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Factors affecting cyberloafing in computer laboratory teaching settings

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article

Abstract

This correlational study investigated the factors affecting cyberloafing behavior in an educational environment, specifically that of a computer laboratory teaching setting. A total of 272 students selected using convenience sampling responded to a questionnaire that collected data about cyberloafing behavior and student demographics, personality type, sense of belonging, motivation, locus of control and teacher evaluation (respect, activities, communication, motivation) as well as computer lab teaching settings and norms. The results indicated that students in computer lab teaching settings cyberloaf mainly for socialization, followed by personal business and news follow-up. Males cyberloaf more frequently than females, especially for personal business and news follow-up. As students' internet skills increase, so does their cyberloafing, particularly for personal business and socialization. A lack of instructor norms in computer lab lectures and student amotivation are also associated with increases in cyberloafing for personal business, whereas instructors' respect for students and negative attitudes towards cyberloafing are associated with decreases in cyberloafing for socialization. This paper discusses the study findings in detail and makes recommendations for additional research.

Keywords: Cyberloafing, Internet use skills, Instructors' norms and respect, Amotivation, Attitude towards cyberloafing, Computer laboratory teaching settings

Introduction

In today's digital era, access to the internet is available to almost everyone, everywhere, whether at home, at work, or at school. Despite the enormous benefits that internet technology offers in terms of learning, the 'inadvisable, excessive and uncontrolled use' of this platform can be harmful (Yılmaz et al., 2015). Cyberloafing is one of the terms used to describe the disruptive behavior of frequent internet usage for personal, non-work-related activities during working hours, often under the guise of doing actual work (Blanchard & Henle, 2008; Lim, 2002), and for non-academic purposes during course hours (Kalaycı, 2010). Such counterproductive behaviors (Dursun et al., 2018; Lim, 2002) include visiting news and discussion sites, social-networking platforms and other virtual communities; checking e-mails; downloading files, including music; online gaming/gambling; and online shopping (Yılmaz & Yurdugül, 2018). Cyberloafing has been observed both at work and in school classrooms,

including computer laboratory teaching settings, where students cyberloaf while they perform tasks or listen to their instructors.

Numerous studies have reported on the increases in student motivation and achievement observed in connection with the use of technology in the classroom (Anwaruddin, 2013; Estapa, & Nadolny, 2015; Kalanzadeh et al., 2014; Mackinnon & Vibert, 2002). While schools cannot ignore the opportunities that digital tools provide for enhancing the learning experience (Tindell & Bohlander, 2012), particularly among today's tech-savvy younger generation, studies have also pinpointed certain adverse effects that accompany the use of technology in the classroom. Computers have been cited as a source of distraction (Fried, 2008) that leads to increases in cyberloafing (Yılmaz et al., 2015) and decreases in learner engagement in connection with increases in opportunities to engage in non-education-related, off-task personal activities (Sivrikova et al., 2019; Skolnik & Puzo, 2008). Not only does multitasking during lessons pose a threat to comprehension (Sana et al., 2013) and lead to impaired learning on the part of the cyberloafer (Ravizza et al., 2013), classmates and teachers also suffer from decreased motivation and distraction as a result (Akgün, 2020). When compared to regular classrooms, students seem to feel freer to cyberloaf in computer laboratories, and they tend to do so even when they have assignments to complete (Yaşar & Yurdugül, 2013). University students have been found to cyberloaf not only with their computers, but with their mobile phones as well (Yılmaz et al., 2015). They often multi-task while studying, using their mobile phones, tablets, laptops, or desktop PCs. Worryingly, the extent of cyberloafing is expected to increase as the number of high-tech mobile devices and opportunities for online connectivity increase and more courses start to require mobile devices and computers (Akbulut et al., 2016).

While the literature includes many studies on cyberloafing in a work environment, the number of published studies on cyberloafing in an educational setting, particularly in a classroom where computers are easily accessible, are relatively limited. In a recent study conducted by Varol and Yıldırım (2019), four factors were found to have an influence on cyberloafing in a school setting, namely (a) the instructor (i.e., instructional methods, material usage, content knowledge and communication skills), (b) course content relevance, student attentiveness and motivation levels, and (c) the learning environment (i.e., classroom seating, lighting and temperature).

The current study investigates the demographic, psychological and academic factors affecting cyberloafing in computer laboratory teaching settings in light of Van Doorn's (2011) theoretical framework described below. The following research questions were formulated accordingly:

1. Do students cyberloaf during their computer laboratory classes? If so, what types of cyberloafing activities do they engage in, and to what extent?
2. Are any of the following predictive of the overall cyberloafing activities identified in the first research question?
 - a. student demographic factors (gender, internet skills, internet experience, and internet use frequency),

- b. student-related individual factors (personality, internal–external locus of control, sense of belonging, attitude towards cyberloafing),
 - c. organizational factors (classroom norms, instructor respect for students),
 - d. loafing activities.
3. Are any of the above-mentioned factors predictive of the specific types of cyberloafing activities identified in the first research question?

Theoretical framework

Van Doorn (2011) offers the only available theoretical framework for cyberloafing. He describes the phenomenon in an organizational setting as a multidimensional construct consisting of different types of activities and behaviors and influenced by organizational policies, the relationship between job demands and resources, additional work and family responsibilities, and individual personalities. Li and Chung (2006) identify four main types of cyberloafing activities: social, which includes both self-expression (e.g., Facebook, Twitter, Instagram) and information-sharing (e.g. Blogger.); informational (e.g., internet searches); leisure (e.g., online gaming, downloading music, downloading software); and virtual emotional activity (e.g., online shopping, dating sites and other unclassifiable activities). Cyberloafing behavior, on the other hand, describes cyberloafing in terms of its consequences, either positive or negative. Positive behaviors include cyberloafing for development, i.e., as a source of learning and skill improvement (Belanger & Van Slyke, 2002) and for recovery, i.e., as a means of reducing discomfort and positively impacting on individual health (Lim & Chen, 2012; McLean et al., 2001), whereas negative behaviors include deviant behavior that reduces productivity (Weatherbee, 2010) and addictive behavior (Young, 2010), i.e., behavior that is problematic and habitual.

Studies of cyberloafing in the workplace have examined how organizational policies related to internet availability, work hours and use of one's own device at work may impact cyberloafing either positively or negatively. With regards to whether or not policies limiting employee usage of the internet are effective in preventing cyberloafing, the results are inconclusive (e.g., Blanchard & Henle, 2008; Lim & Teo, 2005). Lim et al., (2002) and Anandajaran and Simmer (2004) emphasize that both organizational control and individual responsibility play a role in dictating cyberloafing behaviors. The recent trend of allowing/expecting employees to use their own devices for work as part of an effort to reduce organizational expenses on technological infrastructure is a question addressed by Van Doorn (2011), who suggests that employees may be more likely to engage in increased cyberloafing when they use their own devices, as this makes it easier to access personal sites and links. Flexibility in terms of work hours and location represents another emerging trend that may trigger cyberloafing. As Kurland and Bailey (1999) point out, flexible work schedules characterized by a lack of supervision and monitoring may increase the tendency of employees to cyberloaf, especially, when they are not sufficiently informed about the rules.

The relationship between job demands and resources has also been put forward as having a role in cyberloafing behavior (Van Doorn, 2011). Job demands are defined as the work-related stimuli requiring cognitive, emotional and/or physical effort (Jones &

Fletcher, 1996), whereas job resources describe the factors that make it possible to deal with these demands (Hobfoll, 2001). The Demand-Induced Strain Compensation (DISC) model describes job demands and resources in terms of their cognitive, emotional and physical aspects (De Jonge & Dormann, 2006) and suggests that high demands combined with high resources result in active learning and growth in the workplace. By contrast, cyberloafing has reported to be one consequence of a lack of balance between job demands and resources (Henle & Blanchard, 2008; Lim, 2002; Robinson & Bennett, 1995). Specifically, low demand and high resources prompt employees to search for non-work-related activities to kill time when they have no tasks to complete, whereas in cases of high demand and low resources, employees engage in cyberloafing as a form of deviant behavior, either as a means of escape, which carries the potential of addiction (LaRose et al., 2010), or to replenish their resources, which carries the potential of recovery (Weatherbee, 2010). Janssen et al. (2004) noted a connection between high psychological job demands and a lack of balance between work and family, suggesting an interaction between these two factors could lead to cyberloafing, either directly or indirectly.

The “Five Factor” Theory provides a comprehensive explanation of personality traits in terms of five basic dimensions: neuroticism, openness to experience, conscientiousness, extraversion, and agreeableness (Bacanli et al., 2009; Costa, & McCrae, 2011). These dimensions have been suggested as forming the basis of human personality and encompassing the characteristics of human thought, emotion and behavior. While they might manifest in different degrees, all people share the same basic traits regardless of gender, age or culture, (Novikova, 2013). Van Doorn (2011) theorizes the expected relationships between personality traits and cyberloafing based on the relationships identified for internet usage. According to Landers and Lounsbury (2006), neuroticism and openness to experience are unrelated to internet usage, whereas agreeableness, conscientiousness and extraversion are correlated with less frequent usage. Wyatt and Phillips (2005) infer that less agreeable and more introverted individuals are more frequent users of the internet, which represents less of a distraction for more conscientious people.

Literature review

In its effort to identify the factors affecting cyberloafing in educational settings, particularly computer laboratory teaching situations, the current study is grounded mainly in Van Doorn’s (2011) theoretical framework. However, rather than workplace policies and work-related factors, the construct of instructor norms is examined, together with instructor respect and student amotivation. The potential impact of personality is also included in the theoretical model developed here, as are sense of belonging, locus of control and gender, along with internet skills and attitudes towards cyberloafing and loafing. In total, 11 factors and their relationships with cyberloafing are examined, with each factor explained briefly below.

Instructor norms

The Theory of Reasoned Action suggests that subjective norms and attitudes towards a behavior are predictors of behavioral intention (Ajzen, 1991), which then triggers the actual behavior of an individual. Lim (2002) demonstrated subjective norms to be a

determinant of employee cyberloafing, and Blanchard and Henle (2008) demonstrated more specifically that supervisor norms are positively related to minor cyberloafing (e.g., personal use of e-mail and the internet) in the working environment, although they found no relationship between supervisor norms and major cyberloafing (e.g., gambling, chatting, downloading music, visiting adult websites, reading blogs). Based on this finding, it may be suggested that instructor norms, which represent a similar type of social pressure in an educational setting, could influence student conformity to rules or prompt deviant behaviors such as cyberloafing. In fact, the literature suggests that cyberloafing in schools may be prevented through classroom management, including instructor communication skills and motivational ability (Dursun et al., 2018), and controlling processes, such as those relating to team members when working on collaborative tasks (Henle et al., 2009). Conversely, behaviors such as monitoring, rulemaking and punishment can have a negative effect on individuals. For example, de Lara et al. (2006) found cyberloafing and punishment to be positively correlated, and Lim (2002) found that employees who perceived an imbalance in their relationship with their employer were more likely to engage in cyberloafing and other deviant behavior.

Computer laboratory teaching settings

The use of computers for educational purposes in developed countries began in the 1960s at the university level and in the 1970s at the secondary school level. Computers also entered into educational use at the university level in Turkey in the 1960s, although it was not until the mid-1980s that computers were exploited for educational purposes in high schools (Keser & Teker, 2011). At this time, computer laboratories were established in educational settings in order to allow students more time to practice coding and programming, as well as the opportunity to study English, math, geography and other subjects. Many studies have reported computers to increase student interest and motivation (Shi & Bichelmeyer, 2007), which explains their popularity in K12 as well as university settings. However, according to Yaşar and Yurdugül (2013), students tend to take advantage of internet access in computer laboratory teaching settings for personal rather than educational reasons, and a number of studies (Brubaker, 2006; Kalaycı, 2010) have reported that students engage in deviant behavior, including cyberloafing, in computer classes. In addition, Saritepeci (2019) found that student cyberloafing behavior can be significantly affected by unauthorized access to a school's network.

Instructor respect

As members of the millennial generation, today's students are 'digital natives' (Prensky & Berry, 2001) so intimately familiar with digital devices that they treat them like bodily appendages, unable or unwilling to part with them anytime, anywhere. The non-educational use of digital technologies in the classroom often creates conflict between students and their instructors. Understandably, school administrators are continuously looking for ways to decrease cyberloafing in the classroom. Gerow et al. (2010) have found that monitoring on the part of instructors leads to reduction in student cyberloafing in the classroom. Conversely, Yılmaz and Yurdugül (2018) found that the psychosocial environment of the classroom—including teacher support (instructor respect), involvement, investigation, task orientation, cooperation and equity—can affect student

cyberloafing behavior. Educating students on class ethics has also been suggested as a way to decrease cyberloafing (Soh et al., 2018).

Amotivation level

Amotivation, briefly, can be described as the “absence of motivation”, the most important factor to affect learner performance and behavior (Pintrich & De Groot, 1990). The construct, found in self-determination theory (Deci & Ryan, 2002), describes a psychological state in which individuals cannot identify an association between their behavior and the outcome of that behavior. Amotivated and demotivated students harbor little or no reason to engage in classroom learning activities. This motivational deficit has been found to be strongly associated with maladaptive functioning (Cheon, & Reeve, 2015) and a lack of belief in the capacity to perform an activity (Legault et al., 2006).

Classroom boredom, inadequate concentration in class, and psychological stress have also been associated with student amotivation (Vallerand et al., 1992), as have factors such as perceived home–school dissonance and unfavorable student–teacher relationships (Deci & Ryan, 2002). Moreover, amotivation has been shown to be a significant mediator of associations between home-school dissonance, classroom disruptive behavior, and academic cheating (Brown-Wright et al., 2013). While an increase in student motivation is associated with more active and successful learning processes (Zandvliet & Fraser, 2005), a lack of motivation engenders deviant behaviors such as cyberloafing (Yilmaz & Yurdugül, 2018). According to Durak (2019), motivation levels negatively predict cyberloafing behavior in courses where students are able to access social networking sites.

Personality traits

Personality traits are general tendencies and genetic ‘enduring dispositions’ (Loehlin, 1992) that are distinct from abilities (Costa et al., 1995). The Five Factor Theory defines five basic dimensions of personality: neuroticism, openness to experience, conscientiousness, extraversion, and agreeableness (Bacanli et al., 2009). The theory has been used as a framework for examining the associations between personality and a variety of phenomena, such as social networking site usage and addictive tendencies (Wilson et al., 2010), workplace deviance (Hastings & O’Neill, 2009), academic performance (Poropat, 2009), teacher burnout (Cano-García et al., 2005), emotional intelligence (Pishghadam & Sahebjam, 2012) and cyberloafing (Krishnan et al., 2010; O’Neill et al., 2014; Sheikh et al., 2019; Varghese & Barber, 2017).

Sense of belonging

Sense of belonging refers to the degree to which an individual feels accepted, respected, and supported in a community. Sense of belonging has been studied in relation to general school motivation, effort, and expectations of success (Goodenow & Grady, 1993); gang-related problems (Burnett & Walz, 1994); student completion rates (Kember et al., 2001); and academic grades and competence, self-worth, internalizing/externalizing behaviors, and parental education (Pittman & Richmond, 2007), among other phenomena. Individuals who feel a strong sense of belonging to their organization have been found to display less social loafing (Van Dick et al., Van Dick, Stellmacher, et al., 2009;

Van Dick, Tissington, et al., 2009) and may even outperform other groups (Van Dick, Tissington, et al., 2009).

Locus of control

Locus of control provides the framework for Rotter's (1966) Social Learning Theory, which states that individual performance is based on their behavioral expectations. Internal locus of control refers to the belief that personal actions influence external events, whereas external locus of control refers to the belief that success and failure are the outcome of external factors beyond one's control. Cüceloğlu (1996) has elaborated on the Social Learning Theory, noting that it involves a value attached to the expected result of a particular behavior; for example, the level of attention students pay to information is related to the degree to which they believe they are responsible for their own academic success (Burger, 2006). Blanchard and Henle (2008) hypothesized an association between external locus of control and both serious and minor cyberloafing at work.

Gender

The vast majority of studies indicate that in general, males cyberloaf more than females (Baturay & Toker, 2015; Dursun et al., 2018; Hargittai & Shafer, 2006; Lim & Chen, 2012; Saritepeci, 2019; Şenel et al., 2019; Vitak et al., 2011; Yılmaz et al., 2015). When it comes to specific types of cyberloafing, however, various, and somewhat conflicting, gender differences have been reported. For example, Andreassen et al. (2014) found men engage in more social networking, i.e., socialization cyberloafing, during work hours than women, whereas Arabacı (2017) found women engage in more cyberloafing for news follow-up than men. A 2017 study by Akbulut, Dönmez and Dursun reported no gender differences in terms of cyberloafing types with the exception of online gaming/gambling, which was more common among men than women, whereas another study by the same researchers found that males spent more time than females on three types of cyberloafing activities: online gaming/gambling, online shopping, and accessing online content (Dursun et al. 2018).

Internet skill level

Internet skill levels appear to play a role in the types of cyberloafing undertaken. A study examining the association between cyberloafing and internet skill levels reported that students with advanced- and expert-level internet skills cyberloafed more often than students with intermediate-level skills and novice internet users (Baturay & Toker, 2015). Moreover, considering the correlation found between skill level and cyberloafing for socialization, the authors suggested that the development of internet skills triggered socialization behavior in students. Arabacı (2017) found individuals with medium and advanced levels of internet skills engaged in significantly more cyberloafing for personal business than other types of cyberloafing, and Blanchard and Henle (2008) reported internet skills to be positively correlated with minor cyberloafing, e.g., use of e-mail for personal reasons.

Attitude towards cyberloafing

According to Ajzen (1991) attitude is one of three factors explaining a person's intention to engage in a particular behavior. According to the Theory of Reasoned Action (Ajzen, 1985, 1991; Fishbein & Ajzen, 1975), both an individual's attitude, i.e., positive or negative opinion regarding a behavior, and subjective norms, i.e., social influence referent to others, contribute to the intention of performing a behavior. In his subsequent theory, the "Theory of Planned Behavior" (1985), Ajzen expanded his model by adding "perceived behavioral control", defined as the feelings, ideas, and behavioral tendencies of individuals towards objects or events that direct behavior and impact on the occurrence of a behavior (Yılmaz & Yurdugül, 2018). When applied to cyberloafing, it may be said that subjective norms combine with an individual's attitude towards cyberloafing and perceived behavioral control to indirectly contribute to cyberloafing by influencing that individual's intention to cyberloaf, which in turn leads directly to actual cyberloafing (Askew et al., 2011). A study of cyberloafing in the work environment (Lieberman et al., 2011) found attitudes towards cyberloafing, along with employee participation in non-internet loafing behavior, to be positively correlated with cyberloafing. In an educational setting, Soh et al. (2018) found that a positive attitude towards cyberloafing is predictive of a student's intention to cyberloaf, which in turn predicts whether they will perform cyberloafing behavior. Attitudes towards computers and computing courses have also been found to significantly affect student cyberloafing behaviors (Yılmaz & Yurdugül, 2018). Attitudes toward cyberloafing behavior were also found to be significantly associated with perceived societal norms regarding in-class use of cellphones (Knight, 2017).

Loafing

Loafing, sometimes referred to as "free riding", is a type of deviant and disruptive behavior in educational and work-related settings (Mulvey & Klein, 1998). Individuals who perform loafing, or "loafers", have been described as "telephone chatters" and "restroom-minded, long lunchers", as compared to "cyberloafers", who loaf by using the internet (Lim, 2002). Both behaviors are similar in that they involve spending time on non-educational or non-work-related issues, although, notably, cyberloafing provides camouflage to loafers and makes loafing easier. Van Doorn (2011) found that loafing behavior increases with age, and suggested that age has an effect on cyberloafing as well as other forms of loafing.

Method

This study was designed as a correlational study (Creswell, 2012) in order to evaluate the relationships among the 11 factors listed above (independent variables) and three types of cyberloafing, i.e., socialization, personal business and news follow-up (dependent variables). Sample size was determined based on purposive and convenience sampling and the requirements for structural equation modelling (SEM). A number of authors (Boomsma, 1985; Kline, 1998) have suggested a minimum or moderate sample size for SEM to range between 100 and 200, while others have recommended 5–10 observations per estimated parameter (Bentler & Chou, 1987; Bollen, 1989) and 10 cases per variable (Nunnally, 1967). Power analysis conducted prior to data collection for this

study indicated that between 245 (0.80 power) and 493 participants (0.99 power) were required for SEM (MacCallum et al., 1996). Therefore, data collection was halted when 272 participants were reached (SEM: 0.847 power, $df=8$, $RMSEA-H0=0.10$ (mis-fit), and $RMSEA-H1=0.030$ (good-fit), $p=0.05$).

Study participants

A total of 272 students at a university in Turkey voluntarily participated in the study. All participants had at least one social-networking account and had completed a mandatory computer literacy course in a computer laboratory classroom. After receiving a brief explanation of the study purpose, participants were asked to complete a questionnaire (see below, “Measurement tools” section).

Demographic characteristics of the participants, including gender and information on internet usage, are given in Table 1. Of the 272 participants, 122 (44.9%) were male, and 150 were female (55.1%). The average age of participants was 20.95 years ($SD=1.55$). Mean overall GPA of participants and mean grade in the computer literacy course referenced for cyberloafing behavior were 2.91 ($SD=0.46$) and 71.24 ($SD=15.64$), respectively. Most participants (60.3%) rated their internet skills as “intermediate”. More than 85% of participants ($n=239$, 87.9%) stated that they used the internet on a daily basis, and the remaining participants ($n=33$, 12.1%) stated that they used the internet either weekly or monthly. Whereas 77.9% of participants ($n=212$) said they had an average to high level of experience using the internet, the remaining 22.1% ($n=60$) said they had little to no experience.

Table 1 Study participants

	F	%
Gender		
Female	150	55.1
Male	122	44.9
Internet skill level		
Beginner	27	9.9
Intermediate	164	60.3
Advanced	68	25.0
Expert	13	4.8
Internet experience		
No experience	11	4.0
Low level	49	18.0
Average level	129	47.4
High level	58	21.3
Very high level	25	9.2
Frequency of internet usage		
Daily-several times	219	80.5
Daily-once	20	7.4
Weekly-several times	21	7.7
Weekly-once	5	1.8
Monthly-several times	4	1.5
Monthly-once	3	1.1

Measurement tools

Data was collected using a questionnaire that was self-implemented by participating students in a computer laboratory course during the 2019–2020 Fall semester. The questionnaire was comprised of the following:

Demographic information (11 items)

This section collected information on gender and internet skill, experience, and frequency of usage in order to determine the impact of these factors on cyberloafing.

Adjective Based Personality Scale (ABPT) (40 items)

The ABPT was developed by Bacanlı et al. (2009) to measure personality. It is based on instruments used to measure the Big Five personality traits used by psychologists to describe human personality (Costa & McCrae, 1992; Goldberg, 1993). Construct validity of the ABPT was demonstrated by oblimin rotation factor analysis. The ABPT also demonstrated concurrent validity with the Sociotropy-Autonomy Scale, which measures such things as separation anxiety, efforts to satisfy others, and disapproval in relationships (Beck et al., 1988; Savaşır & Şahin, 1997); Reactions to Conflicts (Demirci, 2004); Positive and Negative Affect Schedule (PANAS) (Gençöz, 2000; Watson et al., 1988); and State-Trait Anxiety Inventory (STAI) (Öner & ve Le Compte, 1998; Spielberger, 2010). Test–retest reliability and Cronbach's α for internal consistency indicated the ABPT to have satisfactory psychometric properties and to be suitable for assessing personality traits of undergraduate and graduate students.

Cyberloafing (12 items)

This scale was originally developed by Blanchard and Henle (2008) and adapted to Turkish by Kalaycı (2010). The original instrument included minor and major cyberloafing behaviors as two sub-factors, and applied explanatory factor analysis only. In the Turkish version, both explanatory and second-order confirmatory factor analyses indicated a three-factor scale comprised of personal business, socialization and news follow-up subscales, with reliability measures of 0.83, 0.85, and 0.66, respectively, whereas the overall reliability of the scale was 0.88.

Sense of belonging to the department (4 items)

This scale measured the extent to which participants felt they belonged to the department in which they were studying. Construct validity was determined using EFA [KMO Measure of Sampling Adequacy (0.647); Bartlett's Test of Sphericity ($\chi^2(6) = 453.269$, $p < 0.01$)]. EFA communalities ranged between 0.504–0.721. A single factor explained 62.09 percent of total variance, with item loading ranging between 0.710–0.849, and a Cronbach's α of 0.792.

Attitudes towards cyberloafing (3 items)

This scale measured participant attitudes towards cyberloafing. EFA was used for construct validity [KMO Measure of Sampling Adequacy (0.702); Bartlett's Test of

Sphericity ($\chi^2(3) = 368.755, p < 0.01$)). EFA communalities ranged between 0.734–0.838. A single factor explained 77.13% of total variance, with item loadings ranging between 0.857–0.915, and a Cronbach's α of 0.851.

Loafing (4 items)

This scale measured the daily loafing behavior of participants. EFA was used for construct validity [KMO Measure of Sampling Adequacy (0.656); Bartlett's Test of Sphericity $\chi^2(6) = 147.854, p < 0.01$]. EFA communalities ranged between 0.294–0.614, indicating good fit to data. A single factor explained 48.33 percent of total variance, with item loadings ranging between 0.543–0.783. A Cronbach's α of 0.631 indicated satisfactory internal consistency.

Computer lab teaching settings (9 items)

This scale measured participant perceptions of factors related to computer lab teaching settings. EFA was used for construct validity [KMO Measure of Sampling Adequacy (0.703); Bartlett's Test of Sphericity $\chi^2(36) = 247.038, p < 0.01$], with communalities ranging between 0.307–0.592. Three factors—computer lab teaching settings, instructor responsibility, instructor monitoring of students during class—explained 51.89 percent of total variance. Item loadings for these factors ranged between 0.410–0.742, 0.634–0.749 and 0.491–0.700, respectively. The scale had a Cronbach's α of 0.422, indicating moderate internal consistency.

Norms for cyberloafing (6 items)

This scale measured peer group and instructor norms related to cyberloafing. EFA was used for construct validity [KMO Measure of Sampling Adequacy (0.817) Bartlett's Test of Sphericity ($\chi^2(15) = 774.528, p < 0.01$)], with communalities ranging between 0.719–0.805. Two factors—peer norms and instructor norms—accounted for 76.15 percent of total variance. Item loadings for the factors ranged between 0.854–0.857 and 0.862–0.908, respectively. The scale had a Cronbach's α of 0.857, indicating satisfactory internal consistency. Lower scores on the scale indicate little presence of either instructor or peer-group norms.

Teacher evaluation (15 items)

This scale measured student evaluations of their instructors in computer literacy courses. EFA was used for construct validity [KMO MSA 0.818; Bartlett's Sphericity ($\chi^2(78) = 800.761, p < 0.01$)], with communalities ranging between 0.499–0.662. Four factors—respect, activities, communication, and motivation—accounted for 58.97 percent of total variance, with item loadings ranging between 0.709–0.811 (respect), 0.553–0.807 (activities), 0.606–0.758 (communication) and 0.592–0.841 (motivation). The scale had a Cronbach's α of 0.831, indicating a satisfactory level of internal consistency.

Locus of control (29 items)

The Internal–External Locus of Control scale was originally developed by Rotter (1966). Psychometry and clinical psychology experts reviewed the original version, translating it to Turkish and adjusting it for cultural relevance (Dağ, 1991). Reliability of the Turkish

version of the scale was estimated by calculating Cronbach's α (0.71 for 532 participants), KR-20 (0.68 for 99 participants) and test–retest reliability correlation coefficients (0.83 for 99 participants). EFA yielded seven factors (chance control, political external control, chance and interpersonal control, external control on school achievement, external control on interpersonal relationships, fatalism, political and school achievement external control) that explained 47.7 percent of total variance. Concurrent validity with Rosenbaum's Learned Resourcefulness Scale (Rosenbaum, 1980) and Symptoms Checklist (SCL-90-R) was obtained, with correlation coefficients of 0.29 ($p < 0.001$) and 0.21 ($p < 0.001$), respectively.

Scale of motivation in education (Echelle de Motivation en Éducation) (12 items)

The original scale was developed in French by Vallerand et al. (1992) to measure student motivation in an educational setting. A total of 12 items loaded on four factors that described different types of motivation (intrinsic, integrated, introjected, amotivated). The Turkish version of the scale (Kara, 2008) maintained the original factor structure and accounted for 63.48% of variance, with factor loading ranging between 0.380–0.750. Internal consistency reliability Cronbach's α values were 0.84 for the entire scale and between 0.78–0.80 for the individual factors.

Data analysis

Questionnaire data was entered into an electronic spreadsheet and transferred to the software programs SPSS 22.0 and AMOS 22.0 for analysis. Descriptive analysis (e.g., frequency, percent, mean, standard deviation) was used to identify the types and extent of student cyberloafing behavior during their computer laboratory classes (Research Question 1). Multiple linear regression analysis was performed using the measures described above as independent variables and general cyberloafing behavior as the dependent variable in order to determine the factors affecting cyberloafing in general (Research Question 2). Assumptions were explored prior to the analysis, and no issues were detected. Structural equation modelling (SEM) analysis was performed using the measures described above as independent variables and personal business, socialization and news follow-up cyberloafing as dependent variables in order to determine the factors affecting the three different types of cyberloafing behavior (Research Question 3).

Results

Types of cyberloafing in educational settings

Descriptive statistics related to cyberloafing are presented in Table 2. Overall, more than 50% of participants reported engaging in cyberloafing. The most common type of

Table 2 Types of cyberloafing

	M	SD	Min	Max
Cyberloafing	34.03	9.212	13	65
Personal business	12.48	5.254	6	30
News follow-up	5.76	2.110	2	10
Socialization	15.80	4.540	5	25

Table 3 Coefficients of factors on cyberloafing

	B	SE	B
Constant	17.575**	2.975	
Internet skills	3.319**	0.757	0.250
Instructor norms	0.466**	0.174	0.155
Amotivation	0.456**	0.174	0.149
Instructor respect for students	- 0.698*	0.295	- 0.136
Gender Female (1), Male (2)	2.355*	1.063	.127
Student attitude towards cyberloafing	0.340*	0.168	0.119

N = 272, R² = 17.9%, Adjusted R² = 16.0%, Dashes indicate no value

*p < 0.05, ** p < 0.01

cyberloafing behavior was socialization, reported by 63.2% of participants, followed by news follow-up (52.6%) and personal business (41.6%).

Factors affecting cyberloafing in computer laboratory settings

A stepwise multiple regression analysis model was created to identify the factors determining cyberloafing behavior (Table 3). The results showed that 6 variables explained 17.9 percent of total variance in cyberloafing behavior [$F(6, 265) = 9.605, p < 0.01$].

Of all the factors examined, internet skill level had the greatest impact on cyberloafing, followed by gender, instructor respect for students, instructor norms regarding classroom cyberloafing, student amotivation, and student attitude towards cyberloafing.

Cyberloafing behavior scores increased by 3.319 points when students improved their internet skills one level (e.g., moving from beginner to intermediate, or advanced to expert), with other variables constant. Male students demonstrated more frequent cyberloafing behavior than females, with the cyberloafing score of a male student 2.355 points higher than that of a female student with all other variables constant.

Greater instructor respect for students was associated with a decrease in cyberloafing behavior; with all other variables constant, a one-point increase in the score for instructor respect for students resulted in a 0.698-point decrease in student cyberloafing behavior. Conversely, a one-point increase in the score for instructor norms, indicating greater tolerance for behavior unrelated to class activities, was associated with a 0.466-point increase in student cyberloafing scores.

An increase in student amotivation was also associated with an increase in cyberloafing. With all other variables constant, a one-point increase in student amotivation scores was accompanied by a 0.456-point increase in student cyberloafing behavior scores. Interestingly, although amotivation had an effect on cyberloafing, other motivation types (i.e., introjected, intrinsic, and integrated) did not have a significant impact. Student attitudes towards cyberloafing was also associated with cyberloafing behavior, with more positive attitudes towards cyberloafing accompanied by more cyberloafing behavior. Specifically, with all other variables constant, a one-point increase in the score for attitude towards cyberloafing was accompanied by a 0.340-point increase in cyberloafing behavior score.

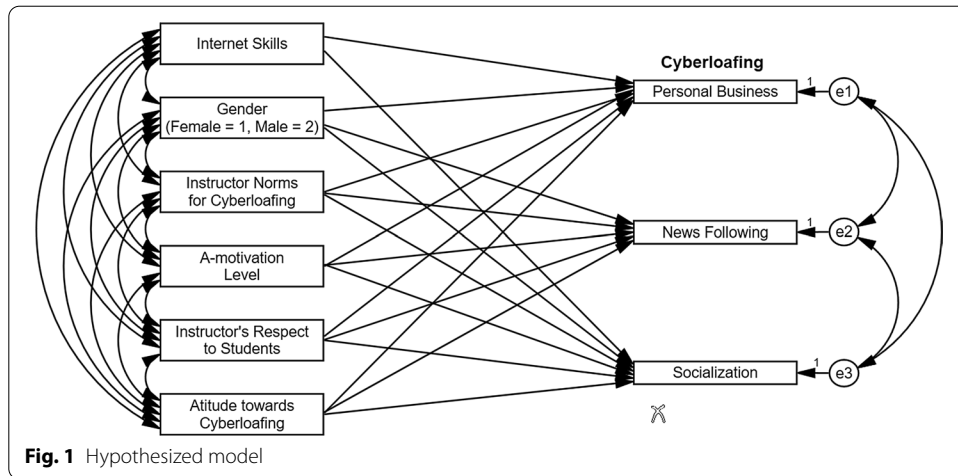


Fig. 1 Hypothesized model

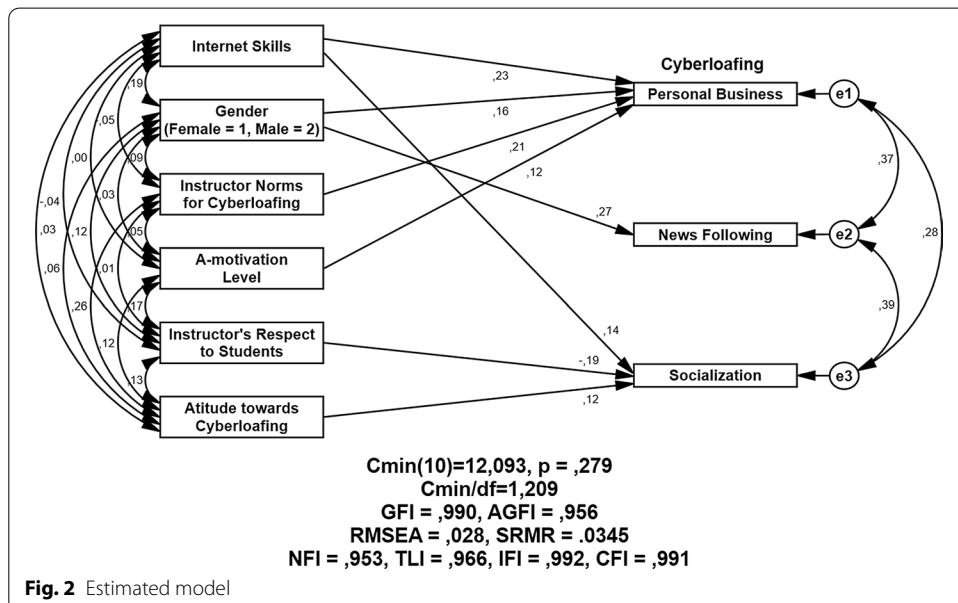


Fig. 2 Estimated model

The impact of demographic, psychological, and academic factors on different types of cyberloafing

Figure 1 provides an illustration of the relationships between the individual factors included in the hypothesized model and the three sub-scales of cyberloafing. A thorough analysis of the data demonstrated significant associations between internet skill level and cyberloafing for personal business and socialization; gender and cyberloafing for personal business and news follow-up; instructor norms and cyberloafing for personal business; amotivation level and cyberloafing for personal business; instructor respect for students and cyberloafing for socialization; and student attitude towards cyberloafing and cyberloafing for socialization. Based on these findings, a new model was developed that excluded non-significant relationships. The standard estimates of the final model are included in Fig. 2.

As Fig. 2 shows, internet skill level had a somewhat higher effect on cyberloafing for personal business than for socialization. Specifically, in computer lab teaching settings, students with higher internet skills tended to cyberloaf mostly for personal business, but also for socialization. In terms of gender, males tended to cyberloaf for personal business and news follow-up more than women, with a greater gender difference observed in news follow-up cyberloafing. Both a lack of instructor norms and student amotivation were associated with cyberloafing for personal business, but not with other forms of cyberloafing. When students were amotivated and instructor norms for cyberloafing were lacking, students would cyberloaf for personal business. Cyberloafing for socialization was affected by both instructor respect for students and student attitude towards cyberloafing. Whereas cyberloafing for socialization tended to increase with more positive student attitudes towards cyberloafing, it tended to decrease in connection with an increase in instructor respect for students.

Table 4 presents an evaluation of the fit indices of the model used to estimate the impact of all variables on specific types of cyberloafing behavior. Given that all the values were found to meet the special fit index criteria mentioned in the literature, the model can be considered valid for describing the study sample.

Discussion

Despite the existence of a theoretical framework and numerous studies on cyberloafing in work settings, studies in educational settings are scarce. The present study attempted to take the theoretical framework developed by Van Doorn (2011) specifically for work settings and adapt it to educational settings. In this regard, instructor norms and respect for students were examined rather than supervisor norms to represent organizational policies, and in place of job resources, a construct that is not described in detail in Van Doorn’s theory, motivation was investigated as a resource-related construct in an educational setting. In addition to demographic characteristics, which included gender as well as factors related to internet-usage, sense of belonging and locus of control were examined as possible individual antecedents to cyberloafing, and attitudes towards cyberloafing and loafing were examined along with cyberloafing activities and behaviors.

The final model developed included six factors identified as being associated with cyberloafing behavior. Internet skill level had the greatest impact, followed by gender,

Table 4 Evaluation of model fit indices

Fit index	Model value	Criteria for perfect fit	Resource
χ^2 (3)	12.093 and $p=0.279$	Low χ^2 value and $p > 0.05$	Hooper et al. (2008)
χ^2/df	1.209	$\chi^2/df < 3$	Wheaton et al. (1977), Tabachnick and Fidell (2007)
RMSEA	0.028	RMSEA < 0.05	Hu and Bentler (1999), Steiger (2007)
SRMR	0.0345	SRMR \leq 0.05	Byrne (1998), Diamantopoulos and Siguaw (2000)
GFI	0.990	$0.95 \leq$ GFI \leq 1	Tabachnick and Fidell (2007), Miles and Shevlin (2007)
AGFI	0.956	$0.85 \leq$ AGFI \leq 1	Tabachnick and Fidell (2007)
CFI	0.991	$2.97 \leq$ CFI \leq 1	Hu and Bentler (1999)
IFI	0.992	$0.95 \leq$ IFI \leq 0.95	Miles and Shevlin (2007)
NNFI	0.953	$0.97 \leq$ NNFI \leq 1	Hu and Bentler (1999), Fan et al. (1999)

instructor respect for students, instructor norms regarding classroom cyberloafing, student amotivation, and student attitude towards cyberloafing. The remaining factors examined had no demonstrable effect on cyberloafing behavior.

The finding that increases in internet skill levels are accompanied by increases in cyberloafing behavior is not surprising and has been demonstrated by several previous studies (Arabaci, 2017; Baturay & Toker, 2015; Blanchard & Henle, 2008). However, whereas previous studies demonstrated a uniform effect on cyberloafing, the current study found cyberloafing for personal business and socialization to be affected more than cyberloafing for news follow-up (Arabaci, 2017; Baturay & Toker, 2015). Internet experience and frequency of use were also analyzed as potential factors involved in cyberloafing, but no associations were identified.

Previous studies have highlighted the fact that cyberloafing behavior is more frequent among men than women (Baturay & Toker, 2015; Dursun et al., 2018; Hargittai & Shafer, 2006; Lim & Chen, 2012; Vitak et al., 2011; Yilmaz et al., 2015). The present study supports this assumption. Moreover, when types of cyberloafing are examined in detail, it becomes clear that men and women exhibit different patterns of cyberloafing behavior. For example, this study found that males tend to spend more time cyberloafing for personal business and news follow-up, which is in line with a previous study (Baturay & Toker, 2015). Cyberloafing for socialization, gaming and gambling, and shopping (Akbulut et al., 2017; Andreassen et al., 2014; Dursun et al., 2018) have also been reported to occur more frequently among men than women; however, according to Arabaci (2017), cyberloafing for news follow-up is more common among women. While it appears that there are differences in the cyberloafing behavior of men and women, more research is required to understand these differences in detail.

Similar to Van Doorn's findings for organizational antecedents, this study found instructor norms in computer lab settings to be associated with decreases in cyberloafing. This is in line with the literature that states the presence of norms, whether those of managers in a work setting or instructors in an educational setting, is associated with decreased cyberloafing. With regard to work settings, Anandarajan and Simmers (2004) demonstrated that supervisor norms may affect cyberloafing in general, and Blanchard and Henle (2008) reported a more specific association between supervisor norms and minor cyberloafing, such as checking and sending non-work-related emails; visiting news, financial and sports sites; shopping online; and participating in online auctions. In an educational setting, the literature suggests that classroom management, monitoring and controlling processes may prevent cyberloafing (Blanchard & Henle, 2008; Dursun et al., 2018; Henle et al., 2009; de Lara et al., 2006).

Although norms may play a large role in determining cyberloafing behavior, this construct needs to be examined with great care in relation to short-term versus long-term impact. Establishing overly harsh norms carries with it the huge potential of generating unintended mild or severe consequences, including amotivation, dissatisfaction, sabotage and espionage as forms of payback. The enforcement of harsh rules with harsh punishment has been shown to have a negative effect on individuals (Lim, 2002; de Lara et al., 2006). According to Ugrin et al. (2018). Cyberloafing may function as a form of revenge behavior in response to disciplinary action, as individuals

justify their cyberloafing behavior as a legitimate response to punishment and a means of balancing power.

It should also be noted that cyberloafing may be a behavior used to cope with stress (Lim & Chen, 2012), regain energy (Bridegan, 2008) and support creativity (Oravec, 2002). While some managers feel that employees should never engage in personal use of the web at work, others believe this can help employees maintain balance in their lives. Striking a balance in the implementation of norms that falls somewhere between that of cyber-bureaucrats, who believe in strict adherence to all norms, and cyber-humanists, who recognize that cyberloafing can help individuals recover from emotional and physical exhaustion (Van Doorn, 2011), may help to avoid the adverse “payback” effects mentioned above.

According to Yilmaz and Yurdugül (2018), student cyberloafing may be an attempt at behavior that balances a perceived lack of respect on the part of instructors as well as strict instructor norms against cyberloafing. A similar situation has been observed in work settings where job demands exceed job resources (Lim, 2002; Robinson & Bennett, 1995). Under such circumstances, cyberloafing may become a deviant behavior used to avoid an unpleasant situation (Van Doorn, 2011). Cyberloafing activities and behaviors that are triggered and/or legitimized by an unpleasant situation can spread rapidly among students. In other words, when instructors do not show respect for their students, their students may respond by cyberloafing in their classes.

Studies have reported that students will start to engage in cyberloafing when they lose motivation and interest and are unable to concentrate on their lessons (Sana et al., 2013; Yilmaz & Yurdugül, 2018). In line with these findings, the current study found amotivation to be associated with increased cyberloafing, especially for personal business. It is possible that amotivation and cyberloafing behavior both increase when students are unsure about why they are attending university and don't see potential benefits of their education. Interestingly, no other types of motivation (intrinsic, integrated, introjected) were associated with cyberloafing, either positively or negatively. As Yilmaz and Yurdugül (2018) note, motivation is a complicated construct that may be indirectly affected by numerous factors, including classroom setting and atmosphere, attitude, and teaching and learning strategies. An example of this complicated interaction can be found in Barry et al. (2015), in which students gave the need to pay attention during a limited amount of class time, particularly when the lesson was demanding, as the reason for not using mobile phones during their lessons.

Conversely, students may use cyberloafing to increase their motivation and interest as well as their ability to concentrate on a lesson. Bridegan (2008) suggested that students may cyberloaf with the sole aim of clearing their minds while performing a task, which is similar to Wagner et al.'s (2012) claim that cyberloafing in a work setting may help decrease an individual's mental workload and provide cognitive relaxation. This seems to contradict Van Doorn's (2011) model with regard to the negative effects of demand-resource imbalances on well-being and motivation, but it is in line with the suggestion that cyberloafing should be tolerated to a certain extent (Yilmaz & Yurdugül, 2018). Based on the findings of the present study, it is impossible to state that convincingly that amotivated students are likely to cyberloaf and motivated students are not; however, the

findings do provide preliminary evidence for a relationship between cyberloafing and amotivation, which may indeed be a reciprocal relationship.

The current study also confirmed the literature stating that a positive attitude towards cyberloafing has an effect on cyberloafing behavior in an educational setting (Knight, 2017; Soh et al., 2018; Yilmaz & Yurdugül, 2018). According to Ajzen (1991), student attitudes towards cyberloafing influence their intention to cyberloaf, which in turn influences their behavior, and several studies have demonstrated an association between attitude and intention to cyberloaf in workplace situations (Askew et al., 2014; Moody & Siponen, 2013; Pee et al., 2008). In the present study, a positive attitude towards cyberloafing was found to be associated specifically with cyberloafing for socialization, but not with cyberloafing for personal business or news follow-up. It is possible that the attitude towards cyberloafing stimulates the intention to perform cyberloafing for socialization, which then leads to cyberloafing behavior, but further studies are required to clarify this assumption.

Whereas sense of belonging and external locus of control were associated with increased cyberloafing in work settings (Blanchard & Henle, 2008; Van Dick, Tissington, et al., 2009), and the personal traits of conscientiousness, extraversion, honesty, and agreeableness were associated with decreased cyberloafing in both traditional and distance work settings (O'Neill et al., 2014; Van Doorn, 2011; Wyatt & Phillips, 2005), the present study found no evidence that these factors had any predictive value in determining cyberloafing behavior in an educational setting. This may be due to certain difference between educational and work settings.

Finally, this study found no relationship between loafing and cyberloafing, which may have to do with the age of the study population. As discussed by Van Doorn (2011), loafing may be more specific to older individuals, who may take coffee breaks, smoke, read newspapers, or talk on the phone rather than engage in cyberloafing. While it is possible that age may explain the difference between loafing and cyberloafing, it is also possible that technological skill level plays a role. Younger individuals tend to have greater technological competence than older individuals, and an increase in cyberloafing in conjunction with an increase in internet skill level was noted in this study.

Implications for practice

The current study provides valuable clues on how cyberloafing can be monitored and exploited to improve student motivation. First, instructors need to establish clear rules for internet usage in computer-based classroom settings, but these rules need to be flexible enough to allow students to take advantage of cyberloafing to relax and eliminate their mental stress loads. Instructors should keep in mind that if students feel they are respected, they will be less likely to cyberloaf and more likely to pay attention to lectures. In order to maintain student interest, instructors can provide extra responsibilities to students who may be more inclined to perform cyberloafing, such as male students with high internet skill levels and low levels of motivation.

Students who are proficient internet users are especially prone to cyberloafing—and they may need to be reminded that, as the saying goes, “With great powers come great responsibilities.” Here, we might adapt another saying—“Drink Responsibly,” which is aimed at preventing drunk driving—to “Use Responsibly,” in order to prevent a different

type of deviant behavior, cyberloafing. An effective training program that focuses on the negative consequences of cyberloafing and warns students about ineffective and inefficient use of technology during class hours (Soh et al. 2018) could be included in an “ethics in computing curriculum”, and development of such a comprehensive training program could be the subject of future design-based research studies.

Limitations of the study

This study has a number of limitations associated with the sample design. Data was collected using an online questionnaire, which represents a type of convenience sampling rather than random sampling; therefore, the study findings cannot be generalized. While purposive and convenience sampling strategies are unable to represent the population due to lack of randomness, their use is fairly common in educational research, where constraints such as time, money, and resources make random sampling infeasible (Wallen & Fraenkel, 2001).

Another limitation in connection with the online survey methodology used is that it relied on self-selection by participants, and thus a non-response rate cannot be calculated (Thompson et al., 2003). For this reason, characteristics of respondents and non-respondents cannot be compared (Guerra, 2003), making inherent bias in the study sample unavoidable (Leigh & Tracey, 2010).

Finally, the self-reported nature of the survey data represents another limitation. Self-report surveys are considered appropriate when individuals’ personal experiences and opinions are the main emphasis of research (“Self-Report Method,” 2008). Self-reported data is presumed to provide a picture of the actual feelings and opinions of study participants; however, the confidential, anonymous nature of self-reporting makes data verification impossible (Witucki, 2006).

As Wright (2005) has stated, proper sampling is one of the major obstacles of survey research and has an impact on generalization. Future studies may attempt to collect data from different study populations and use larger sample sizes, and, if random sampling is possible, the study findings will then be generalizable to the wider population.

Conclusion

The current study examined various factors that could affect cyberloafing in an educational setting, namely a computer laboratory lecture class. Internet skills, gender (male), lack of instructor norms regarding cyberloafing, student amotivation and positive attitudes towards cyberloafing were associated with increases in cyberloafing behavior, whereas instructor respect for students was associated with decreases in cyberloafing behavior. When specific types of cyberloafing were examined, the study found internet skill level, gender, instructor norms and amotivation to be associated with cyberloafing for personal business; gender, instructor norms and amotivation to be associated with cyberloafing for news follow-up; and internet skill level, instructor respect for students, and student attitudes towards cyberloafing to be associated with cyberloafing for socialization. Considering the negative outcomes that may be associated with cyberloafing, future studies should be conducted that look at cyberloafing in different educational settings (e.g., in-person vs online learning) and using different devices (e.g., mobile

phones and tablets vs computers) in order to develop more effective interventions for limiting cyberloafing.

As noted by Varol and Yildirim (2019), educators will be able to provide more effective learning environments for their learners when they are able to establish more effective methods for preventing cyberloafing. In this regard, a number of areas can be suggested for future research to obtain additional data that can be used to extend and validate the model for educational settings developed by the present study.

First, the model developed by Von Doorn (2011) for work settings that formed the basis of this study can be explored in different types of educational settings, including both live lectures and online classes. The various gender differences identified in this study can be further researched to include clustering gender-specific cyberloafing behaviors performed by either men, women, or both genders. Interactions between “internet skill level” and other constructs can also be investigated to provide a more detailed understanding of the mechanisms affecting different types of cyberloafing.

Considering that rules and punishment may actually encourage behavior as well as encourage it, an eclectic composite of instructors that include both cyber-bureaucrats and cyber-humanists may be included in future studies to identify the direction and magnitude of the association between cyberloafing and instructor norms/institutional policies. In this regard, studies may investigate the effects of different strategies for instituting norms. Similarly, since instructor respect for students was identified as another factor influencing cyberloafing, its positive impact on cyberloafing should be examined in the future.

Motivation and cyberloafing may have a reciprocal relationship, with amotivation leading to cyberloafing on the other hand, and cyberloafing being used to relax and regain motivation on the other. Future studies may examine both aspects of this relationship. Finally, as noted above, future studies should investigate the potential of attitude towards cyberloafing to excite intention as well as actual behavior, especially with regard to cyberloafing for socialization.

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Authors' contributions

ST carried out the data instrument preparation, data collection, data analysis, and reporting of the findings. Moreover, ST wrote the Theoretical Framework, Method, Results sections, and contributed to Discussion and Conclusion sections. MHB wrote Introduction, Literature Review, and contributed to Discussion and Conclusion sections. Both ST and MHB participated in the overall arrangement of all progressing drafts. Both authors read and approved the final manuscript.

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Competing interests

The authors declare that they have no competing interests.

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