



**INTERNET ADDICTION, ACADEMIC BURNOUT, AND MEDIATING
FACTORS AMONG UNDERGRADUATES IN HEBEI, CHINA**



**Thesis Submitted to the School of Graduate Studies, Universiti Putra
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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

INTERNET ADDICTION, ACADEMIC BURNOUT, AND MEDIATING FACTORS AMONG UNDERGRADUATES IN HEBEI, CHINA

By

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November 2024

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Over the past 20 years, the degree of academic burnout among Chinese college students has gradually increased, which has a negative impact on students' learning effect, mental health and life quality, and it is almost synchronized with the growing problem of Internet addiction. Research has consistently demonstrated a significant positive correlation between Internet addiction and academic burnout. Hence, this study aimed to investigate how Internet addiction relates to academic burnout among undergraduates from normal universities in the Hebei province of China. Specifically, the research sought to: (1) assess the indirect effect of academic engagement and academic self-efficacy as mediators; and (2) examine the chain mediating effect of academic engagement and academic self-efficacy in the relationship between Internet addiction and academic burnout. The study also aimed to validate the psychometric properties of the Internet Addiction Test through factor analysis within the Chinese undergraduate context.

The research design of this study was descriptive and correlational research design. The stratified random sampling method was used as it can lower the risk of biases in the sample, minimize the chance of systematic errors, and create a more representative sample. A sample of 492 undergraduates (121 male and 371 female) from three normal universities participated in this study. Instruments used were Chinese version of Internet Addiction Test, Chinese version of Utrecht Work Engagement Scale-Student, Chinese version of Academic Self-efficacy Scale, and Learning Burnout Scale of Undergraduates. Data were collected using self-report questionnaires and Structural Equation Modelling was used to test the hypotheses using AMOS 24.0 software.

The results indicated that Internet addiction positively predicted academic burnout, while both academic self-efficacy and academic engagement negatively predicted academic burnout. Academic engagement had partial mediation effect in the relationship between Internet addiction and academic burnout. Academic self-efficacy mediated the relationship between Internet addiction and academic burnout independently. However, its mediation effect turned insignificant when academic engagement was involved in the model as a mediating variable. There was a significant chain mediating effect of academic engagement and academic self-efficacy in the relationship between Internet addiction and academic burnout.

These findings provide crucial insights into the sequential mechanism through which Internet addiction leads to academic burnout. The revealing of the chain

mediation effect is more meaningful than examining each mediator independently, as it demonstrates how the loss of one psychological resource (engagement) triggers the decline of another (self-efficacy), creating a loss spiral toward burnout. This cascade effect, supported by both the conservation of resources theory and self-efficacy theory, expands the scope of these theories' explanations of social phenomena. Moreover, the findings suggest implementing evidence-based interventions including establishing comprehensive digital wellness protocols incorporating Internet usage analytics, early detection systems, and personalized digital interventions via virtual coaches, may attenuate academic burnout, optimize learning outcomes, and enhance psychological well-being among students.

Keywords: Academic Burnout, Academic Engagement, Academic Self-efficacy, Internet Addiction

SDG: GOAL 3: Good Health and Well-Being

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

**KETAGIHAN INTERNET, KELESUAN AKADEMIK DAN FAKTOR
MEDIATOR DALAM KALANGAN PELAJAR SERJANA MUDA DI HEBEI,
CHINA**

Oleh

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Sepanjang 20 tahun yang lalu, tahap kelesuan akademik dalam kalangan pelajar kolej China telah meningkat secara beransur-ansur, yang memberi kesan negatif terhadap kesan pembelajaran pelajar, kesihatan mental dan kualiti hidup, dan ia hampir disegerakkan dengan masalah ketagihan Internet yang semakin meningkat. Penyelidikan secara konsisten menunjukkan korelasi positif yang signifikan antara ketagihan Internet dan kelesuan akademik. Oleh itu, kajian ini bertujuan untuk menyiasat bagaimana ketagihan Internet berkaitan dengan kelesuan akademik dalam kalangan pelajar dari universiti biasa di wilayah Hebei, China. Secara khusus, penyelidikan ini bertujuan untuk: (1) menilai kesan tidak langsung penglibatan akademik dan efikasi sendiri akademik sebagai mediator; dan (2) mengkaji kesan pengantaraan rangkaian penglibatan akademik dan efikasi sendiri akademik dalam hubungan antara ketagihan Internet dan kelesuan akademik. Kajian ini

juga bertujuan untuk mengesahkan sifat psikometrik Ujian Ketagihan Internet melalui analisis faktor dalam konteks sarjana China.

Reka bentuk kajian ini adalah reka bentuk penyelidikan kuantitatif dan korelasional. Kaedah persampelan rawak berstrata telah digunakan kerana ia boleh mengurangkan risiko bias dalam sampel, meminimumkan kemungkinan ralat sistematik dan mencipta sampel yang lebih representatif. Sampel seramai 492 mahasiswa (121 lelaki dan 371 perempuan) daripada tiga universiti biasa mengambil bahagian dalam kajian ini. Instrumen yang digunakan ialah Ujian Ketagihan Internet versi Bahasa China, Skala Penglibatan Kerja Utrecht-Pelajar versi Bahasa China, Skala Kecekapan Kendiri Akademik versi Bahasa China, dan Skala Burnout Pembelajaran Siswazah. Data dikumpul menggunakan soal selidik laporan sendiri dan Pemodelan Persamaan Struktur digunakan untuk menguji hipotesis menggunakan perisian AMOS 24.0.

Keputusan menunjukkan bahawa ketagihan Internet secara positif meramalkan kelesuan akademik, manakala kedua-dua efikasi kendiri akademik dan penglibatan akademik secara negatif meramalkan kelesuan akademik. Penglibatan akademik mempunyai kesan pengantaraan separa dalam hubungan antara ketagihan Internet dan kelesuan akademik. Efikasi kendiri akademik menjadi pengantara hubungan antara ketagihan Internet dan kelesuan akademik secara bebas. Walau bagaimanapun, kesan pengantaraannya menjadi tidak ketara apabila penglibatan akademik terlibat dalam model sebagai pembolehubah pengantara. Terdapat kesan

pengantaraan rantaian yang signifikan terhadap penglibatan akademik dan efikasi sendiri akademik dalam hubungan antara ketagihan Internet dan kelesuan akademik.

Penemuan ini memberikan pandangan penting tentang mekanisme berurutan di mana ketagihan Internet membawa kepada keletihan akademik. Pendedahan kesan pengantaraan rantaian adalah lebih bermakna daripada memeriksa setiap pengantara secara bebas, kerana ia menunjukkan bagaimana kehilangan satu sumber psikologi (penglibatan) mencetuskan kemerosotan yang lain (efikasi sendiri), mewujudkan lingkaran kerugian ke arah keletihan. Kesan lata ini, disokong oleh kedua-dua teori pemuliharaan sumber dan teori efikasi sendiri, meluaskan skop penjelasan teori ini tentang fenomena sosial. Selain itu, penemuan mencadangkan pelaksanaan intervensi berasaskan bukti termasuk mewujudkan protokol kesihatan digital yang komprehensif yang menggabungkan analisis penggunaan Internet, sistem pengesanan awal dan campur tangan digital yang diperibadikan melalui jurulatih maya, boleh mengurangkan kelesuan akademik, mengoptimumkan hasil pembelajaran, dan meningkatkan kesejahteraan psikologi dalam kalangan pelajar.

Kata Kunci: Efikasi Kendiri Akademik, Kelesuan Akademik, Ketagihan Internet, Penglibatan Akademik

SDG: MATLAMAT 3: Kesihatan dan Kesejahteraan yang Baik

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CHAPTER 1

INTRODUCTION

This chapter begins with an introduction to the study's background, which is followed by the problem statement. Subsequently, the research objectives, research questions, and research hypotheses are outlined correspondingly. Following that, a detailed illustration of the study's theoretical and practical implications is provided. Additionally, the study's limitations and scope are described. Lastly, conceptual and operational definitions of terms are presented.

1.1 Background of the Study

With the increasing popularity of the Internet, since the concept of Internet addiction was proposed in the 1990s, it has gradually become a global problem, with cross-cultural stability (Meng et al., 2022). The number of young people utilizing the Internet had a notable growth throughout the last ten years, particularly in China. As of June 2023, there were 10.79 billion netizens in China, of which students accounted for 33.7% (CNNIC, 2024). While the Internet has brought great convenience to students in learning knowledge, it also takes up a lot of time when they are immersed in online games and social software (Kozyreva et al., 2020; Wang et al., 2019).

Chinese undergraduate students face unique vulnerabilities to Internet addiction due to their distinctive campus environment. Living away from home throughout their academic years significantly reduces parental oversight of

their Internet usage. Unlike minors, these students (aged 18+) are exempt from national gaming restrictions, leaving their online activities largely unmonitored. While Internet access is essential for academic work like research and assignments, the inherently addictive design of online platforms poses significant risks (Kozyreva et al., 2020). Social media and gaming platforms employ sophisticated persuasive technologies, including variable reward schedules, infinite scrolling, and personalized content algorithms that trigger dopamine releases similar to those observed in substance addictions (Montag et al., 2021). University dormitory life, characterized by high autonomy and peer influence, creates an environment where students can easily spend excessive time on non-academic activities like gaming and social media (Xu, 2023). The absence of structured supervision, combined with constant Internet accessibility and the psychological pressures of academic life, makes Chinese undergraduates a high-risk target population for Internet addiction (Duc et al., 2024). This risk is further amplified by the collective living culture of Chinese universities, where peer Internet usage patterns can normalize excessive online behavior.

The transition to hybrid teaching models following the COVID-19 pandemic has fundamentally transformed higher education, introducing unique challenges at the intersection of Internet addiction and academic burnout. When traditional classroom instruction shifted to online platforms in early 2020, Chinese universities implemented extensive virtual instruction, establishing a lasting impact that persists beyond the pandemic period (Li et al., 2023). This

shift towards hybrid teaching—combining online and offline modalities—has become an irreversible trend in global higher education.

While hybrid learning environments offer enhanced flexibility and resource accessibility (Zhang & Liu, 2019), they simultaneously create conditions that may exacerbate Internet addiction and contribute to academic burnout through several mechanisms. First, the increased screen time necessitated by online learning components blurs the boundaries between academic and non-academic Internet use, making it particularly challenging for students with existing Internet addiction tendencies to maintain focus (Niu et al., 2023). The constant connectivity required for academic purposes provides continuous opportunities for non-academic online activities, potentially reinforcing addictive Internet behaviors.

The virtual learning environment's inherent characteristics—reduced teacher monitoring, limited real-time interaction, and decreased social presence—create additional vulnerabilities. Teachers struggle to capture students' real-time engagement through video interfaces limited to "big head photos," impeding their ability to detect and address student disengagement (Choi et al., 2021). This reduced oversight, combined with the multitasking possibilities of digital platforms, enables students to engage in non-academic online activities during virtual classes, potentially deepening Internet addiction patterns while simultaneously reducing academic engagement (Huang et al., 2023).

Furthermore, the hybrid learning environment introduces cognitive and technical demands that may contribute to academic burnout. Students must frequently switch between multiple electronic devices and learning platforms, managing various notification systems while maintaining attention across different learning modalities, which will produce a certain sense of boredom (Baskici et al., 2024). Technical challenges, including platform overload and connectivity issues, add another layer of stress. These factors, combined with the reduced social support and immediate feedback characteristic of traditional classroom settings (Baskici et al., 2024), contribute to the production of Internet addiction and academic burnout.

Research reveals that the decreased interpersonal interaction in online learning environments correlates with higher levels of academic burnout (Huang et al., 2023). This relationship appears to be mediated by reduced academic engagement and diminished self-efficacy, suggesting a complex interplay between the hybrid learning environment, Internet addiction, and academic burnout. The technical and cognitive demands of hybrid learning, coupled with the increased opportunities for problematic Internet use, create a particularly challenging environment for maintaining healthy academic engagement and preventing burnout.

The Conservation of Resources (COR) theory posits that individuals strive to obtain, retain, and protect resources they value while experiencing stress when these resources are threatened, lost, or inadequately replenished after investment (Hobfoll et al., 2018). In the academic context, students'

psychological resources—including time, energy, and attention—are finite and crucial for educational success. When these resources are excessively directed toward Internet use, it creates a resource depletion cycle: excessive Internet engagement consumes psychological resources that could otherwise be invested in academic activities, potentially triggering a spiral of resource loss. This depletion can manifest as reduced academic engagement and diminished academic self-efficacy, ultimately culminating in academic burnout. The theory suggests that resource loss is not only psychologically distressing but also breeds further resource depletion, as students with depleted resources become less capable of acquiring and maintaining new resources necessary for academic success. Building on this theoretical framework and incorporating self-efficacy theory, this study examines the relationship between Internet addiction and academic burnout among undergraduates from normal universities in the Hebei province of China, specifically investigating the mediating roles of academic engagement and academic self-efficacy in this relationship.

Normal students refer to those who receive education professional training and are willing to become teachers or work in education-related fields in the future (Dong et al., 2024). Normal universities are higher education institutions specifically designed to cultivate teachers and educators, who are equipped with excellent teaching skills, educational theory knowledge and research abilities. These universities offer undergraduate and graduate programs in education, psychology, preschool education, elementary education, secondary education and other related fields, and are committed to cultivating

students' practical teaching abilities. In addition to offering basic education majors, some normal universities also have special education, art education, sports education and other distinctive majors. After completing their professional studies, normal students usually need to participate in teacher qualification exams and other related exams, and obtain corresponding teacher qualification certificates before engaging in teaching work. They should shoulder the important responsibility of educating the next generation. The state of their mental health and their learning effect directly affects the quality of future education.

1.2 Problem Statement

The establishment of the research objectives stated earlier and the reason why focus on undergraduate students from normal universities are based on the following problems discovered in previous studies.

Firstly, numerous research conducted among undergraduate students in many countries found that the proportion of students who had academic burnout has increased gradually over the past 20 years. A meta-analysis investigated the changes in Chinese undergraduate students' academic burnout level from 2005 to 2017 and found that the academic burnout level of Chinese undergraduates has been growing year by year (Yu et al., 2020). And research in 2017 showed that this proportion was 7.4% (Al-alawi et al., 2017), and 33.4% in 2019 (Frajerman et al., 2019), which had increased to 39.29% in 2021 (Wang et al., 2021) and 44.26% in 2022 (Zhou et al., 2022). Up to now, previous research reported that 7.4% to 55.0% of undergraduates had

academic burnout, and it was universally recognized that more and more undergraduates are facing the problem of academic burnout.

Secondly, undergraduates from normal universities show higher academic burnout levels than other university students (Xia et al., 2020), a trend with significant implications for educational quality. Their increased vulnerability stems from unique dual pressures: mastering both subject knowledge and pedagogical skills while meeting strict professional standards (Li, 2010). This elevated burnout risk is particularly crucial given their future role as teachers, as their experiences may affect their teaching effectiveness and emotional resilience. Research shows burned-out teachers demonstrate reduced teaching quality and classroom management skills (Xia et al., 2020). Additionally, academic burnout links to mental health issues (Ma, 2024), potentially creating a cycle where distressed future teachers struggle to foster positive learning environments. Despite these implications for educational quality and the teacher pipeline, there remains a notable gap in research examining burnout among Chinese normal university students.

Thirdly, the parallel rise of academic burnout and Internet addiction among Chinese undergraduates suggests a complex interrelationship between these phenomena. Internet addiction operates through multiple mechanisms to potentially exacerbate academic burnout. Students engaging in excessive online activities, even during classes and homework sessions, experience cognitive resource depletion, attention fragmentation, and disrupted sleep patterns, directly undermining their academic performance (Tindell &

Bohlander, 2012). The prevalence of Internet addiction has shown an alarming annual increase of 7.54% from 1999 to 2021, with Chinese undergraduates exhibiting the highest rate (13.8%) compared to their counterparts in Japan, Singapore, and the United States (Duc et al., 2024; Meng et al., 2022). This trend has been further accelerated by the COVID-19 pandemic. While these statistics suggest a correlation between Internet addiction and academic burnout, there remains a significant gap in understanding this relationship specifically within the context of normal universities.

Fourthly, the relationship between Internet addiction and academic burnout likely operates through a complex chain of psychological mechanisms involving academic engagement and self-efficacy. While previous studies have examined these variables in isolation, a comprehensive chain mediation model is essential to understand their interactive effects. This approach is particularly crucial because Internet addiction may simultaneously deplete multiple psychological resources: it can directly reduce academic engagement through time displacement and attention division, while also undermining academic self-efficacy through repeated experiences of academic underperformance. These depleted resources may then synergistically contribute to academic burnout, following the resource conservation principle (Hobfoll et al., 2018). Understanding this chain mechanism is vital for developing effective interventions, yet current research lacks an integrated examination of how these variables interact collectively in the pathway from Internet addiction to academic burnout.

Another research gap comes from theoretical foundations. COR theory posits that psychological stress occurs when individuals face resource loss, threat of resource loss, or insufficient resource gain following resource investment (Hobfoll et al., 2018). This framework is particularly relevant for understanding academic burnout in the context of Internet addiction because it explains how excessive Internet use creates a resource loss spiral (Hobfoll et al., 2018): students invest their limited cognitive and temporal resources in non-academic online activities, leading to reduced academic engagement and diminished self-efficacy, which further depletes their psychological resources for academic tasks. The revealing of the chain mediation effect is more meaningful than examining each mediator independently, as it demonstrates how the loss of one psychological resource (engagement) triggers the decline of another (self-efficacy), creating a loss spiral toward burnout. While COR theory has been successfully applied to explain job burnout and Internet addiction relationships (Hobfoll et al., 2018), its application to academic burnout, particularly examining the mediating roles of academic engagement and academic self-efficacy, remains underexplored. Understanding this theoretical mechanism is crucial for developing targeted interventions that address the resource loss cycle and help students maintain the psychological resources necessary for academic success.

Finally, the Internet Addiction Test (IAT), despite its widespread use in China, requires critical revision to address cultural and contextual specificity for Chinese undergraduate populations. Several items in the current IAT reflect Western Internet use patterns and fail to capture unique aspects of Chinese

digital culture of undergraduates, such as the use of email. Moreover, the expression such as 'intimacy with your partner' is not suitable for the target population of this study. Additionally, the factor structure of the IAT has shown remarkable inconsistency across cultural contexts, varying from one to six factors (Lai et al., 2013). This structural instability may reflect both cultural differences in Internet use patterns and the rapid evolution of digital technologies since the IAT's development. Furthermore, there is a lack of systematic examination of its structure based on contemporary Chinese undergraduate students. Therefore, a systematic revision of the IAT's items and examination of its structure is essential to ensure its validity and reliability for contemporary Chinese undergraduate populations.

Before examining the relationships between Internet addiction and academic burnout, it is methodologically crucial to establish that the primary measurement instrument accurately captures Internet addiction within the specific population context. The inconsistent factor structures found across different cultural contexts raise concerns about measurement invariance and construct validity. By conducting both Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA), it can be established a psychometrically sound foundation for subsequent analyses of the relationships between variables. This validation ensures that the findings regarding the relationships between Internet addiction, academic burnout, engagement, and self-efficacy are based on culturally appropriate and statistically reliable measurements, thereby strengthening the overall validity of the conclusions.

1.3 Research Objectives

This study aimed to investigate the relationship between Internet addiction and academic burnout of undergraduates from normal universities in the Hebei province of China, and the mediating effect of academic engagement and academic self-efficacy in the relationship between them. Thus, the research objectives are listed as follows:

1. To identify the level of Internet addiction, academic engagement, academic self-efficacy, and academic burnout among Hebei undergraduates.
2. To verify the structure of IAT through Exploratory Factor Analysis (EFA) and confirm its structure with Confirmatory Factor Analysis (CFA) among Hebei undergraduates.
3. To determine the effect of Internet addiction on academic burnout among Hebei undergraduates.
4. To determine the effect of Internet addiction on academic engagement among Hebei undergraduates.
5. To determine the effect of academic engagement on academic burnout among Hebei undergraduates.
6. To determine the mediating effect of academic engagement in the relationship between Internet addiction and academic burnout among Hebei undergraduates.
7. To determine the effect of Internet addiction on academic self-efficacy among Hebei undergraduates.

8. To determine the effect of academic self-efficacy on academic burnout among Hebei undergraduates.
9. To determine the mediating effect of academic self-efficacy in the relationship between Internet addiction and academic burnout among Hebei undergraduates.
10. To determine the effect of academic engagement on academic self-efficacy among Hebei undergraduates.
11. To determine the chain mediating effect of academic engagement and academic self-efficacy in the relationship between Internet addiction and academic burnout among Hebei undergraduates.

1.4 Research Questions

Based on the research objectives, the research questions that are aspired to be addressed by the study are as follows:

1. What is the level of Internet addiction, academic engagement, academic self-efficacy, and academic burnout among Hebei undergraduates?
2. What is the structure of IAT based on EFA and CFA among Hebei undergraduates?
3. Does Internet addiction have a significant effect on academic burnout among Hebei undergraduates?
4. Does Internet addiction have a significant effect on academic engagement among Hebei undergraduates?

5. Does academic engagement have a significant effect on academic burnout among Hebei undergraduates?
6. Is there a significant mediating effect of academic engagement in the relationship between Internet addiction and academic burnout among Hebei undergraduates?
7. Does Internet addiction have a significant effect on academic self-efficacy among Hebei undergraduates?
8. Does academic self-efficacy have a significant effect on academic burnout among Hebei undergraduates?
9. Is there a significant mediating effect of academic self-efficacy in the relationship between Internet addiction and academic burnout among Hebei undergraduates?
10. Does academic engagement have a significant effect on academic self-efficacy among Hebei undergraduates?
11. Is there a significant chain mediating effect of academic engagement and academic self-efficacy in the relationship between Internet addiction and academic burnout among Hebei undergraduates?

1.5 Research Hypothesis

This study aims to determine the relationships between Internet addiction and academic burnout among undergraduates from normal universities in the Hebei province of China, and the mediating effects of academic engagement and academic self-efficacy between them. Specifically, this research aims to test the following hypothesis:

Ha1: Internet addiction has a significant effect on academic burnout.

Ha2: Internet addiction has a significant effect on academic engagement.

Ha3: Academic engagement has a significant effect on academic burnout.

Ha4: There is a significant mediating effect of academic engagement in the relationship between Internet addiction and academic burnout.

Ha5: Internet addiction has a significant effect on academic self-efficacy.

Ha6: Academic self-efficacy has a significant effect on academic burnout.

Ha7: There is a significant mediating effect of academic self-efficacy in the relationship between Internet addiction and academic burnout.

Ha8: Academic engagement has a significant effect on academic self-efficacy.

Ha9: There is a significant chain mediating effect of academic engagement and academic self-efficacy in the relationship between Internet addiction and academic burnout.

1.6 Significance of the Study

Research should have a contribution to the body of knowledge in the field of study. The contribution of this study will be explained below from perspectives of theoretical significance and practical significance.

1.6.1 Theoretical Significance

This study advances theoretical understanding in several key ways. First, it extends Conservation of Resources (COR) theory from occupational to academic contexts by examining how Internet addiction triggers resource depletion processes specifically among university students. The COR theory

frames Internet addiction as a resource-depleting process where excessive online engagement drains students' psychological and temporal resources. This depletion triggers a loss spiral, ultimately culminating in academic burnout as students struggle to replenish their depleted resources and face academic stress (Hobfoll et al., 2018). While COR theory has been applied to job burnout and Internet addiction, its application to academic burnout, particularly among normal university students, represents a crucial theoretical extension. This population faces unique resource demands—balancing academic achievement with pedagogical training—making them an ideal context for testing COR theory's explanatory power in educational settings.

Second, this study introduces a novel theoretical framework by proposing and testing a chain mediation model that integrates academic engagement and self-efficacy as sequential mediators. Previous research has examined these variables in isolation, limiting our understanding of their interactive effects in the Internet addiction-burnout relationship. By investigating their sequential mediation, this study illuminates the psychological mechanisms through which Internet addiction depletes students' resources: initially reducing academic engagement, which subsequently diminishes self-efficacy, ultimately leading to burnout.

This integrated approach addresses a significant gap in existing literature, which has largely overlooked the cumulative and interactive effects of these variables, advancing theoretical understanding of resource dynamics under COR theory in the context of academic burnout. The revealing of the chain

mediation effect is more meaningful than examining each mediator independently, as it demonstrates how the loss of one psychological resource (engagement) triggers the decline of another (self-efficacy), creating a loss spiral toward burnout. This cascade effect, supported by both the conservation of resources theory and self-efficacy theory, expands the scope of these theories' explanations of social phenomena.

Furthermore, by focusing on normal university undergraduates, this study examines how COR theory's resource conservation principles operate within a population facing distinct academic and professional development pressures. This context provides unique insights into how resource depletion processes may differ in educational settings compared to occupational contexts, contributing to the theoretical refinement of COR theory's application in academic environments.

1.6.2 Practical Significance

The theoretical insights from this study's COR-based chain mediation model translate into several actionable interventions for educational practice. By understanding how Internet addiction depletes academic resources through reduced engagement and self-efficacy, universities can develop targeted support systems that address each stage of this depletion cycle.

Specifically, this research informs the development of evidence-based interventions in hybrid learning environments. These might include implementing structured digital wellness programs, integrating mindful

technology use into curriculum design, and developing early warning systems to identify students at risk of Internet addiction and academic burnout. Universities could establish dedicated time management workshops, digital literacy training, academic resilience training, and peer support networks specifically tailored to the unique challenges faced by normal university students managing both academic and pedagogical training demands.

The implications extend beyond immediate academic performance to the broader educational ecosystem. As future teachers, normal university students will significantly influence the next generation's learning experiences. By addressing their Internet addiction and academic burnout challenges now, they can be better prepared for the technological demands of modern teaching and improve their teaching effectiveness and student engagement while maintaining their psychological well-being. This preparation is crucial as these future educators will need to guide their own students in navigating digital learning environments effectively. Universities can support this by integrating stress management, digital literacy, and self-efficacy training into teacher preparation programs.

Furthermore, findings from this study can inform institutional policy development, such as implementing balanced technology use guidelines, restructuring online course delivery methods, and establishing support systems that promote healthy engagement with digital resources. These practical applications are particularly timely given the increasing prevalence of

hybrid learning models and the growing importance of digital literacy in education.

1.7 Scope and Limitation of Study

1.7.1 Research Scope

The unit of analysis and the research context are used to explain the scope of the study. For the research context, this study aims to investigate the effect of Internet addiction on academic burnout among Chinese normal undergraduates, and its internal mechanism based on online and offline hybrid learning context after COVID-19. This context is particularly significant as it represents a fundamental shift in educational delivery, where traditional face-to-face instruction is systematically integrated with online learning components, creating unique challenges for student engagement and resource management. The hybrid model, characterized by synchronous online lectures, asynchronous digital assignments, and in-person practical training, requires students to navigate between physical and virtual learning spaces continually. This educational context intensifies students' dependency on digital platforms while simultaneously demanding heightened self-regulation skills to manage online distractions. Moreover, the post-COVID-19 learning environment has normalized extensive screen time for academic purposes, potentially blurring the boundaries between essential online academic activities and problematic Internet use. This context provides a crucial setting for understanding how the increased integration of digital technologies in education may influence the relationship between Internet addiction and

academic burnout, particularly among normal university students who must develop both digital teaching competencies and healthy technology use habits.

The study's subject scope is restricted to undergraduates from normal universities in the Hebei province of China without serious psychiatric diseases. Normal colleges and universities are a special existence of higher education in China because many colleges and universities with a long history have almost evolved from normal colleges and universities. At present, there are 118 normal universities in China. Generally, the name of such colleges and universities has the word "normal". These colleges and universities have multiple majors including pedagogy and psychology, which are compulsory courses for the students of all normal majors. Its main training goal is to enable students to be competent as teachers in kindergartens, primary schools and middle schools after graduation. This type of university is also available in other countries around the world (Lei, 2021). The number of undergraduate students from normal universities enrolled each year reaches 430,000, accounting for nearly 10% of the total enrollment in China.

Hebei province offers a uniquely valuable context for studying Internet addiction and academic burnout among normal university students for several compelling reasons. As the birthplace of China's normal university system, Hebei's institutions represent diverse academic tiers, with admission scores varying significantly across universities. This stratification provides an ideal research setting, particularly given the established negative correlation between admission scores and academic burnout susceptibility (Xie & Xiao,

2022). Moreover, normal university students in Hebei face distinct challenges that may amplify their vulnerability to Internet addiction and burnout compared to other university students: they must simultaneously master subject knowledge, develop pedagogical skills, and meet rigorous professional certification standards (Li, 2010).

The pressure on these students is further intensified by Hebei's rapid educational digitalization: they must develop digital teaching competencies while maintaining high academic performance standards. This combination of factors creates a particularly high-risk environment for Internet addiction and academic burnout. A previous study showed that the academic burnout situation of undergraduates from normal universities is more serious than those from other types of universities (Xia et al., 2020). Hence, this study aims to focus on the academic burnout of undergraduate students from normal universities.

This provincial context mirrors broader national educational dynamics, as Hebei's rapid digitalization of education reflects nationwide efforts to integrate technology into pedagogy, creating comparable pressures across China's tertiary institutions. While findings are context-specific, the mechanisms underpinning resource depletion (via Internet addiction) and compensatory processes (via academic engagement and self-efficacy) align with COR theory's universal principles, suggesting applicability to regions with similar academic pressures and digital transition challenges. Internationally, normal universities exist across educational systems, and insights into mediating

pathways may inform interventions in comparable contexts where digital competencies intersect with high-stakes professional preparation. By anchoring the study in Hebei's representative yet unique context, we balance ecological validity with theoretical generalizability, offering a model for regionally tailored yet globally relevant investigations into digital-era academic well-being.

1.7.2 Research Limitation

Because the data was collected by questionnaire survey, it relied heavily on the self-report of the participants, which presents several methodological limitations. Their self-report may not be as accurate as the actual situation because of the social approval effect, which refers to the psychological phenomenon where individuals seek and value social approval or recognition from others, and their answers may tend to be less serious than the real situation. Beyond the social desirability bias, other potential sources of bias could affect data accuracy. These include recall bias, where participants may inaccurately remember or report past behaviors and experiences, and response bias, where participants might systematically over- or under-report certain behaviors, which may affect the accuracy of reported Internet use and burnout levels.

When the representative sample size is relatively large, this threat may be weakened. Therefore, to mitigate these limitations, a sufficient representative sample was selected for this study, which exceeds the minimum sample size requirement for structural equation modeling. The large sample size enhances

reliability by reducing sampling error, enhancing statistical power and the precision of parameter estimates, increasing generalizability, and ensuring robust conclusions about the relationships between Internet addiction, academic engagement, self-efficacy, and burnout while also allowing for a more robust analysis of subgroup variations and potential confounding variables. Additionally, the stratified random sampling approach across different university tiers ensures demographic and academic diversity, thereby increasing the generalizability of the findings.

While the large representative sample may partially mitigate these limitations, future research would benefit from a multi-method approach. For instance, incorporating objective behavioral tracking data (e.g., screen time logs, online activity patterns), ecological momentary assessments, or third-party evaluations (such as academic records or teacher assessments) could provide more robust validation of self-reported measures. Additionally, implementing longitudinal designs with repeated measures could help minimize recall bias and better capture temporal patterns in Internet use and academic engagement. These methodological triangulation strategies would enhance the validity and reliability of findings in future studies examining similar phenomena.

1.8 Definition of Terms

To give a clear understanding of how this study is being conducted, the terms involved in it are defined both conceptually and operationally.

1.8.1 Internet Addiction

Internet addiction, initially conceptualized by Young (1998b) as the impulse control disorder of Internet behavior without addictive substances, which is marked by a clear degradation of a person's social and psychological functioning brought on by excessive Internet use. Its typical characteristics include significant symptoms, increased tolerance, emotional change, withdrawal symptoms, intense psychological conflict, and recurrent attacks. Contemporary research conceptualizes it as a maladaptive pattern of Internet usage characterized by impaired executive control, resulting in significant deterioration across multiple domains including psychological well-being, emotional regulation, social functioning, and academic achievement (Saadati et al., 2021). Although there are subtle differences between these definitions, their essence is the same, and they all define Internet addiction as a disorder of psychological and social functioning caused by excessive use of the Internet.

Young (1998a) proposed the ACE (Accessibility-Control-Excitement) model to explain the causes of Internet addiction. The ACE model posits that Internet addiction develops through three key mechanisms: accessibility (constant availability of online content), control (perceived mastery over the online environment), and excitement (psychological reward from Internet use). This foundation has been enriched by I-PACE model (Brand et al., 2016), which integrates neurobiological, psychological, and social factors to explain the development and maintenance of problematic Internet use. Young (1998a) coined the Internet Addiction Test (IAT) based on the ACE model, which is a

widely validated assessment tool and is used to assess the state of Internet addiction among undergraduates in this study.

In this study, Internet addiction is defined operationally as the level of scores obtained by the participants on the Chinese version of Internet Addiction Test (IAT). The Chinese version of IAT was revised by Chinese scholars based on a sample of middle school students and university students (Cao et al., 2010). It was specifically selected for its validated psychometric properties in the Chinese cultural context and its assessment of compulsive usage and functional impairment aligns with COR theory's emphasis on resource depletion, making it theoretically apt for capturing Internet-related cognitive-emotional losses.

Some items were adapted while maintaining their conceptual equivalence with the original scale and the structure of the IAT was tested among undergraduates from normal universities. First, Item 3's reference to "intimacy with your partner" was modified to "spending time with close friends," acknowledging the social dynamics and relationship patterns typical of university students. Second, considering contemporary Internet usage patterns among Chinese undergraduates and following observation that email checking is no longer a reliable indicator of problematic Internet use (Jelenchick et al., 2012), Item 7 was revised from "checking email" to "chatting or hanging out on the Internet." This modification better reflects current online behavioral patterns among university students. Third, Item 14 was refined from "losing sleep due to being online" to "surfing the Internet until late at night

without going to bed," as it indicated that the issue was not clinical insomnia but rather a voluntary delay of bedtime due to Internet use. Finally, Item 19 was modified from "others" to "friends" when assessing social withdrawal tendencies, as the rejection of peer relationships represents a more sensitive indicator of problematic Internet use in the undergraduate context. All modifications underwent back-translation and expert validation to ensure conceptual and measurement equivalence with the original scale while improving its ecological validity for the target population.

1.8.2 Academic Burnout

Academic burnout is characterized by negative attitudes and behaviors related to fatigue from studying that result from pressure or a lack of interest in learning (Lian et al., 2005). This definition is based on the three-dimensional model of job burnout (emotional exhaustion, depersonalization, low sense of accomplishment), which is also the theoretical basis of the scale named Maslach Burnout Inventory (MBI) (Maslach et al., 1997), which is revised based on the Chinese undergraduate sample (Lian et al., 2005).

In this study, academic burnout is defined operationally as the scores obtained by the participants on the Learning Burnout Scale of Undergraduates (LBSU), which was developed by Lian et al. (2005), and chosen for its development specifically within the Chinese higher education context. The scale includes 20 items and covers three subscales including low mood, inappropriate behavior, and low sense of accomplishment. Each item was rated from 1 to 5. The sum of the scores of the three dimensions equals the total scale score. The higher

the scores, the heavier the academic burnout. A mean item score equal to or more than 3 also means academic burnout. LBSU was used in numerous studies for measuring academic burnout of students and the threshold score of ≥ 3.0 for indicating burnout was established through normative studies in Chinese undergraduate populations (Yu et al., 2020). This cutoff demonstrates strong discriminant validity in distinguishing between normal academic stress and clinically significant burnout symptoms.

1.8.3 Academic Engagement

Schaufeli et al. (2002) defined academic engagement from the perspective of psychology and pointed out that academic engagement referred to the positive and enthusiastic learning attitude, abundant learning energy, good learning toughness and full immersion shown by individuals in the learning process and it was marked by vigor, dedication and absorption. The initial theoretical basis of this concept is the three-dimensional theory of work engagement proposed by Maslach et al. (2001), who divides work engagement into three dimensions including energy, involvement, and efficacy.

Academic engagement is defined operationally as the scores obtained by the participants on the Chinese version of Utrecht Work Engagement Scale-Student (UWES-S). Schaufeli developed the scale based on the Work Engagement Scale (UWES) and taking college students as samples (Schaufeli et al., 2002). Scholars revised it based on a sample of Chinese college students (Li & Huang, 2010). This instrument was selected for its robust cross-cultural validation and specific validation for Chinese university

students. The scale has three dimensions, which are vigor, dedication and absorption. The total scale score is equal to the sum of the scores of the three dimensions. There are 17 items and each of them is scored with 7 point-Likert scale. A frequency of 1 indicates "never," while a frequency of 7 indicates "always / every day." Higher scores indicate greater academic engagement. The 7-point Likert scale was retained from the original instrument based on validation studies demonstrating optimal sensitivity and discrimination in capturing the full range of engagement levels among Chinese university students, with superior psychometric properties.

1.8.4 Academic Self-efficacy

Academic self-efficacy, rooted in social cognitive theory (Bandura, 1977), which has been known as a person's confidence in their ability to successfully complete a task at a given level or reach a particular academic objective. Contemporary theoretical frameworks conceptualize it as learners' domain-specific cognitive appraisals of their capabilities to execute academic tasks and achieve desired educational outcomes (Honicke & Broadbent, 2016). Pintrich & DE Groot (1990) developed the Academic Self-Efficacy Scale (ASS), which includes 9 items. Liang (2004) revised it based on Chinese undergraduate students, which is used in this study.

The theoretical foundation of academic self-efficacy is the self-efficacy theory proposed by Bandura, which emphasizes the subjective feelings of individuals about their abilities and posits that self-efficacy develops through four primary sources: mastery experiences, vicarious experiences, social persuasion, and

physiological states (Bandura, 1977). Recent theoretical developments by Schunk & DiBenedetto (2022) have expanded this framework to include domain-specific aspects of academic self-efficacy, emphasizing how different academic contexts and tasks influence efficacy beliefs. This expanded theoretical framework also accounts for the cyclical nature of self-efficacy development, where performance outcomes feed back into future efficacy beliefs through self-regulatory processes.

Academic self-efficacy is defined operationally as the scores obtained by the participants on ASS in this study. Two complementary dimensions that together comprehensively assess students' academic self-efficacy (Liang, 2004). The total academic self-efficacy score is calculated by summing scores across both dimensions, which are learning ability self-efficacy (LAS) and learning behavior self-efficacy (LBS), with higher scores indicating stronger overall academic self-efficacy. The scale has 22 items, and each dimension has 11 items. The scale is scored at 5 points as Likert scale, with 1-5 points from "completely inconsistent" to "completely consistent". Higher scores indicate stronger perceived academic self-efficacy, with demonstrated predictive validity for academic performance in Chinese undergraduate populations. This scale was selected for its comprehensive coverage of both cognitive and behavioral aspects of academic self-efficacy, particularly relevant for understanding self-regulated learning in the Chinese higher education context.

1.9 Chapter Summary

This chapter begins with an introduction to the research background, followed by the statement of problem. Then, the research objectives, research questions and research hypotheses are introduced. Finally, the research scope, research significance, limitations of this study and definition of the terms involved in the study are illustrated. Based on the illustration, the relevant research findings in the previous studies are reviewed in the following chapter.



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