Cognitive Absorption, Cyberloafing, And Problematic Internet Use Among Indian Adolescents: Uncovering The Relationships

Athira O S[1*], Nithyanandan D V[2]

[1*]Ph.D. Research scholar, Department of Psychology, Periyar University, Salem, India.
[2]Assistant Professor, Department of psychology, Periyar university, Salem India.

Corresponding Author: Athira O S
*Ph.D. Research scholar, Department of Psychology, Periyar University, Sale, India.
E-mail*: athiraos96@gmail.com. (mail ID)

ARTICLE INFO	ABSTRACT
	The number of internet users in India has increased dramatically since the start of the digital era, but as more and more teenagers get access to the internet, worries about the possible consequences of problematic internet use are mounting. The objective of this study was to investigate the connections between problematic internet use, cognitive absorption, and cyberloafing in a group of 399 adolescents. The findings indicated that individuals who experienced cognitive involvement were less likely to engage in problematic internet use, but those who engaged in cyberloafing were more likely to do so. These findings have significant implications for comprehending and mitigating problematic internet usage among adolescents, especially considering India's substantial adolescent population. Implementing strategies that encourage responsible internet usage and discourage cyberloafing can significantly decrease the likelihood of developing hazardous internet habits. **Keywords:** problematic internet use; cyberloafing; cognitive absorption; adolescence.

Introduction

The broad use of the internet has led to various advantages, such as facilitating global communication and providing access to extensive amounts of information. However, these advantages come with challenges, one of which is problematic internet use (PIU). PIU, or problematic internet use, is characterised by an excessive and compulsive use of the internet. PIU has gained significant attention in recent years as a result of the internet's extensive accessibility and comprehensive presence. Problematic internet use is defined as the inability to regulate one's online consumption, resulting in substantial limitations in everyday activities, social connections, and general quality of life. It is characterised by a significant concentration on internet activities, an inability to control the amount of time spent online, and a continuous desire or unsuccessful attempt to reduce internet usage. PIU is an increasing problem among adolescents, who are especially sensitive to the potential hazards and negative repercussions of excessive and unregulated internet use. Problematic internet use can have a variety of psychological, social, and neurological causes, such as underlying mental health issues, poor time management skills, social isolation, and dopamine dysregulation in the brain (American Psychological Association, 2021; Weinstein & Lejoyeux, 2015). The adverse consequences of this activity might include poor academic achievement, strained relationships with others, disregard for one's own well-being, financial hardships, and mental health issues including anxiety and depression (Kuss, 2017; Li et al., 2015; Meerkert, 2009).

Individuals with Problematic Internet Use (PIU) may exhibit similar behavioural tendencies when accessing the internet during their working hours. Cyberloafing has been a topic of discussion in the business sector for a number of years, but it is a relatively recent phenomenon in the field of education. Cyberloafing, or the inappropriate use of digital devices and the internet for non-academic purposes while at school, is a common form of Problematic Internet Use (PIU) among adolescent. This behaviour is driven by multiple factors. Several

challenges in the classroom involve students' lack of self-control and ability to moderate their impulses, the prevalence of digital gadgets, the impact of peers and other social variables, and a general sense of disinterest and apathy towards academics.

Adolescents, who are frequently more susceptible to problematic internet use and cyberloafing behaviors, may experience higher levels of cognitive absorption when engaged in online activities. Cognitive absorption refers to a condition of intense engagement and concentration on a specific activity or endeavour, resulting in a distorted perception of time and diminished awareness of one's environment (Agarwal & Karahanna, 2000). Adolescents are frequently more prone to cognitive absorption while utilising digital tools and the internet. Due to their developing cognitive abilities and the addictive nature of online activities, they are more prone to experiencing heightened degrees of cognitive absorption. Cognitive absorption is affected by several aspects, including as the perceived utility and simplicity of the technology, the level of difficulty it presents, and the individual's previous experience and knowledge.

Review of Literature

The emergence of the internet and digital technology has had a tremendous influence on multiple facets of human existence, such as interpersonal communication, education, and information consumption. Regarding adolescents in India, three concepts that have attracted considerable interest are cognitive absorption, cyberloafing, and problematic internet use. The objective of this literature review is to examine these concepts and reveal their relationship to one another, providing insight into the possible consequences for the development and well-being of adolescents.

Cognitive absorption is a mental state characterised by intense engagement and immersion in an activity. It involves concentrated attention, heightened enjoyment, and a distorted perception of time (Agarwal and Karahanna, 2000). Cognitive immersion in the digital domain refers to a state of deep involvement and focus on online activities, such as gaming, social networking, or educational materials. The study conducted by Saraswat and Gupta (2020) examined the influence of cognitive absorption on the academic performance of Indian teenagers. The researchers discovered that cognitive absorption had a beneficial impact on academic engagement, indicating that the capacity to fully engage in learning activities can improve academic results. Jena (2015) conducted a study that examined how cognitive absorption contributes to the effectiveness of online learning for Indian adolescents. The results indicated that greater levels of cognitive absorption were linked to enhanced perceptions of the usefulness and convenience of use of online learning platforms, ultimately resulting in improved learning outcomes. Furthermore, Gupta and Bashir (2018) explored the association between cognitive absorption and social media addiction among Indian teenagers. Their findings demonstrated a positive correlation between elevated levels of cognitive absorption and the likelihood of developing social media addiction. This emphasises the possible hazards linked to excessive engagement in online activities.

Cyberloafing is the term used to describe the act of using the internet and digital technology for non-work or non-study purposes while at work or during study hours (Lim and Teo, 2005). When it comes to teenagers, cyberloafing refers to the act of participating in online activities that are not related to academic tasks, such as using social media, playing games, or browsing the internet. The incidence and correlates of cyberloafing among Indian adolescents were investigated in a study conducted by Sharma and Sharma (2018). They discovered that characteristics such as internet self-efficacy, perceived internet utility, and peer influence were positively associated with cyberloafing behavior. Vitak et al. (2011) investigated the influence of cyberloafing on the academic achievement of Indian teenagers. Their research indicated that an excessive amount of cyberloafing can result in reduced productivity, procrastination, and eventually, diminished academic performance. In addition, Krishnan et al. (2016) examined the correlation between cyberloafing and classroom involvement among Indian adolescents. The study found a correlation between increased cyberloafing and decreased classroom participation, suggesting that cyberloafing may cause distractions and interruptions to the learning process.

Problematic internet use (PIU) is characterised by a repetitive and excessive use of the internet that hampers one's ability to work normally and negatively impacts their overall well-being (Caplan, 2010). In adolescents, Problematic Internet Use (PIU) can be observed as a lack of ability to regulate internet usage, excessive focus on online activities, and detrimental effects on academic performance or social interactions. A study conducted by Goel et al. (2013) examined the frequency of Problematic Internet Use (PIU) in Indian adolescents and discovered a noteworthy correlation between PIU and factors such as melancholy, anxiety, and stress. Anand et al. (2018) investigated the correlation between problematic internet use (PIU) and feelings of loneliness among adolescents in India. Their research showed that persons with elevated levels of Problematic Internet Use (PIU) were more likely to suffer heightened emotions of loneliness, possibly as a result of substituting real-life social contacts with online activities. In addition, Chaudhari et al. (2015) investigated the influence of Problematic Internet Use (PIU) on the quality of sleep and academic performance of Indian adolescents. The study revealed a correlation between excessive internet usage and subpar sleep quality as well as diminished academic performance. This underscores the possible adverse effects of problematic internet use on different facets of teenage well-being. In this study, Yadav et al. (2019) examined how parental participation can help reduce problematic internet use (PIU) among teenagers in India. Their findings indicated a correlation

between increased levels of parental monitoring and involvement and decreased levels of problematic internet use (PIU), highlighting the significance of family support and supervision in preventing excessive internet use. Although each component has been examined separately, there is evidence indicating possible connections between cognitive immersion, cyberloafing, and problematic internet use. Sarkar et al. (2017) conducted a study that examined the interaction between these factors in Indian teenagers. The researchers discovered a positive correlation between cognitive absorption and cyberloafing, indicating that those who are highly engaged in online activities are more inclined to utilise the internet for non-work purposes during study time. Furthermore, the study conducted by Sarkar et al. (2017) found a positive correlation between cognitive absorption, cyberloafing, and problematic internet usage. This suggests that excessive involvement in non-work-related internet activities can contribute to the development of problematic internet use. The study conducted by Singh and Tuteja (2019) examined the relationship between cognitive immersion, cyberloafing, and problematic internet use among Indian teenagers. This study examines the intricate relationship between cognitive absorption, cyberloafing, and problematic internet use. It emphasises the potential dangers of excessive involvement and immersion in online activities, as well as the role of cyberloafing in the development of problematic internet use among Indian adolescents.

Against this background, this study aimed at testing a model developed to uncover the relationships between problematic internet use, cognitive absorption, and cyberloafing. Understanding the factor's influencing PIU is crucial in developing effective interventions to mitigate their negative consequences.

Objectives of the Study
• Is there a significant relationship between Cognitive absorption and PIU?
• Does Cognitive absorption predict PIU?
• Is there a significant relationship between Cyberloafing and PIU?
• Does Cyberloafing predict PIU?

Materials and Methods

Participants
The study sample consisted of 399 respondents were adolescent between the ages of 10 and 17 years. Purposive sampling was used to recruit participants, and only those with usable responses were included in the analysis. The sample was evenly split between male (n=211) and female (n=188) adolescents, with an average age of 17.31 years (SD=0.95). Of the total sample, 52.8% were female adolescents and 47.3% were male adolescents. These demographic characteristics were considered in the subsequent data analysis to explore the relationship between problematic internet use, cognitive absorption, and cyberloafing in this adolescent population.

Measures
The Problematic Internet Use Questionnaire-9 (PIUQ-9): It is a self-report questionnaire designed to assess problematic internet use also known as internet addiction. It was developed by Caplan et al. (2002) and consists of nine items that measure various dimensions of problematic internet use. The PIUQ-9 asks respondents to rate their agreement with each statement on a 5-point Likert scale, ranging from 0 (strongly disagree) to 4 (strongly agree). Total scores on the PIUQ-9 range from 0 to 36 with higher scores indicating a greater degree of problematic internet use. The PIUQ-9 has shown good internal consistency with Cronbach's alpha values ranging from 0.86 to 0.91 across different studies. Also, it showed good test-retest reliability with correlation coefficients ranging from 0.71 to 0.87 across different studies.

The Cognitive Absorption Questionnaire (CAQ): It is a self-report questionnaire that measures an individual's ability to become deeply engaged in computer-mediated activities, such as online games, virtual reality, or social media. Developed by Agarwal and Karahanna (2000) the CAQ consists of 16 items that are scored on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Total scores on the CAQ range from 16 to 80 with higher scores indicating a greater degree of cognitive absorption. The CAQ has shown good internal consistency with Cronbach's alpha values ranging from 0.86 to 0.94 across different studies. The CAQ has shown good test-retest reliability with correlation coefficients ranging from 0.71 to 0.87 across different studies.

The Cyberloafing Behavior Scale (CBS). for Students by Drouin, Kaiser, and Miller (2017) is designed to measure the frequency and extent to which students engage in cyberloafing behaviors, such as using electronic devices for non-class-related activities during class. The scale consists of 10 items that ask participants to rate how frequently they engage in various cyberloafing behaviors during class on a 5-point Likert scale (1 = never, 5 = always). Each item is scored on a 5-point Likert scale (1 = never, 5 = always). Scores can be summed to obtain an overall measure of cyberloafing behavior, with higher scores indicating greater levels of cyberloafing behavior. The scale has a Cronbach's alpha coefficient of .92, indicating high internal consistency and suggesting that the items are measuring the same construct of cyberloafing behavior.

Research design
In this study, we employed the relational screening model to identify the presence and/or level of change between two or more variables and to specify the relationships between the variables. We collected data using three self-report measurement tools and then used the Structural Equation Modelling (SEM) to test the model. SEM allowed them to examine the relationships between multiple variables simultaneously and determine whether the hypothesized relationships were supported by the data. This research design can be applied in various fields like education to understand complex relationships between variables.

Data analysis
In this research article, we aimed to test a model that explores the relationships between problematic internet use, cognitive absorption, and cyberloafing among adolescents. To achieve this goal, we conducted several data analysis techniques, including descriptive statistics, correlational analysis, and structural equation modeling (SEM). Firstly, we used descriptive statistics to summarize the main characteristics of the data, such as mean, standard deviation, and frequency. Secondly, we conducted a correlational analysis to examine the relationships between problematic internet use, cognitive absorption, and cyberloafing. Lastly, we used structural equation modeling to test the theoretical model proposed in this study. Structural equation modeling consisted of two main components: the measurement model and the structural model. The measurement model aimed to assess the reliability and validity of the measures used to assess the latent variables, while the structural model tested the hypothesized relationships between problematic internet use, cognitive absorption, and cyberloafing. Overall, these data analysis techniques provided a comprehensive understanding of the relationships between problematic internet use, cognitive absorption, and cyberloafing among adolescents and helped to test the theoretical model proposed in this study.

Results
Descriptive statistics and Correlations
A normality check was done the data to ensure if it is with normal distribution properties. Skewness and kurtosis were taken to identify any departures from normality and understand data characteristics. The Skewness and Kurtosis values of the PIU, CA, and Cyberloafing were within an acceptable range, respectively, -.507 and -.358, -.129 and -.590, and -.519 and -.302 as reported in Table 1. These results are consistent with prior research (Hair et al., 2010; Bryne, 2010).
The results of the correlation analyses (r) with the descriptive statistics for the variables are shown in Table 1. And Table 2.

Table 1. Descriptive statistics of PIU, CA, and Cyberloafing.

Variable	Descriptive statistics		
	Mean (SD)	Skewness	Kurtosis
PIU	35.53(6.33)	-.507	-.358
CA	32.68 (4.57)	-.129	-.590
CYB_LOF	29.13 (7.59)	-.519	-.302

Table 2. The correlation for PIU with CA, and Cyberloafing.

Correlation			
	1	2	3
PIU	-		
CA	.114**	-	
CYB_LOF	.580**	.432**	-

** p <0.01

The study found a significant positive relationship between the PIU and the CA (r = .114, p < .01) and a significant positive relationship between the PIU and the Cyberloafing (r = .580, p < .01). Additionally, a significant positive relationship was found between the CA and the Cyberloafing (r = .432, p > .01).

Structural Equation modeling
Measurement model
In the measurement model, a confirmatory measurement model was established for the variables PIU, CA, and Cyberloafing. The measurement model is a critical component of CFA because it helps to determine whether the cyberloafing and cognitive absorption (observed variables) are measuring the same underlying construct (i.e., the same latent factor) and whether the factor structure is consistent with theoretical expectations. A good fitting model is accepted if the value of the CMIN/df is <5 (Hu & Bentler, 1999; Marsh et al., 2004), the goodness of fit (GFI) indices; the Tucker and Leis index (TLI); the confirmatory fit index (CFI) is >90 (Kline, 2016; Bentler, 1990; Kline, 2016). In addition, an adequate fitting model was accepted if the AMOS computed value of the standardized root mean square residual (SRMR) <0.05 (Hu & Bentler, 1999), and the root mean

square error approximation (RMSEA) is between 0.05 and 0.08 (Kline, 2011). Table 3 shows compliance index values for the confirmatory measurement model for PIU, CA and cyerloafing.

Test Indices	Test Standard	Result
CMIN/df	<5	2.355
TLI	>0.90	0.942
CFI	>0.90	0.951
GFI	>0.90	0.922
SRMR	<0.05	0.056
RMSEA	0.05 – 0.08	0.058
p<0.001		

Table 3. Results related to the confirmatory measurement model present

According to the results, it was determined that the confirmatory measurement model can be used to test the structural model.

Structural Model
A structural equation model generated through AMOS was used to test the relationships between the variables PIU, CA, and Cyberloafing. The fit indices for the model shown in table 4 fell within the acceptable range i.e., CMIN/df = 2.355, the goodness of fit (GFI) = 0.922, TLI= 0.942, CFI= 0.951, SRMR= 0.056, RMSEA= 0.058. The squared multiple correlations were 0.57 for problematic internet use and this shows that 57% variance in problematic internet use is accounted by cognitive absorption and cyberloafing.

Table 4. Model fit indices and hypotheses results

Hypothesized relationship	Standardized estimates	t-value	p-value
CA-> PIU	-0.290	0.062	***
CYB -> PIU	-0.816	0.117	***

Model fit: CMIN/df = 2.355, the goodness of fit (GFI) = 0.922, TLI= 0.942, CFI= 0.951, SRMR= 0.056, RMSEA= 0.058.
p<0.001

The study assessed the relationship between cognitive absorption and cyberloafing on problematic internet use. There is a positive and significant relationship between cyberloafing and problematic internet use making cyberloafing predict PIU (β = 0.816; p <0.001). It was also found that there was a negative and significant relationship between cognitive absorption and problematic internet use making CA predict PIU (β = -0.290; p <0.001).
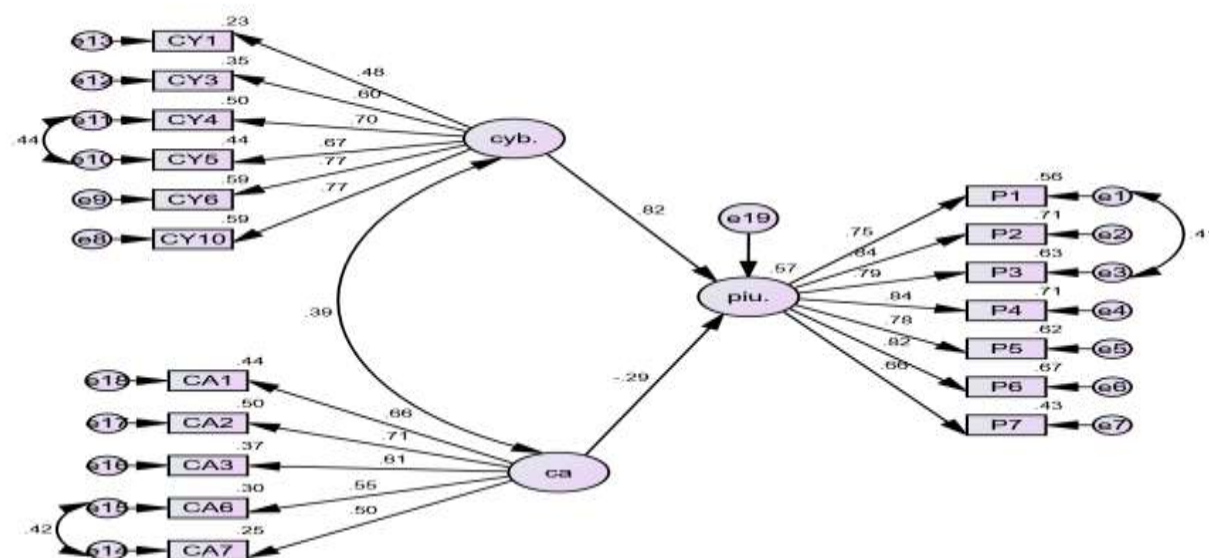

Figure 1. Structural equation modeling diagram for standardized path. Note: ca- Cognitive Absorption, piu- Problematic Internet Use, cyb- Cyberloafing.

Discussion

The study evaluated a structural model that analyses the relationships between problematic internet usage (PIU), cognitive absorption (CA), and cyberloafing. At first, we assessed the measurement models and determined that the proposed models could be used to examine the structural model. Afterwards, we conducted tests to validate the suggested structural model using measurement models that had been previously verified. The findings of the structural model demonstrated a positive and substantial association between cyberloafing and PIU, suggesting that cyberloafing was a predictor of PIU. Furthermore, the study revealed a strong and meaningful inverse relationship between CA and PIU, suggesting that CA was a reliable predictor of PIU.

Previous research has conducted other investigations that corroborate the results of the present study, which demonstrated a clear and meaningful correlation between cyberloafing and problematic internet use (PIU). Akram and Kumar (2019) did a study which revealed a favourable correlation between cyberloafing and problematic internet use (PIU) among a group of Indian university students. The study additionally discovered a positive correlation between the extent of students' involvement in cyberloafing and the likelihood of experiencing adverse outcomes related to problematic internet use (PIU), such as subpar academic achievement and social isolation. A study conducted by Akram & Rehman (2020) among university students in Pakistan also discovered a direct correlation between cyberloafing and problematic internet use (PIU). The study revealed a positive correlation between increased participation in cyberloafing activities, such as browsing social media or playing online games, and the likelihood of experiencing symptoms associated with Problematic Internet Use (PIU), such as withdrawal symptoms, tolerance, and conflicts with others. A study conducted by Akin and Iskender (2018) among Turkish university students similarly discovered a direct correlation between cyberloafing and problematic internet use (PIU). The study revealed a positive correlation between increased engagement in cyberloafing activities and the presence of symptoms associated with Problematic Internet Use (PIU), including excessive internet usage and a lack of self-control over internet usage.

Multiple studies have been carried out to examine the correlation between cyberloafing and problematic internet use (PIU) among university and college students in India. In their research, Ghosh and Mondal (2020) investigated the phenomenon of cyberloafing and its correlation with internet addiction in Indian adolescents. The study revealed a positive correlation between cyberloafing behaviours, such as engaging in social media surfing and playing online games, and internet addiction among the subjects.

In their study, Gupta and Singh (2018) examined the correlation between cyberloafing and internet addiction among employed individuals in India. The study revealed a substantial correlation between cyberloafing and internet addiction, indicating that cyberloafing could potentially serve as a predictor of internet addiction among Indian professionals. Bhatia and Srivastava (2021) conducted a study that examined the relationship between cyberloafing and internet addiction among college students in India. The study revealed a positive correlation between cyberloafing and internet addiction among the participants. It also indicated that cyberloafing could result in adverse academic consequences, such as subpar grades and diminished academic motivation. There is a positive correlation between the level of engagement in cyberloafing activities, such as browsing social media or playing online games, and the likelihood of experiencing symptoms of Problematic Internet Use (PIU), such as excessive internet use, withdrawal symptoms, tolerance, and conflicts with others. This relationship has been supported by studies conducted by Błachnio & Przepiorka (2016), Eren & Yılmaz (2018), and Widyanto & McMurran (2004). Research has demonstrated that engaging in cyberloafing and experiencing problematic internet usage (PIU) can have detrimental impacts on teenagers, including academic procrastination, diminished academic achievement, heightened levels of sadness and anxiety, and sleep disturbances. Adolescents who participate in cyberloafing are at a higher risk of experiencing problematic internet use (PIU), which can lead to negative consequences (Yen et al., 2007; Tsai et al., 2016; Lam & Peng, 2010; Jang & Ryu, 2015).

The study's findings indicated a strong and statistically significant inverse relationship between CA and PIU, suggesting that CA was a predictor of PIU. The pertinent literature encompasses studies that have reached conclusions comparable to ours. Gao et al. (2018) examined the correlation between compulsive attachment (CA) and problematic internet use (PIU) among Chinese college students. The researchers discovered a strong and statistically significant negative correlation between CA and PIU. Additionally, they observed that CA was a predictor of PIU. More precisely, pupils who had greater levels of cognitive ability were less prone to have problematic internet use. The authors propose that cultivating a robust state of cognitive concentration in activities not using the internet could potentially serve as a safeguard against excessive internet usage. In addition, Lin et al. (2018) did a study involving high school students from Taiwan and discovered a negative correlation between CA and PIU. They also observed that this association was somewhat influenced by psychological well-being. The authors propose that advocating for cognitive autonomy and fostering psychological well-being could serve as effective approaches to avoid or mitigate problematic internet use (PIU) among teenagers. In their study, Joo and Lee (2018) examined the correlation between cyber aggression (CA), social media usage, and problematic internet use (PIU) among Korean teenagers. The researchers discovered a negative correlation between CA and PIU, and determined that this association was partially influenced by a decrease in social media usage. The authors propose that encouraging activities that promote

deep mental engagement and limiting excessive use of social media may be helpful strategies for preventing problematic internet usage (PIU) among adolescents.

Kaur and Kaur (2020) did a study in India that investigated the correlation between compulsive internet use (CA), problematic internet use (PIU), and academic achievement in Indian adolescents. The researchers discovered a negative correlation between CA and PIU, with the strength of this negative association being more pronounced in males compared to females. In addition, they discovered a favourable correlation between CA and academic success. The authors propose that therapies targeting the enhancement of cognitive abilities may assist in mitigating problematic internet use (PIU) and enhancing academic achievement in adolescents. Studies more frequently indicate a positive correlation between cognitive absorption (CA) and problematic internet usage (PIU) in individuals, rather than a negative correlation. Studies have demonstrated that excessive cognitive immersion can have detrimental effects on internet usage among adolescents. Adolescents who are deeply engaged in their online activities are more prone to encountering issues such as internet addiction, social isolation, and academic underachievement (Bhardwaj & Gupta, 2017; Elphinston & Noller, 2011; Jelenchick, 2013; Lin & Chang, 2014). However, research has discovered a correlation between cognitive absorption (CA) and problematic internet use (PIU), indicating that being fully engaged in a particular activity or task can act as a safeguard against excessive internet usage. There are several possible explanations for why CA and PIU may have a negative correlation. Flow refers to a mental state of intense engagement in an activity or endeavour, marked by a feeling of control and concentrated concentration. Individuals with elevated levels of CA may have a greater propensity to experience flow, a state characterised by deep engagement and satisfaction, which in turn diminishes the inclination to participate in alternative online activities. Furthermore, persons who exhibit a high level of absorption in a particular activity are more likely to possess intrinsic motivation to participate in that activity. Consequently, they are less inclined to pursue alternative internet hobbies that may offer immediate gratification but lack long-term fulfilment. Ultimately, those who are deeply engrossed in an activity may possess enhanced abilities to control their actions and resist the allure of other internet hobbies that offer more immediate gratification.

Overall, our data indicate that both cyberloafing and compulsive internet use (CA) may have significant consequences for the emergence of problematic internet use (PIU). Engaging in cyberloafing can heighten the chances of experiencing problematic internet use (PIU). However, advocating for computer-assisted (CA) activities may serve as a feasible approach to decrease the probability of developing PIU.

Implications for Practice

The study's findings have many significances for researchers and practitioners who are concerned with problematic internet usage (PIU) and associated matters. The study's findings indicate that engaging in cyberloafing activities may increase the likelihood of experiencing problematic internet use (PIU) among adolescents. This emphasises the significance of recognising and resolving cyberloafing behaviours in treatments aimed at preventing or treating Problematic Internet Use (PIU). The study's findings indicate that engaging in other activities that require cognitive absorption may help protect against problematic internet use (PIU). This emphasises the possible advantages of encouraging engagement in alternative activities (such as sports, arts, or hobbies) as a tactic to decrease the probability of developing problematic internet use. Practitioners may seek to create therapies that specifically address these variables, such as enhancing awareness on the adverse effects of excessive internet use and advocating for mindfulness and self-regulation techniques. Moreover, these discoveries could contribute to the creation of educational initiatives focused on enhancing adolescent digital literacy and advocating for responsible internet usage. Researchers can expand on these findings by conducting additional research on the correlation between cognitive absorption, cyberloafing, and problematic internet use in other demographics. They can also investigate potential factors that may influence or moderate this association. In summary, this study emphasises the need of comprehending the intricate dynamics of internet usage among adolescents and the necessity for focused interventions and educational initiatives to encourage positive internet behaviours. It is important to acknowledge the limitations of the study, such as its correlational design, the reliance on self-report measures to evaluate cyberloafing, cognitive absorption, and PIU, and the restricted sample size of Indian adolescents. Although the study offers valuable insights into the connections among cyberloafing, cognitive absorption, and problematic internet use (PIU), additional research is necessary to investigate these relationships in various populations and settings. Furthermore, it is important to overcome the limitations of this study by employing more diverse samples, longitudinal designs, and objective measures of internet usage.

Reference

1. American Psychological Association. (2021). Understanding internet addiction. https://www.apa.org/topics /internet-gaming-disorder.
2. Weinstein, A., & Lejoyeux, M. (2015). New developments on the neurobiological and pharmaco-genetic mechanisms underlying internet and videogame addiction. The American Journal on Addictions, 24(2), 117-125. https://doi.org/10.1111/ajad.12110

3.   Kuss, D. J., & Griffiths, M. D. (2017). Social networking sites and addiction: Ten lessons learned. International Journal of Environmental Research and Public Health, 14(3), 311. doi: 10.3390/ijerph14030311

4.   Li, W., O'Brien, J. E., Snyder, S. M., & Howard, M. O. (2015). Characteristics of internet addiction/pathological internet use in U.S. university students: A qualitative-method investigation. PloS one, 10(2), e0117372. doi: 10.1371/journal.pone.0117372

5.   Meerkerk, G. J., Van Den Eijnden, R. J., Vermulst, A. A., & Garretsen, H. F. (2009). The compulsive internet use scale (CIUS): Some psychometric properties. CyberPsychology & Behavior, 12(1), 1-6. doi: 10.1089/cpb.2008.0181.

6.   Agarwal, R., & Karahanna, E. (2000). Time flies when you're having fun: Cognitive absorption and beliefs about information technology usage. MIS Quarterly, 24(4), 665-694. https://doi.org/10.2307/3250981.

7.   Anand, N., Jetten, J., Pozzoli, T., Jaspal, R., & Badruddin, N. (2018). Problematic internet use and loneliness among adolescents: A study from Pakistan. Journal of Psychosocial Research, 13(2), 299-311.

8.   Chaudhari, B., Menon, P., Saldanha, D., Tewari, A., & Bhattacharya, L. (2015). Internet addiction and its determinants among Indian adolescents. Indian Journal of Community Medicine, 40(2), 115-121. https://doi.org/10.4103/0970-0218.153874

9.   Goel, D., Subramanyam, A., & Kamath, R. (2013). A study on the prevalence of internet addiction and its association with psychopathology in Indian adolescents. Indian Journal of Psychiatry, 55(2), 140-143. https://doi.org/10.4103/0019-5545.111451

10. Gupta, S., & Bashir, L. (2018). Social media addiction among adolescents: Role of cognitive absorption, study engagement and peer influence. International Journal of Indian Psychology, 6(1), 54-69. https://doi.org/10.25215/0601.083

11. Jena, R. K. (2015). Modeling the determinants of behavioral intentions for mobile learning acceptance among the students of India. Social Science Research Network. https://doi.org/10.2139/ssrn.2617203

12. Krishnan, J., Rajiah, K., & Sarbadhikari, S. N. (2016). Cyberloafing and its impact on classroom engagement among the Indian students. Journal of Cases in Information Technology, 18(1), 1-18. https://doi.org/10.4018/JCIT.2016010101

13. Lim, V. K., & Teo, T. S. (2005). Prevalence, perceived seriousness, justification and regulation of cyberloafing in Singapore: An exploratory study. Information & Management, 42(8), 1081-1093. https://doi.org/10.1016/j.im.2004.12.002

14. Sarkar, S., Chakraborty, S., & Tannir, C. (2017). Integrating cognitive absorption and cognitive engagement for understanding students' classroom engagement in higher education. Journal of Information Technology Theory and Application, 18(1), 5-27.

15. Saraswat, A., & Gupta, S. (2020). Cognitive absorption and academic engagement among Indian adolescents: Role of self-efficacy and internet utility. Indian Journal of Positive Psychology, 11(4), 343-349.

16. Sharma, A., & Sharma, R. (2018). Internet self-efficacy, perceived utility and cyber loafing among Indian youth. International Journal of Cyber Behavior, Psychology and Learning, 8(2), 1-16. https://doi.org/10.4018/IJCBPL.2018040101

17. Singh, S., & Tuteja, A. (2019). Cognitive absorption, cyberloafing, and problematic internet use among Indian adolescents: A moderated mediation model. Journal of Psychosocial Research, 14(1), 93-107.

18. Vitak, J., Crouse, J., & LaRose, R. (2011). Personal internet use at work: Understanding cyberloafing. Computers in Human Behavior, 27(5), 1751-1759. https://doi.org/10.1016/

19. Caplan, S. E. (2002). Problematic Internet use and psychosocial well-being: Development of a theory-based cognitive–behavioral measurement instrument. Computers in Human Behavior, 18(5), 553-575. https://doi.org/10.1016/S0747-5632(02)00004-3

20. Agarwal, R., & Karahanna, E. (2000). Time flies when you're having fun: Cognitive absorption and beliefs about information technology usage. MIS Quarterly, 24(4), 665-694. https://doi.org/10.2307/3250981.

21. Drouin, M., Kaiser, D. H., & Miller, D. A. (2017). Measurement and validity characteristics of the Cyberloafing Behavior Scale (CLS) for college students. Journal of Education and Practice, 8(10), 44-54.

22. Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Structural Equation Modeling: A Multidisciplinary Journal, 6(1), 1-55.

23. Marsh, H. W., Hau, K. T., & Wen, Z. (2004). In search of golden rules: Comment on hypothesis-testing approaches to setting cutoff values for fit indexes and dangers in overgeneralizing Hu and Bentler's (1999) findings. Structural Equation Modeling: A Multidisciplinary Journal, 11(3), 320-341.

24. Kline, R. B. (2016). Principles and practice of structural equation modeling. Guilford publications.

25. Bentler, P. M. (1990). Comparative fit indexes in structural models. Psychological Bulletin, 107(2), 238-246.

26. Kline, R. B. (2016). Principles and practice of structural equation modeling. Guilford publications.

27. Akram, U., & Kumar, D. (2019). Cyberloafing and problematic internet use among university students: The mediating role of internet addiction. Journal of Educational Computing Research, 57(3), 583-600.

28. Akram, U., & Rehman, U. (2020). Cyberloafing and problematic internet use among university students: A cross-sectional study from Pakistan. Journal of Educational Computing Research, 58(1), 138-157.

29. Akin, A., & Iskender, M. (2018). Cyberloafing and its relations with students' academic performance, academic procrastination, and psychological well-being. Journal of Educational Computing Research, 56(7), 1086-1108.
30. Ghosh, A., & Mondal, T. (2020). A study on cyberloafing and its relationship with internet addiction among Indian adolescents. International Journal of Indian Psychology, 8(4), 1722-1733.
31. Gupta, A., & Singh, P. (2018). Cyberloafing and internet addiction: Analysis of a developing country context. Behaviour & Information Technology, 37(6), 601-615.
32. Bhatia, N., & Srivastava, S. (2021). Cyberloafing and its impact on internet addiction among Indian college students. Journal of Advances in Social Science and Humanities, 7(5), 196-203. summarize these studies.
33. Błachnio, A., & Przepiorka, A. (2016). Internet use, Facebook intrusion, and depression: Results of a cross-sectional study. European Psychiatry, 33, S681-S682. https://doi.org/10.1016/j.eurpsy.2016.01.1157
34. Eren, B., & Yılmaz, K. (2018). Cyberloafing behaviors and problematic internet use among university students. The Journal of Faculty of Educational Sciences, 51(1), 267-280. https://doi.org/10.17244/eku.374481
35. Widyanto, L., & McMurran, M. (2004). The psychometric properties of the internet addiction test. CyberPsychology & Behavior, 7(4), 443-450. https://doi.org/10.1089/cpb.2004.7.443
36. Gao, T., Li, J., Zhang, H., Liang, Y., & Chen, Y. (2018). Relationship between cognitive absorption and problematic internet use: A test of a mediation model. Addictive Behaviors, 82, 125-130. https://doi.org/10.1016/j.addbeh.2018.02.017
37. Lin, Y. H., Tsai, C. C., Liang, L. R., Lin, S. S., & Chen, Y. F. (2018). Cognitive absorption, psychological well-being, and problematic internet use: Test of a mediation model. Journal of Educational Computing Research, 56(2), 255-275. https://doi.org/10.1177/0735633117712647
38. Joo, Y. J., & Lee, E. K. (2018). The effects of cognitive absorption on social media use and problematic social media use: Evidence from Korean adolescents. Children and Youth Services Review, 88, 11-17. https://doi.org/10.1016/j.childyouth.2018.02.033
39. Kaur, P., & Kaur, S. (2020). Cognitive absorption and problematic internet use among adolescents: Moderating effect of gender and its relationship with academic performance. Journal of Educational Computing Research, 58(2), 529-550. https://doi.org/10.1177/0735633119863354
40. Bhardwaj, V., & Gupta, P. (2017). Relationship between cognitive absorption and internet addiction among adolescents. International Journal of Indian Psychology, 4(3), 18-28.
41. Elphinston, R. A., & Noller, P. (2011). Time to face it! Facebook intrusion and the implications for romantic jealousy and relationship satisfaction. Cyberpsychology, Behavior, and Social Networking, 14(11), 631-635.
42. Jelenchick, L. A., Eickhoff, J. C., & Moreno, M. A. (2013). "Facebook depression?" social networking site use and depression in older adolescents. Journal of Adolescent Health, 52(1), 128-130.
43. Lin, C. Y., & Chang, Y. P. (2014). Determinants of Internet Addiction among Adolescents: A Path Model Based on Mobile Internet. Journal of Health Psychology, 19(12), 1475-1484.