role of family, peer networks, and institutional culture in shaping students' technology habits warrants further exploration.

In conclusion, this study provides a theoretically grounded and empirically validated model that elucidates the pathways through which mobile phone addiction affects learning engagement via self-control. It enriches existing scholarship by contextualizing these relationships within the unique educational and cultural environment of Guangxi Province, China. The findings advocate for a holistic approach to student development—one that balances the opportunities and risks of technology with the psychological tools needed to use it responsibly. By prioritizing interventions that enhance self-control, educational institutions can better equip students to navigate the challenges of modern academic life and achieve sustainable learning outcomes in an increasingly digital world.

REFERENCES

- Ibrahim, N. K., Baharoon, B. S., Banjar, W. F., Jar, A. A., Ashor, R. M., Aman, A. A., & Al-Ahmadi, J. R. (2018). Mobile phone addiction and its relationship to sleep quality and academic achievement of medical students at King Abdulaziz University, Jeddah, Saudi Arabia. *Journal of research in health sciences*, 18(3), e00420.
- Tian, J., Zhao, J. Y., Xu, J. M., Li, Q. L., Sun, T., Zhao, C. X., ... & Zhang, S. E. (2021). Mobile phone addiction and academic procrastination negatively impact academic achievement among Chinese medical students. *Frontiers in psychology*, 12, 758303.
- Jinfu Wang, Liang Li, Qinmei Wu, Na Zhang, Rulan Shangguan & Guan Yang. (2025). Effects of parental psychological control on mobile phone addiction among college students: the mediation of loneliness and the moderation of physical activity. *BMC Psychology*, (1), 60-60.
- Jin, C., Fan, C., & Niu, J. (2024). How physical exercise influences academic burnout among Chinese “Double Non” college students: the chain mediation role of mobile phone addiction and learning engagement. *Frontiers in Psychology*, 14, 1289499.
- Xiantong Yang, Yujia Yang, Dan Qin & Mengmeng Zhong. (2025). *Who is the antecedent? Mapping the relation from mental health to mobile phone addiction using cross-lagged panel network analysis*. Current Psychology (prepublish).

Data Availability Statement: The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Conflicts of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher’s Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.



Copyright: © 2025 by the authors. This is a fully open-access article distributed under the terms of the Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0).