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The Influence of Mobile Phone Dependence on Academic Achievement: The Mediating Role of Academic Procrastination

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Abstract

In the digital era, the pervasive adoption of smartphones has exerted a profound impact on college students' daily lives and academic performance. Against this backdrop and grounded in social cognitive theory, this study hypothesizes that mobile phone dependence indirectly affects academic achievement through academic procrastination and constructs a corresponding mediation model. Employing a cross-sectional survey design, we sampled 407 students majoring in Computer Science and Technology at Hebei Agricultural University. The Mobile Phone Addiction Tendency Scale was utilized to assess the degree of mobile phone dependence, while the Procrastination Assessment Scale for Students evaluated academic procrastination behaviors. Concurrently, academic performance data were collected for quantitative analysis. The findings revealed a significant negative correlation between mobile phone dependence and academic performance, with academic procrastination serving as a mediating variable in their relationship. Structural equation modeling confirmed the hypothesis that mobile phone dependence indirectly influences academic performance via academic procrastination, wherein the mediating effect of academic procrastination accounted for 47.6% of the total effect. These results underscore the importance of regulating mobile phone usage and reducing academic procrastination to enhance college students' academic outcomes. Furthermore, the study provides a theoretical foundation for educational interventions and aids in formulating targeted strategies to optimize students' study habits.

1. INTRODUCTION

As technology advances at a breakneck pace, cellphones have undergone significant and revolutionary transformations (Huang, Y., & Khan, J., 2022).Having evolved from basic call functionalities to comprehensive multifunctional devices, smartphones have deeply permeated every facet of daily life, providing an extensive array of convenient services such as mobile

payments, online education, instant communication, and more (Malone, et al., 2023).The widespread proliferation of smartphones has bestowed unprecedented convenience upon the collegiate population, rendering the integration of online and offline teaching models the new norm. This technological advancement not only optimizes the acquisition of educational resources but also enhances learning efficiency and interactivity (Sapci, et al., 2021). However, this convenience is accompanied by certain underlying concerns (Mei et al., 2023). Although smartphones have enriched students' daily lives, the phenomenon of mobile phone dependence has become increasingly prevalent (Kheradmand et al., 2023). Mobile phone dependence not only impacts students' mental health but also engenders issues such as academic procrastination (Li et al., 2020; Liu et al., 2022), significantly impacting academic performance (Amez et al., 2023). Consequently, it is imperative to explore the relationship between mobile phone dependence and its effects on academic achievement.

Numerous studies have already established a negative correlation between mobile phone dependence and academic performance (Alinejad et al., 2022; Zhang & Zeng, 2024; Rathakrishnan et al., 2021). For instance, Rathakrishnan et al. (2021) conducted a quantitative study involving 323 students from a public university in Sabah, which indicated that greater smartphone addiction correlates with lower academic performance. In the research by Zhang and Zeng (2024), involving 2,097 university students, the relationships among smartphone addiction, academic control, academic anxiety, and academic achievement were assessed. Their findings revealed that smartphone addiction has a direct negative impact on academic performance, and additionally, mobile phone dependence influences academic achievement through its moderating effects on academic anxiety and academic control.

The impact of mobile phone dependence on academic procrastination, as well as the influence of academic procrastination on academic performance, has garnered the attention of scholars. Research indicates a positive correlation between smartphone addiction and academic procrastination (Li et al., 2020; Liu et al., 2022; Zhou et al., 2023; Xiong et al., 2024). Li et al. (2020) examined the effects of smartphone addiction on academic procrastination among university students, along with the mediating role of academic self-efficacy. Similarly, Liu et al. (2022) investigated the mediating effects of time management and learning strategies in the relationship between smartphone addiction and academic procrastination. These studies consistently affirm this positive correlation. Furthermore, academic research has demonstrated a negative correlation between academic procrastination and academic performance (Tian et al., 2021; Diotaiuti et al., 2021), as observed in Goroshit's (2018) study. However, negative correlation does not inherently imply causation. In the absence of experimental evidence, it is essential to refrain from directly attributing procrastination as the cause of declining academic performance. Future research should employ more rigorous methodologies to elucidate the potential causal mechanisms between these two factors.

Currently, there is a significant gap in research regarding the specific mechanisms through which mobile phone dependence influences academic performance via academic procrastination as a mediating variable. To address this void, the present study employs the *Mobile Phone Addiction Index* (MPAI), developed by Professor Liang Yongqi of The Chinese University of Hong Kong, to assess students' levels of mobile phone dependence. Additionally, the academic procrastination assessment scale, co-developed by Solomon and Rothblum

(1984), will be utilized to evaluate procrastination behaviors, with academic performance indicators based on grades from the fall semester of the 2024 academic year. The study sample consists of 427 first- and second-year students majoring in Computer Science and Technology. Through these instruments and data, the research aims to explore the intricate relationships among mobile phone dependence, academic procrastination, and academic performance, with the objective of elucidating the internal mechanisms by which mobile phone dependence impacts academic achievement. This investigation not only provides theoretical support and empirical evidence for educational practice, aiding educators in developing effective intervention strategies to assist students in better managing mobile phone usage and thereby enhancing academic performance, but also offers new perspectives and directions for future research.

2. LITERATURE REVIEW

The impact of smartphone dependence on academic performance

Smartphone dependence, akin to addiction to the internet and video games, is a form of behavioral addiction caused by excessive use of modern technology. This obsessive state, driven by certain motives, leads to overuse of smartphones, impairing users' psychological and social functioning, and has garnered significant attention from both society and academia (Li et al., 2020; Chang et al., 2022). Numerous scholars have found that smartphone dependence has negative effects on both physical and mental health (Li et al., 2022; Mei et al., 2024). Moreover, this dependence can result in distraction (Mahsud et al., 2021), subsequently causing a decline in students' academic performance.

Zhang and Zeng (2024), through a survey of 2,097 college students using a questionnaire scale, discovered a significant negative correlation between smartphone addiction and academic performance, with academic anxiety serving as a complete mediator. Additionally, academic control moderated this relationship, showing that higher levels of academic control weakened the impact of addiction on academic anxiety. However, the cross-sectional design of the study limited the ability to establish causal relationships.

Alinejad et al. (2022) conducted a cross-sectional study of 447 Iranian college students using a questionnaire and found that “fear of missing out” was positively correlated with smartphone addiction and loneliness, and indirectly affected academic performance through loneliness. However, the sample was confined to a single region, limiting the generalizability of the results.

Rathakrishnan et al. (2021) conducted a random sampling study of 323 Malaysian college students, using the short version of the Smartphone Addiction Scale and the Pittsburgh Sleep Quality Index. Descriptive and inferential analyses conducted via SPSS revealed that smartphone addiction was related to poor sleep quality, both of which jointly influenced academic performance. Although the study employed various scales to enhance the reliability of the results, the small sample size and reliance on self-reported data may introduce bias.

These studies consistently indicate that smartphone addiction negatively impacts academic performance through variables such as academic anxiety, loneliness, and sleep quality. However, methodological limitations suggest that future research should adopt longitudinal designs and broader samples to further explore the mechanisms by which smartphone dependence affects academic performance.

The impact of academic procrastination on academic performance

The concept of academic procrastination was first introduced by Solomon and Rothblum (1984), defining it as the unnecessary delay in completing academic tasks, leading to psychological discomfort. The two key characteristics of academic procrastination are the postponement of task completion and the resulting psychological distress; thus, the sum of these two aspects can be used to measure the degree of procrastination. Some scholars define academic procrastination as students deliberately postponing the completion of academic tasks, which is commonly seen in students who are highly dependent on smartphones (Li et al., 2020).

Alaya et al. (2021) conducted a cross-sectional descriptive study on 1,019 medical, law, and engineering students, using scales for academic procrastination, impulsive behavior, life satisfaction, perfectionism, and self-esteem. The study found a significant positive correlation between academic procrastination and academic failure, closely linked to impulsivity and alcohol consumption. However, the sample was primarily from Tunisia, and differences in culture and educational systems may affect the generalizability of the results.

Tian et al. (2021) conducted a cross-sectional study on 3,511 Chinese medical students through an online questionnaire and hierarchical multiple regression analysis, discovering that academic procrastination and smartphone addiction are prevalent and have a significant negative impact on academic performance. The study emphasized the importance of creating more effective learning environments for medical students; however, the self-reported nature of the data may have introduced social desirability bias.

These studies collectively demonstrate that academic procrastination significantly negatively affects academic performance through variables such as impulsivity and life satisfaction.

Support from social cognitive theory

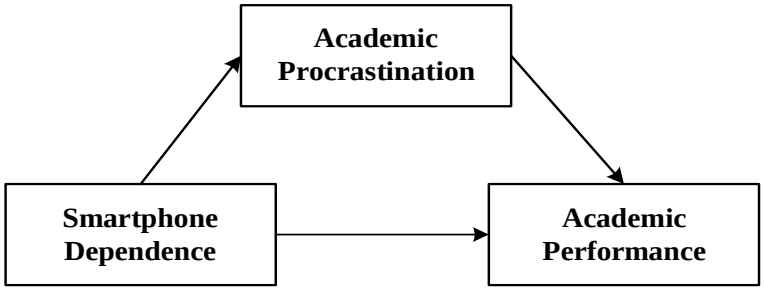

Figure1. The Theoretical Structural Model of How Smartphone Addiction Influences Academic Achievement Through Academic Procrastination

Social Cognitive Theory, proposed by Bandura (1986), emphasizes the interaction between individual behavior, environmental, and cognitive factors. The core concepts of Social Cognitive Theory, including triadic reciprocal determinism, observational learning, and self-efficacy, all help explain the relationship between smartphone dependence, academic procrastination, and academic performance (Schunk, 2012; Pajares, 2002).

In triadic reciprocal determinism, individual behavior, personal cognition, and environmental factors interact, collectively determining learning outcomes (see Fig. 1). In this study, individual behavior corresponds to smartphone dependence. The individual's choice to

fulfill needs via smartphones within specific environments not only impacts learning efficiency but also directly correlates with academic performance.

Environmental factors relate to academic procrastination, where external temptations in the learning environment play a significant role, leading to procrastination in academic tasks and consequently affecting learning progress and outcomes. Finally, cognitive factors are reflected in academic performance. Students' perceptions and expectations of their academic performance are influenced by smartphone dependence and procrastination behaviors, ultimately affecting their academic achievement.

Social Cognitive Theory further posits that an individual's behavior influences long-term performance and outcomes (Zimmerman, 2000). Smartphone dependence may weaken self-regulation, thereby increasing academic procrastination, which indirectly leads to a decline in academic performance.

Therefore, we propose the following hypotheses:

H1: Smartphone dependence has a negative impact on academic performance.

H2: Academic procrastination has a negative impact on academic performance.

H3: Academic procrastination mediates the relationship between smartphone dependence and academic performance.

3. RESEARCH methodology

Participants and contexts

In the context of the digital era, the widespread use of smartphones has had a significant impact on college students' academic performance. This study selects students from the Computer Science and Technology major at the Bohai Campus of Hebei Agricultural University as the sample. Despite their high admission scores, a considerable number of these students face difficulties graduating, highlighting a potentially representative relationship between smartphone usage and academic performance. This phenomenon is prevalent among university students across China, making the findings widely applicable.

Our aim is not limited to the Computer Science and Technology field; rather, we intend to use this specific group to reveal a broader trend: the association between academic performance and smartphone dependence. We hypothesize that this association exists across other disciplines as well. The choice of Computer Science and Technology students is based on their academic pressures and employment challenges, which may intensify the impact of smartphone dependence on their academic outcomes.

Participant recruitment for this study commenced on May 24, 2024, and concluded on June 2, 2024. Questionnaires were distributed online to first- and second-year students in the Computer Science and Technology program. A total of 413 questionnaires were collected, of which 407 were deemed valid, yielding a response rate of 98.5%. This group was chosen because they are at a critical stage of academic and professional development, facing substantial academic pressures and employment challenges, making them an ideal sample for studying the effects of smartphone dependence on academic performance.

Given the study's anonymity and non-intrusive nature, we did not obtain formal written informed consent. Instead, we provided a detailed explanation of the study in online group chats, including its purpose, procedures, and participants' rights, clearly informing them that their participation was voluntary and that they could withdraw at any time. By completing and

submitting the questionnaire, participants indicated their informed consent to the study. Since the research involved adult students, there was no need to obtain consent from parents or guardians.

Data collection

Mobile Phone Addiction Tendency Scale (MPATS)

Developed by Xiong Jie (2012), the MPATS is used to diagnose smartphone addiction in college students. It employs a five-point scoring system with a total of 16 items, covering four dimensions: withdrawal symptoms, prominent behavior, social comfort, and mood alteration. The overall Cronbach's alpha for the scale is 0.857.

Procrastination Academic Students' Scale (PASS)

The PASS, co-developed by Solomon and Rothblum (1984), is a tool for assessing academic procrastination. The scale consists of two parts. The first part lists six academic tasks, including writing term papers, exam preparation, completing weekly assignments, managing administrative tasks, attending meetings, and completing general academic tasks. It evaluates the extent of procrastination in each task and asks participants to assess the severity of their procrastination. Additionally, this part evaluates the participant's willingness to change their procrastination behavior. The second part presents a specific simulated situation and lists 13 potential reasons for procrastination, with each reason comprising two items. Participants rate the reasons for their procrastination on a five-point scale.

As this study focuses solely on the degree of procrastination and not its causes, only the first part of the scale was used. The Chinese version of the scale is derived from Guan Xueqing's (2015) compilation and revision. In this administration, the total scale's Cronbach's alpha coefficient is 0.905.

Reliability and validity of the questionnaire

A Cronbach's alpha coefficient above 0.7 indicates high reliability, and if the scale contains fewer than six items, a coefficient greater than 0.6 is still acceptable. The validity of the questionnaire was assessed from two aspects: content validity and construct validity. The design of this questionnaire was informed by extensive literature reviews and in-depth interviews with participants, as well as multiple discussions with professors. Thus, the content validity of the questionnaire is robust. For construct validity, the Kaiser-Meyer-Olkin (KMO) value and Bartlett's test of sphericity were used to determine the suitability of the questionnaire.

Table 1. Reliability and validity test of the questionnaire

Scale	Number of Items	α Coefficient	KMO Value	Bartlett's Sphericity Test		
				Approximate Chi-Square	Degrees of Freedom	Significance
Smartphone Dependence	16	0.857	0.927	1410.363	120	0.000
Academic Procrastination	18	0.905	0.952	2294.954	153	0.000
Total Scale	34	0.933	0.956	4332.871	561	0.000

As shown in Table 1, statistical analysis using SPSS 27.0 revealed that the Cronbach's alpha coefficients for smartphone dependence and academic procrastination exceeded 0.7, indicating good reliability of the questionnaire. The KMO values for smartphone dependence, academic

procrastination, and the overall questionnaire were all above 0.8, with a p-value of 0.000, less than 0.01, demonstrating good construct validity.

University academic performance records

The academic performance data was sourced from the 2023-2024 first-semester final academic records of students majoring in Computer Science and Technology at the Bohai Campus of Hebei Agricultural University. The academic transcript serves as a crucial metric for evaluating student performance and provides a quantitative assessment tool for this study.

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Data analysis

The collected data was entered into SPSS 27.0 for analysis.

4. RESULTS AND DISCUSSION

Common method bias test

This study collected data through a questionnaire, which may be subject to common method bias. Using Harman's single-factor test (Harman, 1976), an exploratory factor analysis was conducted without rotation. The results revealed that 5 factors had eigenvalues greater than 1, with the first principal component explaining 32.9% of the variance, which is below the critical threshold of 40%. Therefore, this study does not suffer from significant common method bias.

Descriptive statistics and correlation analysis of key variables

Descriptive statistics for the variables are presented in Table 2. Pearson correlation coefficients are shown in Table 3, indicating a significant positive correlation between smartphone addiction and academic procrastination among college students ($r = 0.777$, $P < 0.01$).Mobile phone dependency significantly predicts academic procrastination ($B = 0.770$, $t = 24.715$, $P < 0.01$), and academic procrastination also significantly predicts lower academic performance ($B = -0.264$, $t = -3.208$, $P < 0.01$).

Table 2. Descriptive statistical analysis

Variable	Sample Size	Min	Max	Mean	Standard Deviation	Median
Gender	407	1.000	2.000	1.393	0.489	1.000
Grade Level	407	1.000	4.000	1.614	0.531	2.000
Smartphone Dependency	407	16.000	80.000	39.590	13.119	43.000
Academic Procrastination	407	18.000	90.000	44.494	16.533	50.000
Academic Performance	407	-0.951	4.356	2.950	0.861	3.126

Table 3 Pearson correlation coefficients

	1	2	3
1. Smartphone Dependency	-		
2. Academic Procrastination	0.777**	-	
3. Academic Performance	-0.440**	-0.461**	-

Note: * indicates $p < 0.05$, ** indicates $p < 0.01$, same for the following tables.

Mediating model of academic procrastination between smartphone dependence and academic performance

In this model, smartphone dependence is used as the predictor variable, academic performance as the outcome variable, and academic procrastination as the mediating variable. Gender and grade level are included as control variables. The mediation model was constructed using the PROCESS macro in SPSS (Model 4), with 5000 bootstrap samples to test the mediation effect. Table 4 presents the results of the mediation effect. The results indicate that smartphone dependence significantly negatively predicts academic performance (B = -0.420, t = -9.700, P < 0.01). After adding the mediating variable, the direct effect of smartphone dependence on academic performance remains significant (B = -0.217, t = -3.208, P < 0.01). Additionally, smartphone dependence significantly positively predicts academic procrastination (B = 0.770, t = 24.715, P < 0.01), and academic procrastination significantly negatively predicts academic performance (B = -0.264, t = -3.208, P < 0.01).

Table 4. Regression Analysis of the Relationships Between Variables in the Mediation Model (N=407)

Regression Equation		Fitting Indicators			Coefficient Significance	
Outcome Variable	Predictor Variable	*R*	R^2	*F*	*B*	*t*
Academic Performance	Gender	0.499	0.244	44.613	0.460	5.193**
	Grade Level				0.158	1.945
	Smartphone Dependency				-0.420	-9.700**
Academic Procrastination	Gender	0.782	0.609	212.052	-0.101	-1.587
	Grade Level				-0.154	-2.628*
	Smartphone Dependency				0.770	24.715**
Academic Performance	Gender	0.526	0.269	38.397	0.433	4.960**
	Grade Level				0.118	0.146
	Academic Procrastination				-0.264	-3.882**
	Smartphone Dependency				-0.217	-3.208**

Using the bias-corrected percentile Bootstrap method provided by Hayes, the mediation effect was further tested with 5000 resamples, setting the confidence interval to 95%. Table 5 presents the test results, which show that smartphone dependence not only directly predicts academic performance but also predicts academic performance through academic procrastination as a mediating variable. Academic procrastination plays a partial mediating role in the relationship between smartphone dependence and academic performance, with the mediation effect accounting for 47.6% of the total effect. The mediation path is illustrated (Figure. 2).

Table 5. Mediation Effect Analysis

	Effect Value	Standard Error	Bootstrap95%CI		p-value	Proportion of Total Effect
			Lower Limit	Upper Limit		
Total Effect	-0.420	0.043	-0.505	-0.335	0.000	
Direct Effect	-0.216	0.067	-0.349	-0.083	0.000	51.4%
Indirect Effect	-0.204	0.066	-0.343	-0.084	0.000	47.6%

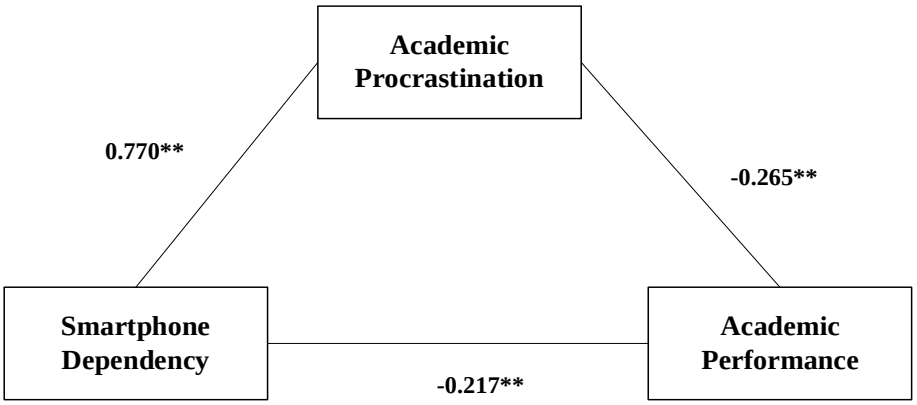

Figure 2. Mediation model of academic procrastination in the relationship between smartphone dependence and academic performance

This study explored the relationships among smartphone dependence, academic procrastination, and academic performance, revealing that smartphone dependence has a significant negative impact on academic achievement, with academic procrastination playing a mediating role in this relationship. These findings align with existing research, suggesting that excessive smartphone use may lead to distractions in learning, thereby affecting academic outcomes. However, the cross-sectional design of this study limits the ability to infer causal relationships. While significant associations were identified, we cannot definitively conclude that smartphone dependence directly causes a decline in academic performance. Thus, future research should employ longitudinal designs to better capture causal relationships and verify whether smartphone dependence truly affects academic procrastination and performance. Additionally, the limitations of the sample are worth noting. This study focused solely on students majoring in Computer Science and Technology at Hebei Agricultural University, which may not be representative of other disciplines or regions. Expanding the sample to include students from various disciplines and regions would enhance the generalizability and reliability of the findings.

Further research could explore more complex moderating variables, such as learning motivation and self-efficacy, which may play a crucial role in the relationships between smartphone dependence, academic procrastination, and academic performance. The combined effects of these factors could offer a more comprehensive understanding, helping to develop personalized intervention strategies. For instance, enhancing students' self-efficacy may reduce academic procrastination, thereby improving academic performance. It also serves as a warning, helping students recognize the potential negative impact that excessive smartphone dependence can have on their academic outcomes. Meanwhile, schools and teachers should pay attention to students' mental health and foster good study habits. Developing targeted educational interventions based on students' specific smartphone usage behaviors and their impact on academic performance is of particular importance. In conclusion, future research should not only focus on the effects of smartphone usage but also consider the psychological and motivational factors of students to provide more effective guidance and support for educational practices. By systematically investigating the interactions of these factors, we can better address the impact of smartphones on students' academic outcomes and promote their overall development.

5. CONCLUSION

Smartphone Dependence Has a Significant Negative Impact on Academic Performance

The results of this study clearly indicate that smartphone dependence significantly reduces students' academic performance, a finding that is highly consistent with conclusions from existing literature (Lepp et al., 2015; Samaha & Hawi, 2016). Specifically, the research shows that excessive reliance on smartphones during study periods often leads to distraction and reduced study time. For instance, Abbasi et al. (2021), in a systematic review, noted a negative correlation between smartphone dependence and academic performance, reflecting the prevalence of this phenomenon among students. Excessive smartphone use not only hinders students' focus in class but also makes them more susceptible to distractions from social media, games, and other applications, thus lowering learning efficiency (Junco, 2012). Moreover, the instant feedback and entertainment features of smartphones may encourage students to pursue short-term pleasure at the expense of their academic responsibilities, leading to a loss of motivation and sense of purpose in their studies (Kushlev et al., 2016). According to Social Cognitive Theory, self-efficacy plays a crucial role in academic performance (Pajares, 2002; Schunk, 2012; Zimmerman, 2000). When students overly depend on smartphones, their self-efficacy may be diminished, directly impacting their learning outcomes. Bandura (1986) emphasized the interaction between individual behavior, environment, and cognition, suggesting that excessive smartphone reliance may cause students to neglect other effective learning strategies, reducing their confidence in tackling academic challenges. This implies that smartphone dependence is not merely a habit but a complex factor that deeply affects academic performance, warranting further investigation into its underlying mechanisms.

Academic Procrastination Has a Significant Negative Impact on Academic Performance

The results also show a significant negative correlation between academic procrastination and academic performance. This finding is in line with previous research, as many scholars have pointed out that procrastination behavior leads to a decline in academic achievement (Tian et al., 2021; Li et al., 2020; Goroshit, 2018). For example, Hong (2011) emphasized that the prevalence of procrastination behavior makes it a critical factor influencing academic outcomes. In this study, students displayed noticeable procrastination behaviors, particularly when faced with academic tasks, often opting for short-term gratification, such as using smartphones for entertainment or social activities. The immediate pleasure from short-term smartphone use may lead students to neglect long-term academic goals, resulting in delays in completing their academic tasks (Steel, 2007; Sirois, 2014). This avoidance behavior not only postpones study time but also lowers students' confidence in their academic progress, ultimately leading to poorer academic performance. Social Cognitive Theory provides strong support for this, suggesting that academic procrastination can be viewed as a cognitive bias toward academic goals (Zimmerman, 2000). When students face significant academic pressure, the temptation of short-term goals makes it difficult for them to concentrate on their studies, ultimately resulting in poor academic outcomes. Therefore, a deeper understanding of the root causes of academic procrastination, particularly its relationship with smartphone use, will provide important theoretical foundations for the design of educational interventions.

Academic Procrastination Mediates the Relationship Between Smartphone Dependence and Academic Performance

This study further reveals that academic procrastination mediates the relationship between smartphone dependence and academic performance. Specifically, smartphone dependence induces procrastination behavior in students, which indirectly affects their academic outcomes. This conclusion is highly consistent with Social Cognitive Theory, emphasizing the importance of cognitive factors in behavioral choices (Schunk, 2012). In actual learning situations, many students under academic pressure often resort to using smartphones as an escape tool (Elhai et al., 2017), leading to a loss of study time (Lepp et al., 2015) and negatively impacting their academic performance. More specifically, the entertainment and social features of smartphones may entice students to immerse themselves in the virtual world outside of study time, creating a vicious cycle that ultimately affects their academic performance (Samaha & Hawi, 2016). The identification of this mediating role provides a new perspective for understanding how smartphone dependence impacts academic performance and also offers theoretical support for educators and counselors in developing effective intervention strategies.

Therefore, future research should continue to explore the smartphone usage behaviors of different types of students and their impact on academic performance, in order to better design personalized intervention programs to help students manage smartphone use and enhance academic performance. By comprehensively considering the complex relationship between smartphone dependence, academic procrastination, and academic performance, this study can provide a more solid theoretical foundation for educational practice. The following are insights for education based on the above conclusions:

Insights for Schools

To address the issue of smartphone dependence, schools should take systematic measures to create a healthy learning environment. First, schools can offer digital literacy courses to help students understand the potential impacts of smartphone use on academic and mental health. Course content should include strategies for responsible smartphone use, time management techniques, and self-regulation strategies, enabling students to practice self-discipline in their smartphone usage. Additionally, schools should offer a variety of extracurricular activities, such as sports, arts, and volunteer work, to reduce students' reliance on smartphones. This way, students can develop interests and hobbies while enhancing their social skills and teamwork abilities, fostering their holistic development. Schools can also organize specialized seminars, inviting mental health experts and educators to conduct in-depth analyses and discussions on smartphone dependence, helping students establish proper values and behavioral norms. Finally, schools should establish support systems, such as setting up psychological counseling centers, to provide timely assistance and psychological interventions for students affected by smartphone dependence.

Insights for Teachers

Teachers play a key role in managing smartphone use. They are not only transmitters of knowledge but also guides for students' psychological development. In classroom teaching, teachers should actively lead discussions on the pros and cons of smartphone use, stimulating students' thinking through case studies and group discussions. Teachers should also pay close attention to students' learning dynamics, identifying signs of academic procrastination and

smartphone dependence early, and take appropriate measures to intervene. For instance, teachers can hold one-on-one conversations with students to understand their mental state and learning difficulties, providing personalized support and advice. Outside the classroom, teachers should build strong relationships with students, becoming trusted confidants to help them alleviate stress and anxiety. Additionally, teachers should lead by example, demonstrating good time management and self-regulation skills, allowing students to be subtly influenced by positive role models. In short, teachers' guidance and support can effectively help students establish proper smartphone use habits, improving both their learning outcomes and mental health.

Insights for Students

Students must take responsibility when confronting the issue of smartphone dependence and develop effective self-management skills. Firstly, they should reflect on their smartphone usage habits and establish a reasonable plan, such as setting daily usage limits to ensure focused and efficient study time. Additionally, students should strengthen their time management abilities, appropriately balancing study and leisure time to avoid academic procrastination caused by excessive smartphone use. Seeking help during the learning process is also essential; leveraging support from teachers and peers can help overcome difficulties. Meanwhile, enhancing self-efficacy is a crucial strategy for students to resist smartphone temptations. By setting academic goals and gradually achieving self-challenges, students can make more rational choices when faced with the allure of smartphones, ultimately not only improving their academic performance but also contributing to a positive learning environment. These insights are significant for understanding the challenges students face in enhancing academic performance and expanding knowledge. In today's competitive job market, some students encounter difficulties in both their studies and career preparation. Students' proactive reflection and self-management skills are key to addressing smartphone dependence. Through these efforts, they can better balance academics and smartphone use, laying a solid foundation for future employment and personal development.

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