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Antecedents and Consequences of Cyberloafing Behaviour among College Students: A Gender Based Multi-Group Analysis Using TPB-SCT Approach

Vineesh A K^{1*}, Rajesh K², Baby Sandhya K³

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ABSTRACT

This study investigated the antecedents and consequences of cyberloafing intentions among arts and science college students. Using an integrated framework of the theory of planned behaviour (TPB) and social cognitive theory (SCT), the study analysed students' cyberloafing behaviours and academic implications. Additionally, gender-based multi-group analysis was performed. A quantitative cross-sectional methodology was employed, with data collected using a survey questionnaire administered to 571 college students using a multistage proportionate stratified sampling technique. The data were analysed using the Smart PLS SEM approach. Cyberloafing attitude, academic self-efficacy, subjective norms, and excessive social media usage positively influence students' intentions to engage in cyberloafing. However, academic stress did not impact cyberloafing intentions. Additionally, a gender-based analysis revealed no significant differences in how cyberloafing intention dimensions affect academic consequences. This study revealed that students' cyberloafing significantly influences their academic performance and burnout levels. Therefore, educational institutions should evaluate students' academic and non-academic Internet activities. These findings offer insights to scholars, higher education institutions, and policymakers.

INTRODUCTION

The widespread availability of digital devices and technological advancements in communication have led to increased personal use of the Internet for non-academic purposes in educational environments. Scholars have conceptualised this as 'cyberloafing' (Lim, 2002) or 'cyberslacking' (Garrett & Danziger, 2008b). Cyberloafing is defined as the deliberate use of Internet access by employees or students during work or class hours to visit websites unrelated to their professional or academic responsibilities for personal purposes (Lim, 2002; O'Neill *et al.*, 2014). People often use cyberloafing for entertainment, communication, and information purposes (Santepeci & Sert, 2021). Cyberloafing behaviours among students include activities such as Internet surfing, social media usage, online gaming, movie watching, online shopping, and gambling (Metin-Orta & Demirtepe-Saygılı, 2023).

Existing research on students' cyberloafing tendencies has predominantly concentrated on the antecedents and consequences of cyberloafing behaviours in the workplace (Askew *et al.*, 2014; Venkatesh *et al.*, 2023), the dimensions of cyberloafing behaviours in educational environments (Kutluay & Karaca, 2025; Nguyen *et al.*, 2025; Rana *et al.*, 2019), and social media-based learning behaviours (Krishna & Agrawal, 2023). However, scholarly opinions regarding the prevalence of cyberloafing behaviours among higher education students remain inconsistent (Durak, 2000; Guo *et al.*, 2025; Metin-Orta & Demirtepe-Saygılı, 2023; Mihelic *et al.*, 2023; Simon *et al.*, 2024). For instance, Guo *et al.* (2025) argued that moderate engagement in cyberloafing

can potentially improve academic outcomes, whereas excessive involvement in such activities tends to correlate with poor academic results. Therefore, it is important to consider the antecedents and consequences of cyberloafing behaviours in the higher education context. Numerous theoretical frameworks have been proposed to examine cyberloafing behaviours in various contexts, including the theory of planned behaviour (TPB) (Askew *et al.*, 2014; Nguyen *et al.*, 2025), technology acceptance model (TAM) (Venkatesh *et al.*, 2023), cognitive load theory (CLT) (Guo *et al.*, 2025), social cognitive theory (SCT) (Wang *et al.*, 2025), and the unified theory of acceptance and use of technology (UTAUT) (Nguyen *et al.*, 2025). Among these, TPB remains the predominant framework for predicting cyberloafing behaviours across diverse settings (Askew *et al.*, 2014; Rana *et al.*, 2019). To develop a more parsimonious model to elucidate students' intentions to engage in cyberloafing and its academic consequences, this study proposes an integrative approach that incorporates the perspectives of the theory of planned behaviour (TPB) (Ajzen, 1991) and social cognitive theory (SCT) (Bandura, 2001), considering the diverse dimensions of cyberloafing and its effects on both academic achievement and burnout.

Furthermore, despite the existing body of research, the antecedents and consequences of cyberloafing in academic environments have not been sufficiently examined (Whelan *et al.*, 2022; Xu *et al.*, 2022). In this context, the current study proposes a research model by investigating the relationships between various dimensions of cyberloafing behaviour and its impact on academic performance among college students.

¹ Associate Professor, Department of commerce, CKGM Govt.college Perambra, Kozhikode,Kerala, India

² Assistant Professor, Department of Commerce, Govt college Mokeri, Kozhikode, India

³ Assistant Professor, Department of Commerce, CKGM Govt college Perambra, Kozhikode, India

* Corresponding author's e-mail: vincechckd81@gmail.com

LITERATURE REVIEW

Theoretical underpinning

TPB and Cyberloafing intention

The theory of planned behaviour (TPB) posits that behaviour is predicted by an individual's intention to perform an action (Ajzen, 1991). An individual's intention to engage in a particular behaviour is influenced by their attitude, subjective norms, and perceived behavioural control. The TPB has been utilised to evaluate perceptions, motivational factors, and behavioural intentions through its constructs in various learning contexts, including cyberloafing (Askew *et al.*, 2014; Karabiyik *et al.*, 2021; Rana *et al.*, 2019).

SCT and Cyberloafing intention

SCT offers a comprehensive framework for integrating various cognitive and behavioural factors to explain individuals' self-regulated behaviour (Bandura, 2001; Liu *et al.*, 2020; Metin-Orta & Demirtepe-Saygılı, 2023). This study views cyberloafing as a form of non-academic Internet use among young people and explores the cognitive-behavioural aspects of students' technology usage. Existing research has demonstrated that SCT is effective in elucidating students cyberloafing behaviour (Guo *et al.*, 2025; Simon *et al.*, 2024; Zhang *et al.*, 2022). The present study employed academic stress (Chen *et al.*, 2021) and excessive social media usage (Durak, 2020) as cognitive variables to predict students' intentions to engage in cyberloafing within an academic context.

Attitude and Cyberloafing intention

Attitude toward cyberslacking pertains to the degree to which an individual evaluates cyberslacking as favourable or unfavourable (Venkatesh *et al.*, 2023). In their research involving undergraduate and postgraduate students, Rana *et al.* (2019) found that a lack of interest in course content, distraction by peers, and insufficient focus were indicators of individuals' attitudes and intentions to engage in cyberloafing. Thus, students with a more positive view of cyberslacking are likely to participate. Existing literature (Hanif *et al.*, 2022; Nguyen *et al.*, 2025; Venkatesh *et al.*, 2023) empirically demonstrates that attitude significantly influences the intention to engage in cyberloafing. Based on the above arguments, we propose the following hypothesis:

H1: Attitude positively influences cyberloafing intention

Self-efficacy and Cyberloafing intention

Self-efficacy refers to the level of confidence required to perform a particular task (Ajzen, 1991). Within the framework of the TPB, self-efficacy is intricately linked to perceived behavioural control in the context of cyberloafing, particularly when individuals navigate preferred websites (Askew *et al.*, 2014). In addition, Rana *et al.* (2019) found a positive association between perceived behavioural control and cyberslacking intention among higher education students. Studies (Askew *et al.*, 2014; Gokcearslan *et al.*, 2016; Mihelic *et al.*, 2023) have found

that students' self-efficacy in accessing online facilities or resources can significantly predict the intention to engage in cyberloafing. Therefore, this study proposes the following hypothesis:

H2: Self-efficacy positively influences cyberloafing intention

Subjective norms and Cyberloafing intention

Venkatesh *et al.* (2023) demonstrated that subjective norms significantly influence cyberslacking behaviour among employees. Norms can be categorised into prescriptive norms, which delineate acceptable behaviours, and descriptive norms, which reflect the actual behaviours exhibited by reference groups (Askew *et al.*, 2014). Peer groups play a crucial role as reference points for young individuals, leading students to be influenced by their peers to engage in excessive online activities during academic hours (Zhou *et al.*, 2019). Research indicates that subjective norms are instrumental in shaping students' intentions and behaviours related to cyberloafing in an academic environment (Karabiyik *et al.*, 2021; Nguyen *et al.*, 2025; Rana *et al.*, 2019). Therefore, this study proposes the following hypothesis:

H3: Subjective norms positively influence cyberloafing intention

Academic stress and Cyberloafing intention

Students often experience academic stress, which includes their perceptions and expectations of their academic capabilities and workloads (Bedewy & Gabriel, 2015). This stress frequently results in students participating in non-academic activities, such as browsing the Internet and using social media (Gokcearslan *et al.*, 2018). According to Chen *et al.* (2021), perceived stress is a significant predictor of cyberloafing behaviour among college students. Moreover, Nweke *et al.* (2024) found a significant link between academic stress and cyberloafing, with fatigue partially mediating this connection and self-control influencing the extent of the effect. Research has shown that students who perceive their stress levels as high are prone to experiencing distress and often resort to cyberloafing as a means of alleviating their emotions and stress (Asghar & Tariq, 2025; Nweke *et al.*, 2024; Simatupang & Margaretha, 2023). Based on the above arguments, the following hypothesis is proposed:

H4: Academic stress positively influences cyberloafing intention

Excessive usage of social media and Cyberloafing intention

Online learning activities, discussions, chatting, instant messaging, and the monitoring of class members across various online learning platforms, including social media, can influence students' cyberloafing behaviours (Durak, 2020; Durak & Saritepeci, 2019). Moreover, the length of time that a student utilises social media-based learning has an impact on cyberloafing behaviour (Lau, 2017). Fu *et al.* (2021) argued that using social media in the classroom can divert students' attention from their current tasks, resulting in multitasking. In addition, students are prone to using social media to watch movies, learn music, and play video games instead of searching for learning material

and preparing presentations and assignments (Metin-Orta & Demirtepe-Saygılı, 2023). In contrast, Krishna *et al.* (2023) found no significant impact of social media usage on cyberloafing behaviour. Empirical evidence suggests that students' engagement with social media during class sessions may result in cyberloafing, which affects their academic outcomes (Durak, 2020; Krishna & Agrawal, 2023). Based on the above discussion, excessive social media usage is prone to cyberloafing among higher education students. Therefore, we propose the following hypothesis:

H5: Excessive usage of social media positively influences cyberloafing intention

Cyberloafing intention and academic success

According to Durak and Saritepeci (2019), engaging in cyberloafing can have beneficial effects, such as alleviating stress, providing relaxation during work hours, and facilitating the completion of numerous work-related tasks. Cyberloafing activities during class intervals can provide relaxation and alleviate boredom, thereby improving academic performance through self-regulated learning (Metin-Orta & Dilek Demirtepe-Saygılı, 2023). The literature provides evidence regarding the beneficial impact of cyberloafing behaviours on academic performance, indicating that it serves as a strategy for coping with academic distractions (Andel *et al.*, 2019; Pindek *et al.*, 2018). Therefore, we propose the following hypothesis:

H6: Cyberloafing intention positively influences students' academic success

Cyberloafing intention and academic burnout

According to Wu *et al.* (2018), cyberloafing activities, both within and outside the classroom, affect students' academic distraction and burnout. Zhang and Yang (2025) found a notable association between participation in cyberloafing on social media platforms and elevated levels of online academic burnout. Gokçearslan *et al.* (2018) argued that engaging in cyberloafing among students results in academic burnout and, reduced motivation, and disciplinary issues. Furthermore, Tandon *et al.* (2021) noted that cyberloafing can manifest as an isolating activity or a form of procrastination during lectures. Therefore, engaging in cyberloafing compels students to juggle multiple tasks simultaneously, diminishing their overall performance in the academic environment (Durak, 2020). This study proposes the following hypothesis:

H7: Cyberloafing intention positively influences students' academic burnout

Excessive usage of social media and academic burnout

According to Whelan *et al.* (2022), excessive dependence on social networking platforms among academics may lead to heightened stress levels, diminished self-regulation, and a decline in academic performance. Xu *et al.* (2022) examined the complex dimensions of social

media overload and revealed that it adversely affected the academic performance of college students. In addition, uninterrupted engagement with social media can disrupt students' focus during academic work, potentially harming their academic performance (Masrom *et al.*, 2024). Previous research (Baert *et al.*, 2020; Kutluay & Karaca, 2025; Whelan *et al.*, 2022; Zimmer, 2022) has demonstrated a significant correlation between excessive social media use and academic impairment among higher education students. Based on the above discussion, this study proposes the following hypothesis:

H8: Excessive usage of social media positively influences academic burnout

Gender differences

Baturay and Toker (2015) found that male students demonstrated a greater propensity for cyberloafing than their female peers in educational environments. Similarly, Metin-Orta and Demirutku (2022) found that male students exhibited a higher hedonistic stimulation orientation and engaged in cyberloafing behaviours more frequently than female students in higher education contexts. Lamash *et al.* (2024) identified gender-based differences in interactions with specific cyberloafing activities, such as playing online games, sharing stories, and using social media during academic sessions. Empirical studies (Lamash *et al.*, 2024; Ma *et al.*, 2024; Zhang *et al.*, 2024) have consistently demonstrated that male students are more inclined to participate in unproductive cyberloafing activities than their female counterparts.

This suggests a greater tendency toward non-academic use of the Internet and social media during academic sessions. Furthermore, no prior study has specifically examined group-wise differences in the antecedents and consequences of cyberloafing from an integrated perspective. Therefore, this study investigates gender-based differences in various dimensions of cyberloafing intentions and their consequences among arts and science college students. Based on the above discussion, the following hypotheses are proposed:

H9a: Gender moderates the relationship between cyberloafing attitude and cyberloafing intention

H9b: Gender moderates the relationship between academic self-efficacy and cyberloafing intention

H9c: Gender moderates the relationship between subjective norms and cyberloafing intention

H9d: Gender moderates the relationship between academic stress and cyberloafing intention

H9e: Gender moderates the relationship between excessive social media usage and cyberloafing intention

H9f: Gender moderates the relationship between cyberloafing intention and students' academic success

H9g: Gender moderates the relationship between cyberloafing intention and students' academic burnout

H9h: Gender moderates the relationship between excessive use of social media and academic burnout

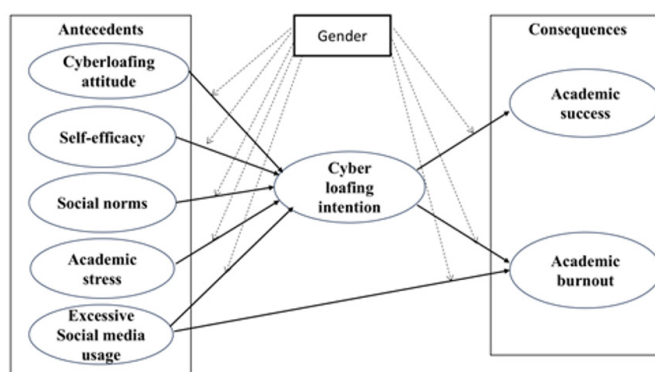


Figure 1: Conceptual model proposed for the study

MATERIALS AND METHODS

Research design

This study followed a quantitative deductive cross-sectional design and employed a multistage proportionate stratified sampling strategy to investigate the antecedents and consequences of cyberloafing intention among arts and science college students.

Instrument measurement

Attitudes toward cyberloafing were assessed using four items from Askew *et al.* (2014), while academic self-efficacy related to cyberloafing was measured using five items based on Askew *et al.* (2014) and Venkatesh *et al.* (2023). Four items were adapted from Venkatesh *et al.* (2023) to measure subjective norms. Four indicators were adapted from Bedewy and Gabriel (2015) to measure academic stress. Excessive social media use was measured using five indicators adapted from Liu *et al.* (2018). Five indicators were adapted from Akbulut *et al.* (2016) to measure cyberloafing intentions.

The construct of academic success was measured using five indicators from Whelan *et al.* (2020). Academic burnout was measured using six items from the adapted version of the Maslach Burnout Inventory (MBI) for students by Schaufeli *et al.* (2002). All constructs were measured reflectively using a five-point Likert scale ranging from 1 ('strongly disagree') to 5 ('strongly agree'). A total of 38 items were adapted and used to finalise the survey instrument.

Participants and procedures

The participants in this study were higher education students because they were highly engaged with digital technology and had consistent Internet access. Data were gathered from students at various arts and science colleges in North Kerala. Multistage proportionate stratified sampling was used to collect data from students enrolled in undergraduate and postgraduate programs. North Kerala comprises five revenue districts, and the University of Calicut is the most prominent institution in this region. Its academic jurisdiction extends to two additional districts, resulting in the inclusion of seven districts in this study. This ensures broader coverage of institutions in this geographical region. There were 43 government, 62 aided, and 204 self-financing colleges (www.highereducation.kerala.gov.in) in North

Kerala. Given the substantial number of self-financing colleges, this category was selected proportionately. Thus, 26 colleges were randomly selected from each district. Data were collected across different academic streams—arts, science, and commerce—with the expectation of obtaining 30 responses from each institution. Consequently, 780 questionnaires were distributed both online and offline.

The survey instrument was finalised through a pilot study, following the recommendations of Teare *et al.* (2014). To ensure content validity, the opinions of three academic experts from relevant fields were sought. The decision to focus on students in their second semester and beyond was made because the academic achievements of first-semester students had not yet been established, making it essential for them to complete at least one semester. Initial permission was sought from the heads of the respective educational institutions, and the instrument was operationalised with the support of class tutors. A minimum sample size of 98 was estimated using G* Power software version 3.1.7.9 (Faul *et al.*, 2007) with a statistical power of 0.80 and a confidence level of 0.05. To ascertain group-specific heterogeneity within the population, at least twice the calculated sample size was used. A total of 613 responses were initially obtained, and after discarding incomplete and missing items, 571 responses were used for analysis. Data were collected from August to September 2025.

RESULTS AND DISCUSSION

Demographic profile

The study involved 571 valid participants, including 241 males (42.20%) and 330 females (57.80 %) students. As shown in Table 1, a substantial proportion (50.79 %) of these students were enrolled in self-financed programs. Approximately 27% of the institutions attended by these students were categorised as aided, with the remainder being government-run institutions. Among the participants, the majority of 389 students (68.12%) were undergraduate (UG) students, while the rest were pursuing postgraduate (PG) programs. Of the total student respondents, 37.65% were from the arts discipline and 33.98% were from the commerce field. Notably, approximately 90% of the respondents reported using the Internet for over three hours daily. Furthermore, 272 students (47.64%) used the Internet for non-academic purposes daily.

Table 1: Demographic Profile of respondents (N=571)

	Frequency	Percentage
Gender		
Male	241	42.20
Female	330	57.80
Category		
Government	128	22.41
Aided	153	26.80
Self-financing	290	50.79
Academic Level		
UG	389	68.12
PG	182	31.88
Course stream		
Arts	215	37.65
Science	162	28.37
Commerce	194	33.98
Frequency of internet use		
Less than 2 hours	58	10.15
3- 4hrs	201	35.20
Above 4 hrs	312	54.64
Hours spent daily on non-academic use		
Less than 1 hour	118	20.67
1-2 hrs	181	31.69
Above 3 hrs	272	47.64

Common method bias

Social science research often encounters common method biases, primarily because of its reliance on a single data source and the collection of data at a singular point in time. Harman's single-factor test was employed to address common method bias following the procedures recommended by Podsakoff *et al.* (2003). To mitigate substantial issues related to common method bias, it is imperative that a single factor explains less than 50% of the total variance. The results demonstrated that the total variance accounted for by a single factor was 37.46%; therefore, common method bias was not a serious issue in the dataset.

Measurement model analysis

The evaluation of the measurement model involved assessing the reliability and validity of the constructs and their measures (Hair *et al.*, 2021). Construct reliability was

determined using item loading values, and Cronbach's alpha values and composite reliability scores were analysed to confirm internal consistency reliability (Hair *et al.*, 2022). Average variance extracted (AVE) values were calculated to establish convergent validity (Hair *et al.*, 2021). Additionally, the heterotrait-monotrait ratio of correlations (HTMT) was examined to assess discriminant validity (Henseler *et al.*, 2015). The results (as shown in Table 2) confirm that the reliability and convergent validity of the constructs and their measures (outer loadings > 0.70, CR > 0.70, and AVE > 0.50) meet the criteria suggested by Hair *et al.* (2022). Although the outer loading values of the two items in academic burnout were less than 0.7, they qualified the AVE values and were thus deemed satisfactory. Furthermore, the HTMT values (as shown in table 3) were less than 0.85, as suggested by Henseler *et al.* (2015). Therefore, the model satisfied the reliability and validity tests.

Table 2: Measurement Model

Components	Items	Loadings	Composite Reliability	AVE	Cronbach's alpha
Cyberloafing attitude	ATT1	0.847	0.897	0.686	0.847
	ATT2	0.804			
	ATT3	0.833			
	ATT4	0.827			

Academic self-efficacy	ASE1	0.803	0.892	0.623	0.848
	ASE2	0.778			
	ASE3	0.780			
	ASE4	0.806			
	ASE5	0.779			
Subjective norms	SN1	0.839	0.873	0.632	0.807
	SN2	0.774			
	SN3	0.762			
	SN4	0.803			
Academic stress	AST1	0.776	0.900	0.694	0.852
	AST2	0.820			
	AST3	0.867			
	AST4	0.866			
Excessive social media usage	ESM1	0.777	0.896	0.634	0.855
	ESM2	0.807			
	ESM3	0.791			
	ESM4	0.811			
	ESM5	0.793			
Cyberloafing intention	CINT1	0.828	0.912	0.675	0.879
	CINT2	0.789			
	CINT3	0.826			
	CINT4	0.825			
	CINT5	0.838			
Academic success	AS1	0.703	0.880	0.595	0.831
	AS2	0.737			
	AS3	0.809			
	AS4	0.811			
	AS5	0.792			
Academic burnout	ABO1	0.592	0.859	0.506	0.804
	ABO2	0.732			
	ABO3	0.688			
	ABO4	0.757			
	ABO5	0.724			
	ABO6	0.764			

Table: 3: Measurement Model: HTMT ratio

	ATT	ASE	SN	AST	ESM	CINT	AS	ABO
ATT	--							
ASE	0.455	--						
SN	0.492	0.482	--					
AST	0.465	0.448	0.604	--				
ESM	0.718	0.602	0.538	0.510	--			
CINT	0.626	0.670	0.540	0.472	0.839	--		
AS	0.600	0.566	0.479	0.566	0.563	0.559	--	
ABO	0.545	0.570	0.788	0.573	0.577	0.585	0.494	--

Structural model assessment

The assessment of causal relationships between constructs is susceptible to multicollinearity. To ensure the accuracy of the study results, this study addresses multicollinearity issues by employing variance inflation factors (VIFs), as recommended by Kock (2017). The results demonstrate that all VIF values were below 3.3, indicating that the data were free from multicollinearity issues (Hair *et al.*, 2017). The hypothesised relationships between constructs were assessed using PLS SEM with a bootstrapping procedure of 10000 subsamples, as suggested by Hair *et al.* (2022). PLS-SEM is suitable for examining complex models from a multidimensional perspective for non-normal data (Rehman *et al.*, 2023). The results of the path analysis are presented in Table 4.

The findings indicated that all direct hypotheses, except H4, were supported. Cyberloafing attitude ($\beta = 0.103$, $p < 0.05$), academic self-efficacy ($\beta = 0.241$, $p < 0.01$), subjective norms ($\beta = 0.090$, $p < 0.05$), and excessive social media use ($\beta = 0.498$, $p < 0.01$) had significant positive effects on cyberloafing intentions, thereby validating H1, H2, H3, and H5. Conversely, the effect of academic stress on cyberloafing intention ($\beta = 0.014$, $p > 0.05$) was not statistically significant and was thus rejected. Furthermore, the impact of cyberloafing intention on academic success ($\beta = 0.492$, $p < 0.01$) and burnout ($\beta = 0.312$, $p < 0.01$) was also found to be significant, supporting H6 and H7. The relationship between excessive social media usage and academic burnout ($\beta = 0.262$, $p < 0.01$) was also significant, confirming H8.

Table 4: Path co-efficient estimates

Paths	Original sample	T statistics	LLCI	ULCI	P values	Decision
ATT -> CLI	0.103	2.823	0.033	0.175	0.005	Supported
ASE -> CLI	0.241	6.020	0.166	0.322	0.000	Supported
SN -> CLI	0.090	2.467	0.019	0.162	0.014	Supported
AST -> CLI	0.014	0.499	-0.049	0.075	0.653	Not supported
ESM -> CLI	0.498	10.793	0.409	0.590	0.000	Supported
CLI -> AS	0.492	14.252	0.420	0.556	0.000	Supported
CLI -> ABO	0.312	5.202	0.193	0.427	0.000	Supported
ESM -> ABO	0.262	4.348	0.137	0.375	0.000	Supported

The PLS predict procedure was used to evaluate the predictive relevance of the model, following the recommendations of Shmueli *et al.* (2019). In this context, Q2 Predict, root mean squared error (RMSE), and mean absolute error (MAE) values were calculated. The findings (as shown in Table 5) revealed that the Q2

Predict values for all items of the endogenous constructs were positive, and the RMSE values for these items in the PLS structural equation model (SEM) were lower than those in the linear model, indicating the above-moderate predictive power of the model.

Table 5: PLS predict assessment of endogenous constructs

Constructs	Items	Q2 Predict	RMSE _{PLS-SEM}	RMSE _{LM}	RMSE _{LM-PLS SEM}	Decision
Cyberloafing intention	CINT1	0.449	0.951	0.949	0.002	above moderate predictive power
	CINT2	0.335	1.060	1.036	0.024	
	CINT3	0.406	0.895	0.915	0.020	
	CINT4	0.404	0.946	0.969	0.023	
	CINT5	0.409	0.969	0.975	0.006	
Academic success	AS1	0.143	1.118	1.015	0.103	
	AS2	0.144	1.001	1.039	0.038	
	AS3	0.192	0.999	1.043	0.044	
	AS4	0.191	1.033	0.962	0.071	
	AS5	0.187	1.097	1.021	0.076	
Academic burnout	ABO1	0.181	1.191	0.960	0.231	
	ABO2	0.096	1.291	1.181	0.331	
	ABO3	0.160	1.020	1.092	0.072	
	ABO4	0.154	1.012	1.167	0.155	
	ABO5	0.095	1.204	1.223	0.019	
	ABO6	0.153	1.172	1.070	0.102	

Additionally, the R^2 value (from Table 6) for cyberloafing intention was 0.607, signifying that 60.7 percent of the variance in cyberloafing intention was accounted for by cyberloafing attitude, academic self-efficacy, subjective norms, academic stress, and excessive social media use.

Table 6: Co-efficient of Determination

Paths	R^2	Adjusted R^2
Cyberloafing intention	0.607	0.603
Academic success	0.242	0.241
Academic burnout	0.285	0.283

Multi-Group Moderating Effect

A permutation-based multigroup analysis was conducted to ascertain the heterogeneity within the study. The moderating effect of gender on the relationships between the constructs was evaluated using the Measurement Invariance of Composite Models (MICOM) procedure (Henseler *et al.*, 2016). The MICOM procedure comprises configural invariance, compositional invariance, and the assessment of equality in composite means and variances (Cheah *et al.*, 2020; Henseler *et al.*, 2016; Rasoolimanesh *et al.*, 2021). The results (Table 7) of the MICOM analysis confirmed full measurement invariance for all constructs, thereby enabling gender-based multi-group analysis. The findings (from Table 8) indicated no gender-based differences in the relationships between the various dimensions of students' cyberloafing intentions, academic success, and academic burnout. Consequently, H9a, H9b, H9c, H9d, H9e, H9f, H9g, and H9h were not supported.

Discussion

The widespread adoption of mobile devices and advancements in digital technology in the education sector have facilitated the expression of distinctive personality traits and learning styles among higher education students. This has led to an inevitable role for entertainment in and between academics. The current study employed a deductive quantitative approach to investigate the antecedents and consequences of cyberloafing behaviour among arts and science college students in Kerala using an integrated theoretical framework of the TPB and SCT. This research examined cyberloafing attitudes, academic self-efficacy, subjective norms, academic stress, and excessive social media usage as antecedents of cyberloafing intention, whereas academic success and academic burnout were identified as consequences. A research model was proposed and validated by collecting responses from 571 college students using partial least squares structural equation modelling (PLS-SEM). The findings of this study indicate a positive correlation between attitudes toward cyberloafing and the intention to engage in such behaviour. This implies that college students who perceive the use of the Internet for non-academic purposes during class sessions are more inclined to participate in cyberloafing activities. These results align

Furthermore, the R^2 values for academic success and academic burnout were 0.242 and 0.285, respectively. Consequently, the model demonstrated robust explanatory power, as suggested by Hair *et al.* (2017).

with the findings of (Nguyen *et al.*, 2025; Rana *et al.*, 2019), who observed that students with a preference for browsing the internet for non-academic purposes during study sessions are more likely to engage in cyberloafing. The study also found that self-efficacy positively influences on cyberloafing intention, which is in line with the findings of (Askew *et al.* (2014), Durak (2000), Mercado *et al.* (2017), and Nguyen *et al.* (2025). This indicates that belief in one's ability to access the Internet heightened the likelihood of engaging in cyberloafing, as students perceived their preferred sites to be blocked. In contrast, Gokcearslan *et al.* (2016) found an insignificant association between self-efficacy and cyberloafing behaviour among university students. Our study reinforces the idea that subjective norms are instrumental in shaping the intention to become cyber loaf, as they encapsulate the influence that society, peer groups, friends, family, and relatives exert on students' cyberloafing activities. These findings are in line with those of previous studies (Askew *et al.*, 2014; Karabiyik *et al.*, 2021). However, Mihelic *et al.* (2023) found inconsistent results, indicating that subjective norms negatively influence students' cyberloafing behaviour in classrooms.

In contrast to earlier studies (Asghar & Tariq, 2025; Askew *et al.*, 2014; Karabiyik *et al.*, 2021), the link between academic stress and cyberloaf intention was not statistically significant. This finding aligns with Zhou *et al.*'s (2021) research, who suggested that the variable nature of daily stress and weekly academic pressures on college students can negatively predict cyberloafing at the individual level. The findings further indicated a strong positive association between excessive engagement in social media and students cyberloafing behaviours. These findings are corroborated by the results of Whelan *et al.* (2022), Xu *et al.* (2021), and Zimmer (2022), who posited that college students are prone to engaging in cyberloafing activities during regular academic hours. This tendency is attributed to their flexible academic schedules, abundant leisure time, and occasionally limited self-discipline, particularly when they experience boredom during academic sessions.

Excessive social media use is significantly correlated with academic burnout, as evidenced by the findings of Baert *et al.* (2020), Sunday *et al.* (2021), Whelan *et al.* (2022), and

Table 7: Results of Invariance measurement using MICOM analysis

Constructs	Compositional invariance		Partial measurement invariance established	Equal mean assessment			Equal variance assessment			Full Measurement invariance established
	Configural invariance	C=1		Differences	Confidence interval	Equal	Differences	Confidence interval	Equal	
ATT	Yes	0.999	(0.998/1.000)	Yes		Yes	0.194	(-0.197 /0.196)	Yes	Yes
ASE	Yes	0.999	(0.998/1.000)	Yes		Yes	0.063	(-0.179 /0.181)	Yes	Yes
SN	Yes	0.998	(0.995/1.000)	Yes		Yes	-0.069	(-0.171 /0.158)	Yes	Yes
AST	Yes	1.000	(0.997/1.000)	Yes		Yes	0.113	(-0.176 /0.163)	Yes	Yes
ESM	Yes	1.000	(0.999/1.000)	Yes		Yes	0.007	(-0.209 /0.207)	Yes	Yes
CLI	Yes	1.000	(0.999/1.000)	Yes		Yes	0.081	(-0.191/0.187)	Yes	Yes
AS	Yes	0.999	(0.996/1.000)	Yes		Yes	0.019	(-0.201 /0.193)	Yes	Yes
ABO	Yes	0.999	(0.994/1.000)	Yes		Yes	0.113	(-0.219/0.215)	Yes	Yes

Table 8: Results of multi-group analysis

Path coefficients				Confidence interval	P value	Results
Relationship	Men	Women	Difference			
ATT -> CLI	0.151	0.062	0.089	(-0.148 /0.135)	0.221	Not supported
ASE -> CLI	0.230	0.247	-0.017	(-0.153 /0.166)	0.816	Not supported
SN -> CLI	0.093	0.089	0.004	(-0.136 /0.142)	0.963	Not supported
AST -> CLI	0.024	0.005	0.019	(-0.132 /0.127)	0.775	Not supported
ESM -> CLI	0.470	0.525	-0.055	(-0.181 /0.171)	0.594	Not supported
CLI -> AS	0.512	0.482	0.031	(-0.134 /0.148)	0.633	Not supported
CLI -> ABO	0.328	0.293	0.035	(-0.231/0.228)	0.773	Not supported
ESM -> ABO	0.273	0.263	0.010	(-0.256 /0.232)	0.935	Not supported

Yang *et al.* (2021). This correlation suggests that students may divert their attention from academic responsibilities to engage in social media activities such as cultivating social relationships, sharing content (text, audio, video), instant messaging, and listening to music. Moreover, the unrestricted use of social media and smartphones by students may result in concentration difficulties, academic distractions, procrastination of academic tasks, and a reduction in the time allocated to learning activities, potentially exerting a detrimental impact on their academic performance. The intention to engage in cyberloafing was strongly and significantly correlated with students' academic burnout. This finding aligns with those of previous studies by Demirtepe-Saygılı and Metin-Orta (2021), Gökçearslan *et al.* (2018), and Krishna *et al.* (2023), which indicated that students often neglect their academic responsibilities in favour of participating in cyberloafing activities.

Contrary to expectations, the study findings indicated a strong positive correlation between cyberloafing intentions and college students' academic success. These findings align with those of (Chang *et al.* (2019), Durak (2000), Guo *et al.* (2025), Metin-Orta and Demirtepe-Saygılı (2023), and Wu *et al.* (2018), who noted that students tend to engage in cyberloafing behaviours when they perceived that their expectations were fulfilled in terms of learning outcomes, particularly in out-of-class educational settings. Furthermore, engaging in cyberloafing activities may promote students' cognitive capacities, which can rejuvenate their energy levels, thereby enhancing their academic performance. Furthermore, the findings from the gender-based multi-group analysis (MGA) indicated that there were no significant gender differences across the various dimensions of cyberloafing concerning students' intentions to engage in cyberloafing, their academic success, and academic burnout.

Implications

Theoretical implications

This research expands the theoretical understanding of how cyberloafing behaviour among arts and science college

students affects their academic performance using TPB and SCT frameworks. Existing research on cyberloafing has predominantly focused on the behavioural aspects of students in academic settings (Durak, 2000; Guo *et al.*, 2025; Mihelic *et al.*, 2023). However, there is a paucity of studies examining the academic outcomes associated with this phenomenon. The outcomes of this study adequately fill this research gap. Moreover, the integration of these two theories explicitly links cyberloafing intention, students' cognitive behaviours using digital technology, and academic outcomes, thereby offering a theoretical foundation for comprehending this intricate relationship. Furthermore, both academic stress and excessive social media use have been identified as the most significant predictors of cyberloafing intentions in academic and learning contexts (Chen *et al.*, 2021; Fu *et al.*, 2020). This study provides a nuanced understanding of their impact on students' intentions to engage in cyberloafing and its learning consequences.

Practical implications

This study results have several practical implications. The research model intends to provide useful insights to educational institutions, academics, and institutional authorities regarding the positive and negative uses of cyberloafing. This research also highlights how students perceive their opinions on various dimensions of cyberloafing and its academic consequences. The results indicate that excessive cyberloafing has both positive and negative consequences; therefore, a strong academic monitoring system at the institutional level is required. Moreover, prompt warnings should be provided to students who frequently engage in cyberloafing. The study findings focused on the importance of implementing specific academic and educational initiatives to encourage healthier technology use and study habits among college students. Additionally, tutoring and mentoring services are essential to offer guidance to students and parents on responsible cyberloafing and effective time management. An effective strategy to mitigate cyberloafing involves educating students

about classroom ethics and the adverse consequences of cyberloafing, thereby influencing their attitudes toward this behaviour. If students' perceptions of cyberloafing are altered, they may voluntarily abstain from engaging in it during class. Furthermore, a well-structured lecture incorporating interactive teaching techniques can ensure active student engagement, thereby reducing the propensity for cyberloafing. Overall, the results of this study provide valuable insights for higher education institutions and authorities to accurately assess the optimal level of cyberloafing to achieve academic success and mitigate academic burnout.

Limitations and scope for future research

In this research, we explored the antecedents and consequences of cyber loafing behaviour among higher education students in Kerala. For this, an integrated SCT-TPB approach was employed. The study findings demonstrated that usage of technology in learning environment of higher education have both positive and negative consequences. The study findings suggest that proper measures from institutional framework could promote positive usage of technology so as to grab potential benefits in learning settings. Also, this study was conducted exclusively among arts and science college students. Consequently, future research should encompass a broader range of disciplines, including technical, management, and medical fields, as well as other professional college students. This expansion may be beneficial for future studies. This study is limited to a local context; therefore, to generalise the findings, it is recommended that the study be replicated in diverse socio-cultural contexts. Furthermore, to address the limitations inherent in cross-sectional studies, data should be collected at multiple time points in the future. Future research could also examine the extent of cyberloafing and its effects on academic outcomes, both within and outside the classroom.

Declaration of Conflicting Interests

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Data availability statement

The original contributions presented in the study are included in the article and data will be available based on request.

CONCLUSION

This study examined the antecedents and consequences of cyber loafing behaviour among students in higher education settings in Kerala. The outcomes of this research suggest that cyberloafing attitude, academic self-efficacy, subjective norms, and excessive social media usage are the critical determinants to predict cyberloafing intention among college students. In contrast, the impact of academic stress on cyberloafing intention is

inconsistent. Moreover, students did not express gender-wise differences in how various drivers of cyber loafing intention impacted academic consequences. This would help academicians, higher-education institutions, policy makers, parents and various stakeholders to incorporate a comprehensive policy framework on the positive and negative uses of cyberloafing in academic context. In summary, strict regulatory compliances on the use and misuse of technology in the learning environment is still required.

REFERENCES

- Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes*, 50(2), 179-211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Akbulut, Y., Dursun, Ö. Ö., Dönmez, O., & Şahin, Y. L. (2016). In search of a measure to investigate cyberloafing in educational settings. *Computers in Human Behavior*, 55, 616-625. <https://doi.org/10.1016/j.chb.2015.11.002>
- Andel, S. A., Kessler, S. R., Pindek, S., Kleinman, G., & Spector, P. E. (2019). Is cyberloafing more complex than we originally thought? Cyberloafing as a coping response to workplace aggression exposure. *Computers in Human Behavior*, 101, 124-130. <https://doi.org/10.1016/j.chb.2019.07.013>
- Asghar, A., & Tariq, O. (2025). Perceived Academic Stress, Cyberloafing and Academic Procrastination in University Students. *Online Media and Society*, 6(3), 49-61. <https://doi.org/10.71016/oms/wybv909>
- Askew, K., Buckner, J. E., Taing, M. U., Ilie, A., Bauer, J. A., & Coover, M. D. (2014). Explaining cyberloafing: The role of the theory of planned behavior. *Computers in Human Behavior*, 36, 510-519. <https://doi.org/10.1016/j.chb.2014.04.006>
- Baert, S., Vujić, S., Amez, S., Claeskens, M., Daman, T., Maeckelberghe, A., ... & De Marez, L. (2020). Smartphone use and academic performance: correlation or causal relationship?. *Kyklos*, 73(1), 22-46. <https://doi.org/10.1111/kykl.12214>
- Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual review of psychology*, 52(1), 1-26. <https://doi.org/10.1146/annurev.psych.52.1.1>
- Baturay, M. H., & Toker, S. (2015). An investigation of the impact of demographics on cyberloafing from an educational setting angle. *Computers in Human Behavior*, 50, 358-366. <https://doi.org/10.1016/j.chb.2015.03.081>
- Bedewy, D., & Gabriel, A. (2015). Examining perceptions of academic stress and its sources among university students: The Perception of Academic Stress Scale. *Health psychology open*, 2(2), 2055102915596714. <https://doi.org/10.1177/2055102915596714>
- Chang, C. T., Tu, C. S., & Hajiyev, J. (2019). Integrating academic type of social media activity with perceived academic performance: A role of task-related and non-task-related compulsive Internet use. *Computers &*

- Education*, 139, 157-172. <https://doi.org/10.1016/j.compedu.2019.05.011>
- Cheah, J. H., Thurasamy, R., Memon, M. A., Chuah, F., & Ting, H. (2020). Multigroup analysis using SmartPLS: Step-by-step guidelines for business research. *Asian Journal of Business Research*, 10(3), I-XIX. <https://doi.org/10.14707/ajbr.200087>
- Chen, Y., Chen, H., Andrasik, F., & Gu, C. (2021). Perceived stress and cyberloafing among college students: The mediating roles of fatigue and negative coping styles. *Sustainability*, 13(8), 4468. <https://doi.org/10.3390/su13084468>
- Demirtepe-Saygılı, D., & Metin-Orta, I. (2021). An investigation of cyberloafing in relation to coping styles and psychological symptoms in an educational setting. *Psychological reports*, 124(4), 1559-1587. <https://doi.org/10.1177/0033294120950299>
- Durak, H. Y. (2020). Cyberloafing in learning environments where online social networking sites are used as learning tools: Antecedents and consequences. *Journal of Educational Computing Research*, 58(3), 539-569. <https://doi.org/10.1177/0735633119867766>
- Durak, H. Y., & Saritepeci, M. (2019). Occupational burnout and cyberloafing among teachers: Analysis of personality traits, individual and occupational status variables as predictors. *The Social Science Journal*, 56(1), 69-87. <https://doi.org/10.1016/j.soscj.2018.10.011>
- Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G* Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior research methods*, 39(2), 175-191. <https://doi.org/10.3758/BF03193146>
- Fu, E., Gao, Q., Wei, C., Chen, Q., & Liu, Y. (2021). Understanding student simultaneous smartphone use in learning settings: A conceptual framework. *Journal of Computer Assisted Learning*, 37(1), 91-108. <https://doi.org/10.1111/jcal.12471>
- Garrett, R. K., & Danziger, J. N. (2008). Disaffection or expected outcomes: Understanding personal Internet use during work. *Journal of Computer-Mediated Communication*, 13(4), 937-958. <https://doi.org/10.1111/j.1083-6101.2008.00425.x>
- Gökçearslan, Ş., Mumcu, F. K., Haşlamam, T., & Çevik, Y. D. (2016). Modelling smartphone addiction: The role of smartphone usage, self-regulation, general self-efficacy and cyberloafing in university students. *Computers in Human Behavior*, 63, 639-649. <https://doi.org/10.1016/j.chb.2016.05.091>
- Gökçearslan, Ş., Uluyol, Ç., & Şahin, S. (2018). Smartphone addiction, cyberloafing, stress and social support among university students: A path analysis. *Children and Youth Services Review*, 91, 47-54. <https://doi.org/10.1016/j.childyouth.2018.05.036>
- Government of Kerala, Higher Education Department. (2022). www.highereducation.kerala.gov.in
- Guo, Y., Song, Y., & Guo, J. (2025). The curvilinear relationship between cyberloafing and academic performance among college students: empirical evidence from China. *Education and Information Technologies*, 1-20. <https://doi.org/10.1007/s10639-025-13499-4>
- Hair, J., & Alamer, A. (2022). Partial Least Squares Structural Equation Modeling (PLS-SEM) in second language and education research: Guidelines using an applied example. *Research Methods in Applied Linguistics*, 1(3), 100027. <https://doi.org/10.1016/j.rmal.2022.100027>
- Hair, J. F., Astrachan, C. B., Moisesescu, O. I., Radomir, L., Sarstedt, M., Vaithilingam, S., & Ringle, C. M. (2021). Executing and interpreting applications of PLS-SEM: Updates for family business researchers. *Journal of Family Business Strategy*, 12(3), 100392. <https://doi.org/10.1016/j.jfbs.2020.100392>
- Hair Jr, J. F., Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: updated guidelines on which method to use. *International Journal of Multivariate Data Analysis*, 1(2), 107-123. <https://doi.org/10.1504/IJMDA.2017.087624>
- Hanif, M. S., Abdul Hamid, A. B., Khurshid, A., & Butt, M. F. T. (2022). What leads to cyberslacking intentions among students in Pakistan: An enhanced theory of planned behavior perspective. *The Electronic Journal of Information Systems in Developing Countries*, 88(6), e12224. <https://doi.org/10.1002/isd2.12224>
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the academy of marketing science*, 43(1), 115-135. <https://doi.org/10.1007/s11747-014-0403-8>
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2016). Testing measurement invariance of composites using partial least squares. *International marketing review*, 33(3), 405-431. <https://doi.org/10.1108/IMR-09-2014-0304>
- Karabıyık, C., Baturay, M. H., & Özdemir, M. (2021). Intention as a mediator between attitudes, subjective norms, and cyberloafing among preservice teachers of English. *Participatory Educational Research*, 8(2), 57-73. <https://doi.org/10.17275/per.21.29.8.2>
- Kock, N. (2017). Common method bias: a full collinearity assessment method for PLS-SEM. In *Partial least squares path modeling: Basic concepts, methodological issues and applications* (pp. 245-257). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-64069-3_11
- Krishna, S. M., & Agrawal, S. (2023). Cyberloafing: Exploring the role of psychological wellbeing and social media learning. *Behavioral Sciences*, 13(8), 649. <https://doi.org/10.3390/bs13080649>
- Kutluay, E., & Karaca, F. (2025). A model proposal explaining the influence of smartphone addiction related factors on high school students' academic success. *Education and Information Technologies*, 30(3), 4061-4098. <https://doi.org/10.1007/s10639-024-12947-x>
- Lamash, L., Fogel, Y., & Hen-Herbst, L. (2024). Adolescents' social interaction skills on social media

- versus in person and the correlations to well-being. *Journal of Adolescence*, 96(3), 501-511. <https://doi.org/10.1002/jad.12244>
- Lau, W. W. (2017). Effects of social media usage and social media multitasking on the academic performance of university students. *Computers in human behavior*, 68, 286-291. <https://doi.org/10.1016/j.chb.2016.11.043>
- Lim, V. K. (2002). The IT way of loafing on the job: Cyberloafing, neutralizing and organizational justice. *Journal of organizational behavior: the international journal of industrial, occupational and Organizational Psychology and Behavior*, 23(5), 675-694. <https://doi.org/10.1002/job.161>
- Liu, F., Lim, E. T., Li, H., Tan, C. W., & Cyr, D. (2020). Disentangling utilitarian and hedonic consumption behavior in online shopping: An expectation disconfirmation perspective. *Information & Management*, 57(3), 103199. <https://doi.org/10.1016/j.im.2019.103199>
- Lizarte Simón, E. J., Khaled Gijón, M., Galván Malagón, M. C., & Gijón Puerta, J. (2024). Challenge-obstacle stressors and cyberloafing among higher vocational education students: The moderating role of smartphone addiction and Maladaptive. *Frontiers in Psychology*, 15, 1358634. <https://doi.org/10.3389/fpsyg.2024.1358634>
- Ma, L., Zhang, X., & Yu, P. (2024). Enterprise social media usage and social cyberloafing: an empirical investigation using the JD-R model. *Internet Research*, 34(3), 939-959. <https://doi.org/10.1108/INTR-04-2021-0239>
- Masrom, M., Busalim, A., Griffiths, M. D., Asadi, S., & Mohd Ali, R. (2024). The impact of excessive Instagram use on students' academic study: a two-stage SEM and artificial neural network approach. *Interactive Learning Environments*, 32(7), 3546-3565. <https://doi.org/10.1080/10494820.2023.2184393>
- Mercado, B. K., Giordano, C., & Dilchert, S. (2017). A meta-analytic investigation of cyberloafing. *Career Development International*, 22(5), 546-564. <https://doi.org/10.1108/CDI-08-2017-0142>
- Metin-Orta, I., & Demirtepe-Saygılı, D. (2023). Cyberloafing behaviors among university students: Their relationships with positive and negative affect. *Current Psychology*, 42(13), 11101-11114. <https://doi.org/10.1007/s12144-021-02374-3>
- Metin-Orta, I., & Demirutku, K. (2022). Cyberloafing behaviors among university students and its relation to Hedonistic-Stimulation value orientation, cyberloafing attitudes, and time spent on the Internet. *Current Psychology*, 41(7), 4271-4282. <https://doi.org/10.1007/s12144-020-00932-9>
- Mihelič, K. K., Lim, V. K. G., & Culiberg, B. (2023). Cyberloafing among Gen Z students: the role of norms, moral disengagement, multitasking self-efficacy, and psychological outcomes. *European Journal of Psychology of Education*, 38(2), 567-585. <https://doi.org/10.1007/s10212-022-00617-w>
- Nguyen, N. T., Rehman, S. U., Elrehail, H., Baber, H., & Shamout, M. D. (2025). Misuse of technology: Factors influencing cyberloafing behavior. *Computers in Human Behavior Reports*, 18, 100669. <https://doi.org/10.1016/j.chbr.2025.100669>
- Nweke, Gabriel E., Yosra Jarrar, and Ibrahim Horoub. (2024) "Academic stress and cyberloafing among university students: The mediating role of fatigue and self-control." *Humanities and Social Sciences Communications*, 11(1), 1-8. <https://doi.org/10.1057/s41599-024-02930-9>
- O'Neill, T. A., Hambley, L. A., & Chatellier, G. S. (2014). Cyberslacking, engagement, and personality in distributed work environments. *Computers in Human Behavior*, 40, 152-160. <https://doi.org/10.1016/j.chb.2014.08.005>
- Pindek, S., Krajcevská, A., & Spector, P. E. (2018). Cyberloafing as a coping mechanism: Dealing with workplace boredom. *Computers in Human Behavior*, 86, 147-152. <https://doi.org/10.1016/j.chb.2018.04.040>
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of applied psychology*, 88(5), 879.
- Rana, N. P., Slade, E., Kitching, S., & Dwivedi, Y. K. (2019). The IT way of loafing in class: Extending the theory of planned behavior (TPB) to understand students' cyberslacking intentions. *Computers in Human Behavior*, 101, 114-123. <https://doi.org/10.1016/j.chb.2019.07.022>
- Rasoolimanesh, S. M., Ringle, C. M., Sarstedt, M., & Olya, H. (2021). The combined use of symmetric and asymmetric approaches: Partial least squares-structural equation modeling and fuzzy-set qualitative comparative analysis. *International Journal of Contemporary Hospitality Management*, 33(5), 1571-1592. <https://doi.org/10.1108/IJCHM-10-2020-1164>
- Rehman, S. U., Elrehail, H., Poulin, M., Shamout, M. D., & Alzoubi, H. M. (2023). Green managerial practices and green performance: a serial mediation model. *International Journal of Innovation Studies*, 7(3), 196-207. <https://doi.org/10.1016/j.ijis.2022.12.004>
- Santepeci, M., & Sert, U. (2021). Cyberloafing level of university students: A scale development study. *Research on Education and Psychology*, 5(1), 41-52.
- Schaufeli, W. B., Martinez, I. M., Pinto, A. M., Salanova, M., & Bakker, A. B. (2002). Burnout and engagement in university students: A cross-national study. *Journal of cross-cultural psychology*, 33(5), 464-481. <https://doi.org/10.1177/0022022102033005003>
- Simatupang, K. M., & Margaretha, M. (2023). The Impact of Academic Stress on Cyberloafing with Fatigue as a Mediating Variable: A Study of Students in Bandung City-Indonesia During a Pandemic. *European Journal of Educational Research*, 12(1). <https://doi.org/10.12973/eu-jer.12.1.525>
- Simón, E. J. L., Khaled Gijón, M., Galván Malagón, M.

- C., & Gijón Puerta, J. (2024). Challenge-obstacle stressors and cyberloafing among higher vocational education students: The moderating role of smartphone addiction and Maladaptive. *Frontiers in Psychology*, 15, 1358634. <https://doi.org/10.3389/fpsyg.2024.1358634>
- Shmueli, G., Sarstedt, M., Hair, J. F., Cheah, J. H., Ting, H., Vaithilingam, S., & Ringle, C. M. (2019). Predictive model assessment in PLS-SEM: guidelines for using PLSpredict. *European journal of marketing*, 53(11), 2322-2347.
- Sunday, O. J., Adesope, O. O., & Maarhuis, P. L. (2021). The effects of smartphone addiction on learning: A meta-analysis. *Computers in Human Behavior Reports*, 4, 100114. <https://doi.org/10.1016/j.chbr.2021.100114>
- Tandon, A., Kaur, P., Ruparel, N., Islam, J. U., & Dhir, A. (2022). Cyberloafing and cyberslacking in the workplace: systematic literature review of past achievements and future promises. *Internet Research*, 32(1), 55-89. <https://doi.org/10.1108/INTR-06-2020-0332>
- Teare, M. D., Dimairo, M., Shephard, N., Hayman, A., Whitehead, A., & Walters, S. J. (2014). Sample size requirements to estimate key design parameters from external pilot randomised controlled trials: a simulation study. *Trials*, 15(1), 264. <https://doi.org/10.1186/1745-6215-15-264>
- Venkatesh, V., Cheung, C. M., Davis, F. D., & Lee, Z. W. (2023). Cyberslacking in the workplace: Antecedents and effects on job performance. *MIS Quarterly*, 47(1), 281-316. <https://doi.org/10.25300/MISQ/2022/14985>
- Wang, M., Liu, Y., & Lang, Y. (2025). Does perceived overqualification lead to cyberloafing? A moderated-mediation model based on social cognitive theory. *Chinese Management Studies*, 19(2), 549-566. <https://doi.org/10.1108/CMS-12-2023-0690>
- Whelan, E., Islam, A. N., & Brooks, S. (2020). Applying the SOBC paradigm to explain how social media overload affects academic performance. *Computers & Education*, 143, 103692. <https://doi.org/10.1016/j.compedu.2019.103692>
- Whelan, E., Golden, W., & Tarafdar, M. (2022). How technostress and self-control of social networking sites affect academic achievement and wellbeing. *Internet Research*, 32(7), 280-306. <https://doi.org/10.1108/INTR-06-2021-0394>
- Wu, J., Mei, W., & Ugrin, J. C. (2018). Student cyberloafing in and out of the classroom in China and the relationship with student performance. *Cyberpsychology, Behavior, and Social Networking*, 21(3), 199-204. <https://doi.org/10.1089/cyber.2017.0397>
- Xu, Y., Li, Y., Zhang, Q., Yue, X., & Ye, Y. (2022). Effect of social media overload on college students' academic performance under the COVID-19 quarantine. *Frontiers in psychology*, 13, 890317. <https://doi.org/10.3389/fpsyg.2022.890317>
- Yang, Z., Asbury, K., & Griffiths, M. D. (2021). "A cancer in the minds of youth?" A qualitative study of problematic smartphone use among undergraduate students. *International Journal of Mental Health and Addiction*, 19(4), 934-946. <https://doi.org/10.1007/s11469-019-00204-z>
- Zhang, Y., Tian, Y., Yao, L., Duan, C., Sun, X., & Niu, G. (2022). Teaching presence predicts cyberloafing during online learning: From the perspective of the community of inquiry framework and social learning theory. *British Journal of Educational Psychology*, 92(4), 1651-1666. <https://doi.org/10.1111/bjep.12531>
- Zhang, M., Yang, X., & Akintunde, T. Y. (2024). Sex gaps and age differences in the structure of academic cyberloafing from early to middle adolescence: A network analysis. *Journal of Adolescence*, 96(6), 1339-1353. <https://doi.org/10.1002/jad.12352>
- Zhou, B., Li, Y., Tang, Y., & Cao, W. (2021). An experience-sampling study on academic stressors and cyberloafing in college students: The moderating role of trait self-control. *Frontiers in Psychology*, 12, 514252. <https://doi.org/10.3389/fpsyg.2021.514252>
- Zimmer, J. C. (2022). Problematic social network use: Its antecedents and impact upon classroom performance. *Computers & Education*, 177, 104368. <https://doi.org/10.1016/j.compedu.2021.104368>