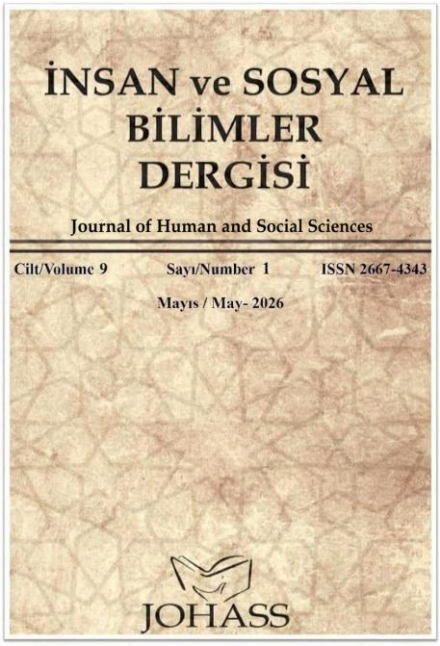
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Cyberloafing in Education: A Systematic Review

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Abstract

This systematic review synthesizes empirical research on cyberloafing in educational contexts by nalyzing 33 Web of Science–indexed studies. Guided by PRISMA procedures and the DISCAR framework, the review analyzes methodological trends, theoretical orientations, and key findings. The review's primary contribution lies in its comprehensive integration of the DISCAR framework to map the multi-dimensional nature of cyberloafing, providing a clearer taxonomy of its antecedents and consequences than previously available. The findings demonstrate a strong predominance of quantitative research designs and survey-based data collection, with university students constituting the most frequently studied population. Theoretical frameworks are largely grounded in self-regulation, procrastination, and motivation theories. The analysis shows that cyberloafing stems from intersecting individual, pedagogical, and technological factors. Key antecedents include poor time management, low motivation, and monotonous instructional practices, while consequences range from diminished academic performance to increased cognitive load. To address these issues, the studies recommend pedagogical redesigns coupled with self-regulation training. Finally, the review identifies critical gaps, such as the underuse of qualitative methods and limited focus on younger learners. The study provides a comprehensive synthesis of the current knowledge base and identifies avenues for future research to deepen theoretical and empirical understanding of cyberloafing in education.

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Introduction

The rapid and pervasive integration of digital technologies into educational environments has transformed students' learning processes while simultaneously increasing behaviors that interfere with academic engagement. One such behavior—cyberloafing—is defined as students' use of digital devices for non-academic purposes such as social media, online messaging, entertainment, or similar activities during academic tasks (Demirtepe-Saygılı & Metin-Orta, 2020; Wu et al., 2018). Originally conceptualized in workplace settings, cyberloafing recentlybecome a central focus within educational research due to the expansion of online and hybrid learning models (Allen, et. al,., 2015; Durak, 2020).

A growing body of literature demonstrates that cyberloafing related with affects learning in multidimensional ways. Off-task digital behaviors during instruction disrupt attention, increase cognitive load, and impair learning outcomes (Fisher et al., 2014; Li, 2002; Surbakti et al., 2024; Xu et al., 2023). These findings highlight that cyberloafing is not simply a behavioral deviation but a pedagogical risk that interferes with core cognitive processes, including self-regulation, congnitive control and motivation (Chen, at al., 2021; Kay et al., 2017; Masruroh et al., 2024; Wang, 2022), cognitive control (; Zhang et al., 2015), procrastination (Y. Chen et al., 2021), and motivation (Varol & Yıldırım, 2018) creates a complex tapestry that defines how cyberloafing impacts academic performance.

In educational contexts, cyberloafing refers specifically to students' tendencies to use the internet for off-task purposes during instructional time (W. Chen & Looi, 2007; Dunmade & Adewojo, 2023; Holstein & Gubrium, 2002; Rana et al., 2019; Wang, 2022). Research has shown that the routine presence of digital devices amplifies distractions, complicating classroom management strategies (Nkrumah et al., 2021; Öztürk & Kerse, 2022; Zincir et al., 2023). The issue is particularly visible in Türkiye, especially within higher education institutions where students have frequent, unrestricted access to smartphones. Over the past decade, cyberloafing has become increasingly common in higher education globally, emerging as a significant research domain within the educational technology literature (Doğru & Kabasakal, 2023; Gülnar, 2020). The rise of cyberloafing behaviors among students reveals a complex interplay of structural influences related to device access (Arokiasamy, 2017; Demirtepe-Saygılı & Metin-Orta, 2020), online learning trends (Dinmore, 2019; Mulholland & Bates, 2014), and instructional design (Martin et al., 2025; Naura et al., 2025; Nkrumah et al., 2021; Ravizza et al., 2016).

The literature also discusses various strategies to prevent cyberloafing. For example, effective use of technological tools (Pelikan et al., 2021; Shroff et al., 2007; Yağmur, 2022) or well-structured online courses that actively engage students can mitigate the risks of cyberloafing (Yağmur, 2022). Shroff et al. (Shroff et al., 2007) suggests robust instructional strategies to overcome students' divert attention to non-academic pursuits. Well-designed interventions supported by technology is another option for to deal with preventing cyberloafing (Koyanagi et al., 2021).

The academic literature identifies various strategies aimed at mitigating cyberloafing. For instance, the judicious deployment of technological tools (Pelikan et al., 2021) or the implementation of meticulously structured online courses designed to foster active student engagement can effectively reduce the incidence of cyberloafing (Yağmur, 2022). Shroff et al. (2007) suggests robust instructional strategies to counteract students' propensity for diverting their attention toward non-academic pursuits. Furthermore, the development of thoughtfully conceived, technology-enhanced interventions presents an additional viable approach for addressing and preventing cyberloafing (Koyanagi et al., 2021). Empirical evidence suggests that outright prohibitions on internet usage may not effectively curtail cyberloafing. For instance, Tsai et al (2022) underscore the critical role of integrating meta-cognitive learning strategies with technological controls to cultivate self-regulation skills in students, thereby potentially diminishing cyberloafing tendencies. This perspective implies that although bans might restrict immediate access, they often fail to address the underlying behavioral drivers of cyberloafing. Conversely, interventions designed to empower students through meta-cognitive strategies are posited to foster greater ownership over their learning processes, likely leading to more effective outcomes in sustaining focus during academic pursuits. Furthermore, academic literature indicates that the mere prohibition of access can engender resentment or erode students' perceptions of autonomy, potentially culminating in heightened disengagement. Waghid et al. (2021) point out pedagogical interventions should prioritize interaction and engagement rather than exclusion. Consequently, a prohibition, if not complemented by strategies that foster active engagement and intrinsic motivation among students, may paradoxically lead to detrimental outcomes.

Despite the increasing volume of empirical studies, a significant gap remains in the literature. Current research on cyberloafing is highly fragmented, characterized by substantial variation in research designs, theoretical frameworks, and measurement tools. Originating in the health sciences to reduce bias and strengthen evidence-based decision-making, systematic

reviews apply transparent search procedures, explicit inclusion criteria, and structured quality appraisal to produce more reliable and cumulative knowledge (Delgado-Rodríguez & Sillero-Arenas, 2018). Within education, systematic reviews address longstanding challenges related to non-cumulative research traditions, enabling scholars to clarify conceptual inconsistencies, evaluate methodological robustness, and synthesize empirical patterns (Davies, 2000; Gough & Thomas, 2016). Most existing reviews focus narrowly on either the predictors or the outcomes, often neglecting the complex interplay between methodological choices and theoretical orientations. Their structured procedures—such as predefined search strategies, transparent inclusion criteria, and systematic quality appraisal—were designed to address limitations of individual studies, reduce random error, and support high-stakes decision-making in diagnosis, treatment, and prevention. In this regard, systematic reviews became indispensable in settings where policy and practice directly affect health outcomes and where inconsistent or selective evidence could lead to harmful or ineffective interventions. Moreover, higher-order syntheses such as overviews of reviews help integrate findings across multiple systematic reviews, offering stakeholders a coherent and comprehensive understanding of an otherwise fragmented literature (Polanin et al., 2017). Consequently, systematic reviews serve as a critical methodological mechanism for advancing cumulative knowledge and guiding evidence-based interventions in the emerging domain of cyberloafing. Given the conceptual and methodological variability within cyberloafing research, a systematic review is essential for mapping the field, identifying trends, and generating an integrated understanding of existing knowledge.

A systematic examination of research methods, data collection tools, sampling strategies, measurement scales, and theoretical frameworks used in cyberloafing studies is essential for assessing the methodological coherence and evidentiary strength of the field. Given the considerable heterogeneity in study designs and operational definitions across cyberloafing research, identifying these variations allows reviewers to evaluate the extent to which existing findings are comparable, replicable, and generalizable (Gough & Thomas, 2016). Such scrutiny also reveals methodological blind spots—such as overreliance on convenience samples or unvalidated scales—that may undermine construct validity or inflate effect sizes (Davies, 2000). From a cumulative science perspective, clarifying the conceptual and theoretical scaffolding underlying the literature is equally critical, as it determines whether the field is progressing toward a coherent explanatory model or remains fragmented across disparate frameworks.

Beyond methodological mapping, synthesizing empirical evidence on the antecedents, consequences, and preventive strategies associated with cyberloafing is central to generating actionable insights for educational institutions and organizational decision-makers. Systematic evidence synthesis mitigates random error and subjectivity by integrating findings across diverse contexts and measurement approaches, thereby strengthening confidence in observed relationships and effect patterns (Delgado-Rodríguez & Sillero-Arenas, 2018). This is especially important in emerging domains such as cyberloafing, where rapid technological change and behavioral complexity often lead to inconsistent results. By systematically identifying individual-level and contextual predictors, delineating cognitive, emotional, and performance-related outcomes, and evaluating the empirical grounding of recommended interventions, the review contributes to a more theoretically integrated and policy-relevant understanding of cyberloafing (Polanin et al., 2017). Ultimately, this approach supports the development of evidence-informed frameworks capable of guiding both future research and institutional practice.

Despite the growing scholarly interest, Web of Science (WoS) literature shows a lack of comprehensive systematic reviews that address the methodological, theoretical, and measurement dimensions of cyberloafing within educational contexts. This gap highlights the need for a holistic analysis of research trends, theoretical frameworks, study designs, and sample characteristics in cyberloafing studies. This systematic review uniquely contributes to the existing literature by providing the first integrated analysis of Web of Science–indexed studies through the lens of the DISCAR framework. To address this gap, the present study systematically examines cyberloafing-related educational research indexed in the Web of Science database. It aims to synthesize methodological patterns, theoretical approaches, and key findings within a comprehensive framework. By doing so, the study contributes to the existing body of knowledge on cyberloafing and provides a foundation to guide future research. Ultimately, this review offers a critical assessment of the antecedents, consequences, and prevention strategies of cyberloafing based on current scientific evidence and proposes a roadmap for future investigations.

The purpose of this research is to examine the causes and consequences of cyberloafing behavior, as well as the individual, pedagogical, and technological factors that influence it. It also systematically analyzes the theoretical frameworks and recommendations used to prevent cyberloafing. In line with this research objective, the following sub-research questions were addressed:

1. What is the research method used in the studies?
2. What are the data collection methods used in the studies?
3. What are the sample characteristics in the studies?
4. What are the scales used in the studies?
5. What are the theoretical and conceptual frameworks used in the studies?
6. What types of digital devices are included in the studies?
7. What are the causes of cyberloafing in the research results?
8. What are the recommendations for preventing cyberloafing in the research results?
9. What are the consequences of cyberloafing on individuals?

Method

This study conducts a systematic review of articles on the topic of "Cyberloafing" in the Web of Science (WoS) database. The research process was conducted in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines (Moher et al., 2009). Data screening and coding were conducted using the DISCAR stages outlined by (West and Martin, 2024). The data source used in the study is the Web of Science (WoS) database. Educational sciences was selected as the research area in the WoS database, and the search was conducted using the following keywords and boolean operators: (cyberloafing OR "cyber loafing" OR "cyberloaf" OR "cyber loafin" OR "cyberloafers" OR "cyber loafers" OR "personal internet use" OR "non-work internet use")*.

A total of 55 articles were identified. The inclusion criteria for the study in the Wos database were as follows: the article addressed cyberloafing in the context of education, was published in peer-reviewed journals, and had full-text accessibility. Off-topic articles (e.g., cyberloafing in the workplace), book chapters, abstracts, etc., were excluded. In accordance with existing inclusion/exclusion criteria, a final tally of 33 studies was included.

The text file downloaded from the Wos database was converted to csv format using Python. The data was parsed for Authors (AU), Title (TI), Journal (SO), Year (PY), and DOI (DI). The full texts of the articles were downloaded using the DOI information. Records that were not accessible by DOI number were found by searching on sites such as Google Scholar. The full texts were systematically coded by two researchers specializing in educational sciences, and frequency distributions and thematic analysis were conducted. Coding was performed using both inductive and deductive methods using Microsoft Excel. In the first stage,

two researchers coded the same articles (approximately 20% of the total articles). Inter-rater reliability was achieved at 88.6%. In the next stage, the remaining articles were coded independently by the researchers.

Research Method

A review of the articles that clearly articulate their methodological choices reveals a marked predominance of quantitative research designs, suggesting a field still largely driven by measurable indicators and statistical generalization. Approximately 71.43% of the total articles employed a quantitative research approach. This suggests a strong tendency to generalize based on measurable data within the relevant field. The preference for quantitative methods may be related to researchers' desire to obtain results based on statistical analysis and to increase the validity of their findings by working with larger samples.

Table 1

Description of the Research Method

Research Method	f
Quantitative	15
Mixed-method	3
Other (Scale adaptation, compilation, etc.)	2
Qualitative	1

Mixed methods accounted for approximately 14.29% of the data. This rate demonstrates that efforts to offer a more comprehensive perspective by combining both quantitative and qualitative data remain limited. Qualitative methods accounted for 4.76%, while other methods (e.g., scale adaptation, compilation studies) accounted for 9.52%.

Data Collection Method

The vast majority of studies used surveys as the data collection method (87.88%). This suggests that the field is focused on quantitative data and is dominated by hypothesis testing based on statistical analysis. Mixed methods (9.09%) were used to a limited extent, and these studies generally aim to provide contextual depth by combining focus group interviews with surveys.

Table 2

Description of the Data Collection Methods

Data Collection Method	f
Survey	29
Mixed method	3
Compilation (Literature review)	1

These findings demonstrate that qualitative data collection techniques (e.g., interviews, observations) are quite scarce in cyberloafing research. The vast majority of studies (87.88%) used quantitative methods, indicating that the field embraces a methodological approach based on statistical analysis and hypothesis testing. Mixed methods (12.12%) were used to a limited extent, and these studies generally aimed to supplement quantitative findings with qualitative data.

Sample Characteristics

The analysis shows that the sample size in cyberloafing research is largely composed of university students (58.70%). This suggests that the topic has been extensively studied in the context of higher education. High school students (21.74%) are second, indicating that younger age groups are also considered in the research. Teachers (6.52%), employees (4.35%), and mixed groups (8.70%) were used as samples to a lesser extent. This distribution suggests that cyberloafing is primarily considered a student-focused problem.

Table 3

Description of the Sample

Theme	f	%
University Students	27	58.70
High School Students	10	21.74
Mixed (Multiple Groups)	4	8.70
Teachers	3	6.52
Staff	2	4.35

The analysis shows that sample sizes are mostly concentrated in the 200-1000 range (62% total). This suggests that medium-sized sample sizes are preferred in cyberloafing research. However, a single study with a sample size over 10000, due to a meta-analysis or comprehensive study, significantly increased the mean. The median value of 491 suggests that sample sizes are moderate in typical studies.

Table 4

Description of the Sample Size

Sample Size	f
<200	5
200-500	7
501-1000	8
1001-2000	3
2001-10000	0
>10000	1

Data Collection Tools

The analysis shows that the most commonly used measurement tool in cyberloafing research is the Cyberloafing Scale (56.36%). This suggests a strong tendency to measure cyberloafing directly. Addiction scales (10.91%) come second, indicating the existence of studies examining the relationship between technology and internet addiction and cyberloafing. Self-regulation and motivation scales (7.27%) play a significant role in assessing individual behavioral factors. Personality, satisfaction, and various other scales (e.g., self-efficacy, creativity, nomophobia) were used at lower rates. This distribution suggests that the field utilizes a combination of behavioral, psychological, and technology-focused measurement tools.

Table 5

Description of the Themes

Sample Size	f	%
Cyberloafing Scales	31	56.36
Addiction Scales	6	10.91
Self-Regulation Scales	4	7.27
Motivation Scales	4	7.27
Other Scales	5	9.09
Personality Scales	3	5.45
Satisfaction Scales	2	3.64

Finding

Theoretical/Conceptual Framework

The theoretical frameworks of the reviewed studies are predominantly based on behavioral and psychological models and learning theories. The concept of cyberloafing has been addressed primarily within the context of self-regulation and motivation theories, but learning-focused approaches such as Self-Determination Theory, Community of Inquiry Framework, and Social Learning Theory have also been utilized. Concepts such as technology

addiction and emotional regulation are particularly prominent in explaining the effects of smartphone use.

Table 6

Description of the Related Theme

Related Concept (Theme)	f	%
Self-Regulation	21	22.11
Performance / Success	19	20.00
Procrastination	17	17.89
Self-Efficacy	15	15.79
Addiction (Smartphone, Internet vb.)	12	12.63
Motivation	11	11.58

Digital Devices Used

The vast majority of the studies reviewed (66.67%) did not specify the type of digital device used, suggesting that the research did not focus on device-specific details. Among studies that did specify device type, smartphones (27.27%) were by far the most frequently used device. This finding supports the notion that cyberloafing behaviors occur primarily on mobile devices. Computers were reported in only 6.06%.

Table 7

Description of the Digital Devices Used

Digital Devices Used	f	%
No distinction (device not specified)	22	66.67
Smartphones	9	27.27
Computers	2	6.06

Causes of Cyberloafing

The analysis reveals that the causes of cyberloafing are multidimensional. The highest rates are seen in the categories of time management and motivational deficiencies (25.93%) and academic/pedagogical factors (25.93%). This suggests that students' perceptions of course content and teaching methods, as well as their personal planning skills, play a critical role in cyberloafing behavior. Technology addiction (22.22%) ranks third, highlighting the impact of mobile device and internet use on behavior. Other causes include individual psychological factors (e.g., anxiety, fatigue), personality traits (extroversion, neuroticism), and the need for social interaction, all represented by lower rates.

Table 8

Description of the Causes of Cyberloafing

Theme	f	%
Time Management and Motivation	7	**25.93**
Academic/Pedagogical Factors	7	**25.93**
Technology Addiction	6	**22.22**
Individual Psychological Factors	3	11.11
Personality Traits	2	7.41
Social Causes	2	7.41

Cyberloafing Prevention Recommendations

The analysis shows that cyberloafing prevention recommendations mostly focus on pedagogical strategies (38.71%). These recommendations include making lessons more engaging, diversifying teaching methods, and strengthening classroom management. Individual skill development (32.26%) comes second, with self-regulation, self-control, and time management skills being the most frequently emphasized strategies. Institutional awareness and policy recommendations (16.13%) aim to raise awareness of the negative effects of cyberloafing and implement institutional-level regulations. Finally, technical measures (12.90%) encompass technological solutions such as restricting or filtering internet access.

Table 9

Description of the Preventing Strategies

Thema	f	%
Pedagogical Strategies	12	38.71
Individual Skill Development	10	32.26
Institutional Awareness and Policy	5	16.13
Technical Measures	4	12.90

The Consequences of Cyberloafing

The analysis reveals that the most significant consequence of cyberloafing is its negative impact on academic performance (36.36%). These impacts are reported as lower grades, increased risk of falling behind in classes, and even dropping out. Cognitive impacts (22.73%) are second, with distraction, difficulty understanding, and decreased learning productivity prominent. Decreased learning engagement and satisfaction (18.18%) are also noteworthy. Cyberloafing has also been linked to addiction and problematic technology use (13.64%), while psychological impacts (9.09%) include stress and guilt.

Table 10

Description of the Consequences' of Cyberloafing

Thema	f	%
Academic Performance	8	**36.36**
Cognitive Effects	5	22.73
Learning Engagement and Satisfaction	4	18.18
Addiction and Problematic Use	3	13.64
Psychological Effects	2	9.09

Result and Discussion

The distribution of research methods in the systematic review clearly reveals methodological trends in the cyberloafing literature. Findings indicate that the vast majority of studies used quantitative methods. This suggests that the field adopts an approach based on statistical analysis and hypothesis testing. While the dominance of structural equation modeling and regression analysis (Fietzer et al., 2025; Kuppens et al., 2008) provides a robust macro-level view of prevalence, this quantitative saturation suggests that the field is currently trapped in a "measurement fix." By reducing cyberloafing to a set of correlational variables, the literature inadvertently strips the behavior of its situational meaning. The findings also reveal a low use of qualitative methods. This situation highlights the need for qualitative research to deeply understand the psychological, cultural, social and pedagogical dimensions of a complex behavior like cyberloafing (Ndayiragije, 2021; Whelehan et al., 1983). Without qualitative insights, we fail to understand the "lived experience" of the student—the subtle transition from academic engagement to digital escape. This review uniquely argues that the field must move toward "methodological pluralism" to uncover how cultural and social nuances shape digital distractions, which purely statistical models consistently overlook (Craig et al., 2020). This approach would enable researchers to explore the underlying motivations, contextual factors, and individual interpretations that contribute to cyberloafing behaviors, which are often overlooked by purely quantitative methodologies (Dai, 2025). Moreover, a deeper exploration through qualitative studies could uncover emergent themes and unexpected variables that influence cyberloafing, thereby enriching the theoretical frameworks currently employed (Alyahya & Alqahtani, 2022; Fei, 2023). The current systematic review therefore suggests that while quantitative studies offer valuable insights into prevalence and correlational relationships, a more balanced methodological approach, incorporating qualitative and mixed-methods designs, is crucial for a comprehensive understanding of cyberloafing within educational

settings (Alyahya & Alqahtani, 2022). Further, the scarcity of qualitative research may limit the exploration of complex underlying mechanisms and individual perspectives, hindering a comprehensive grasp of this multifaceted phenomenon (Yuan et al., 2022). This imbalance indicates a significant research gap that, if addressed, could yield a more profound understanding of the complex interplay of factors contributing to cyberloafing (Ramírez-Montoya et al., 2022). Furthermore, while scale adaptation and compilation studies contribute to methodological diversity, they remain limited in explaining the cause-effect relationships of the phenomenon (Sivrikova et al., 2023).

The heavy reliance on the survey method confirms a trend toward prioritizing generalizability over depth. However, this review critically notes that the over-dependence on cross-sectional surveys creates a "snapshot" bias. Cyberloafing is a dynamic behavior that fluctuates based on the time of day, the difficulty of the lecture, and even the proximity of peers. The lack of longitudinal or observational data—such as screen-tracking or experience sampling—means that the current evidence base lacks the temporal granularity needed to design real-time interventions. This study highlights that while quantitative data aims for objectivity, the reliance on self-assessment is vulnerable to social desirability bias, potentially underestimating the true extent of the behavior. The quantitative data collection approach is dominant in cyberloafing research, and hypothesis testing based on statistical analysis is at the forefront (Mazman Akar, 2024). However, a limited number of studies used mixed methods, generally aiming to provide contextual depth by combining focus group interviews and surveys (Kutluay & Karaca, 2025). Quantitative research aims to generalize based on measurable variables and produce objective results; therefore, the quantitative research tradition has been strongly favored in the social sciences, especially in recent years (Garip, 2023). This approach enables inference from the sample to the population using tools such as hypothesis testing and parametric statistical methods (Kyriazos & Poga, 2023).

Research findings indicate that the majority of the studies examined were conducted on university students. Research findings indicate that the majority of the studies examined were conducted on university students. While this provides valuable insights into cyberloafing in higher education, it simultaneously creates a significant knowledge gap regarding how cyberloafing manifests, is influenced, and impacts individuals across different educational levels and professional roles. The focus on university students risk overlooking the unique contextual factors and developmental stages that shape cyberloafing behaviors in other populations. This heavy reliance on university student samples might lead to a skewed

understanding of cyberloafing, as the 'causes' (e.g., academic/pedagogical factors, time management and motivation) and 'consequences' (e.g., academic performance, cognitive effects) of cyberloafing are likely to vary significantly across different age groups and professional contexts. For instance, the greater autonomy and self-regulation expected from university students may lead to different cyberloafing patterns compared to high school students, who operate within more structured environments.

This suggests that cyberloafing has been more intensively examined in the literature, particularly in the context of higher education, and that university students' access to digital devices may increase this behavior (Uğur & Koç, 2015). The flexible nature of university environments and the widespread use of online learning tools lead to a higher prevalence of cyberloafing in this group. High school students ranked second, indicating that cyberloafing is not limited to higher education but also exists in secondary education. For this younger demographic, the causes of cyberloafing might shift from primarily self-regulated academic pressures to stronger influences from 'social causes' and 'personality traits' , driven by peer group dynamics and identity formation. Furthermore, 'academic/pedagogical factors' might exert a different kind of influence, as their learning environments are typically more structured and supervised compared to universities. The consequences for high school students might extend beyond academic performance to include developmental impacts on study habits and self-discipline, given their ongoing cognitive and emotional maturatity. Finally, the prevalence of self-assessment measures in these studies, while common, also presents limitations, as self-reported data can be subject to social desirability bias and may not always accurately reflect actual behaviors. Despite these differences, it is crucial to recognize that the increasing ubiquity of digital devices in educational settings across all levels, from primary school to higher education, has fostered an environment where cyberloafing behaviors can proliferate (Metin-Orta & Demirtepe-Saygılı, 2021).

Mixed samples, teachers, and staff have been less frequently studied. This suggests that cyberloafing is addressed more student-focused in the educational context, while limited research exists on teachers and staff. However, previous studies emphasize that teachers' digital attention management and employees' cyberloafing behaviors in the workplace are critical for organizational productivity (Korzynski et al., 2025). For educators and staff, the drivers of cyberloafing are likely distinct, potentially stemming from workplace stress, workload, or job satisfaction rather than solely academic factors. Their 'time management and motivation' issues would be framed within professional responsibilities, and 'individual psychological factors'

might relate more to professional burnout or lack of institutional support. The consequences of cyberloafing for these groups would directly impact not only their professional productivity and instructional quality but also serve as a potential model (or anti-model) for student behavior, thereby having broader systemic implications within educational institutions. Our analysis reveals that the "causes" of cyberloafing are developmentally sensitive. For a university student, it may be an issue of self-regulation; for a high school student, it is likely driven by peer-group dynamics and identity formation. The unique contribution of this review is its call for a "lifespan perspective" on cyberloafing. Furthermore, the neglect of teachers and staff as research subjects suggests that the literature views cyberloafing strictly as a "student problem." By reframing cyberloafing as an organizational and systemic issue within educational institutions, this study advocates for research that includes educators, whose own digital attention management directly influences the classroom's instructional climate.

Research findings indicate that cyberloafing scales were used in the vast majority of the reviewed studies. This suggests that specifically developed scales are widely preferred in the literature for measuring cyberloafing, and that there is a trend toward directly measuring the behavior. These scales aim to systematically assess off-task internet use and distracting online behaviors. Addiction scales, which rank second, reveal the relationship between cyberloafing and technology addiction. Research emphasizes that internet and smartphone addiction increase cyberloafing behavior, and therefore, measuring the level of addiction is important (Aldbyani et al., 2025).

Self-regulation and motivation scales were used to understand the impact of individual factors on cyberloafing. The literature frequently reports that low self-regulation skills and lack of motivation increase cyberloafing (Zhou et al., 2021). Therefore, these scales play a critical role in explaining the causes of the behavior. Other scales, such as personality scales and satisfaction scales, have been used to a lesser extent. Personality traits, particularly factors such as responsibility and self-discipline, have been shown to reduce cyberloafing (Zincir et al., 2023). Satisfaction scales, on the other hand, are intended to understand the relationship between perceptions of the learning environment and cyberloafing behavior.

Research findings indicate that cyberloafing behavior is most strongly associated with self-regulation. This suggests that individuals' online attention management and task focus play a decisive role in cyberloafing. Indeed, the literature considers cyberloafing a behavior explained by a lack of self-regulation, and it has been reported that low self-regulation skills exacerbate this behavior (Park et al., 2024; Zhou et al., 2021). The second-ranked theme,

performance/achievement, highlights the negative effects of cyberloafing on academic and work performance. Studies indicate that cyberloafing reduces productivity (Sheikh et al., 2015) and negatively impacts task performance (Sitzmann & Yeo, 2013), whereas individual factors such as self-efficacy can partially offset this effect (Gist & Gist-Mackey, 2013; Vancouver & Kendall, 2006). The procrastination factor reveals that cyberloafing is closely related to time management problems. It has been frequently reported in the literature that individuals with a high procrastination tendency turn to online distractions to delay tasks (Bakker & Demerouti, 2017; Thatcher et al., 2008).

The self-efficacy theme demonstrates both direct and indirect effects on cyberloafing behavior. High self-efficacy can reduce cyberloafing by making it easier for individuals to remain task-focused; however, some studies indicate that this relationship is complex and may vary depending on contextual factors (Korzynski et al., 2025). The addiction and motivation themes suggest that excessive reliance on technological tools and low intrinsic motivation trigger cyberloafing. Internet and smartphone addiction, in particular, distract individuals in the learning environment and lead them to engage in off-task activities (Levkov & Kitanovikj, 2024).

Research findings indicate that the digital devices used in cyberloafing studies are often not specified. This suggests that the literature generally treats cyberloafing as a device-independent behavior, focusing more on individual and pedagogical factors (Akbulut et al., 2018; Metin-Orta & Demirtepe-Saygılı, 2021; Zhao et al., 2023). However, the lack of a specification of device type highlights the need to examine device-based differences in future research. Smartphones stand out among the devices mentioned. It is frequently reported in the literature that smartphones increase cyberloafing behavior due to their ease of mobile access and constant connectivity (Levkov & Kitanovikj, 2024). The distracting effect of smartphones, particularly in learning environments, can have negative consequences on both academic performance and self-regulation skills. Computers were rarely mentioned under the "devices used" category. This finding suggests that with the proliferation of mobile devices, cyberloafing is increasingly occurring through portable technologies. Indeed, previous studies indicate that computer use occurs mostly in stationary environments and therefore offers more limited opportunities for cyberloafing compared to mobile devices (Korzynski et al., 2025).

Research findings indicate that time management, motivation, and academic/pedagogical factors are the most prominent causes of cyberloafing behavior. The literature indicates that poor time management skills and a lack of motivation increase

cyberloafing, and that students turn to online distractions when they have difficulty staying focused on tasks (Zhou et al., 2021). Pedagogical factors are also particularly relevant to teaching methods and the design of learning environments. The literature emphasizes that interactive and engaging pedagogical design elements (e.g., active learning, interaction-oriented approaches in classroom design, student-centeredness) can reduce cyberloafing and are associated with learning outcomes (Cha et al., 2025; Rapanta et al., 2021). Lack of interaction or monotonous content can trigger cyberloafing.

Technology addiction emerges as a significant determinant of cyberloafing. Internet and smartphone addiction facilitate individuals' inclination toward off-task activities during the learning process. Research shows that the constant accessibility of mobile devices further exacerbates this behavior (Öztürk & Kerse, 2022; Zincir et al., 2023) (Oriji & Johnson, 2024; Levkov & Kitanovikj, 2024). Individual psychological factors and personality traits reveal that cyberloafing is linked to personal tendencies. Stress, anxiety, and low self-regulation skills, in particular, can increase this behavior, while personality traits such as responsibility and self-discipline can reduce it (Korzynski et al., 2025).

Finally, social factors suggest that cyberloafing is linked to group dynamics and social interaction. Some studies indicate that students prefer social media use to maintain social ties or conform to group norms (Hernan et al., 2018; Yu & Sussman, 2020). These findings reveal that cyberloafing is a multidimensional phenomenon and is shaped by the interaction of individual, pedagogical, technological and social factors.

Research findings indicate that pedagogical strategies are the most prominent recommendations for preventing cyberloafing. The literature indicates that diversifying teaching methods, using interactive content, and encouraging students' active participation in the learning process are effective in reducing cyberloafing (Öztürk & Kerse, 2022; Zincir et al., 2023). Constructivist approaches and task-oriented learning strategies, in particular, help prevent distractions. Individual skill development, ranked second, encompasses strengthening students' self-regulation, time management, and digital literacy skills. Research emphasizes that developing self-regulation skills plays a critical role in reducing cyberloafing behavior (Gist & Gist-Mackey, 2013; Sitzmann & Yeo, 2013; Vancouver & Kendall, 2006). Therefore, it is recommended that self-regulation and motivation-enhancing techniques be incorporated into educational programs.

Institutional awareness and policy refer to institutional-level measures to prevent cyberloafing. The literature indicates that clear rules, digital behavior policies, and awareness

campaigns are effective in regulating students' online behavior (Korzynski et al., 2025). Such policies can reduce cyberloafing by establishing clear expectations for both faculty and students. Technical measures include access restrictions, filtering software, and reducing distractions in learning management systems. However, the literature emphasizes that technical measures alone are not sufficient and must be supported by pedagogical and individual strategies (Akbulut et al., 2018; Zhan et al., 2024; Zhao et al., 2023). The combined implementation of pedagogical, individual, institutional, and technical strategies will both improve the quality of learning environments and strengthen students' digital attention management.

Research findings indicate that cyberloafing behavior has the greatest impact on academic performance. It is frequently reported in the literature that cyberloafing negatively impacts academic achievement by causing distraction during the learning process (Kamal et al., 2022; Karabıyık et al., 2021). Particularly in online courses, engaging in off-task activities makes it difficult for students to focus on course material and leads to a decrease in learning outcomes. The cognitive effects factor reveals that cyberloafing negatively impacts information processing and attention management. Research emphasizes that constant online distractions reduce learning effectiveness by increasing cognitive load (Zhou et al., 2021). This can lead students to tend to acquire superficial information rather than deep learning.

The learning engagement and satisfaction factor indicates that cyberloafing reduces students' commitment to the learning process and their satisfaction with courses. The literature indicates that off-task online activities weaken learning motivation and reduce course engagement. Addiction and problematic use are particularly associated with internet and smartphone addiction. Research shows that such addictions facilitate students' inclination toward off-task activities in the learning environment and can make cyberloafing behavior chronic (Wilmer et al., 2017). Psychological effects reveal that cyberloafing is associated with psychological conditions such as stress, anxiety, and distraction. While cyberloafing may provide short-term relief, it can increase academic pressure and anxiety in the long term (Korzynski et al., 2025).

Recommendations

This systematic review reveals several methodological and contextual limitations in cyberloafing research. Firstly, the vast majority of studies rely on quantitative methods, while

the limited use of qualitative and mixed methods hinders a deep understanding of the psychological and pedagogical dimensions of the phenomenon. Furthermore, the samples predominantly consist of university students, underrepresenting teachers, staff, and different age groups. Because most studies have a cross-sectional design, information about the changes in cyberloafing over time and its long-term effects is limited. Using only Web of Science as a data source and language restrictions (mostly English-language studies) narrow the scope of the literature.

Recommendations for future research include increasing methodological diversity, greater use of qualitative and mixed methods, and studies with diverse educational levels and larger sample sizes. Furthermore, future research should prioritize expanding sample diversity beyond university students to include a more robust representation of high school students, teachers, and administrative staff. Investigating cyberloafing in high school settings is critical to understand its early development and the influence of different pedagogical and social structures on younger populations. Similarly, studies focusing on teachers and staff could illuminate how cyberloafing impacts professional effectiveness and, importantly, how educators own digital habits might shape the learning environment and influence student behavior. Such diverse samples are essential for developing comprehensive and context-sensitive prevention and intervention strategies that address the multifaceted nature of cyberloafing across the entire educational ecosystem. This expanded sampling strategy would not only address the current demographic bias but also enable researchers to explore how factors such as developmental stage, professional responsibilities, and institutional culture contribute to unique patterns of cyberloafing, thereby enriching the theoretical models currently used to explain this phenomenon. Furthermore, device-based analyses and longitudinal designs are recommended. Educational institutions should implement digital literacy programs to improve students' self-regulation and time management skills; develop clear institutional-level policies and awareness campaigns; Integrating technical measures with pedagogical strategies can be effective in reducing cyberloafing.

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