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What College Instructors Can Do About Student Cyber-slacking

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Abstract Today's traditional-aged college students are avid users of mobile technology. Commonly referred to as the Net Generation, today's college students spend several hours each day using their smart phones, iPads, and laptops. Although some scholars initially opined that the Net Generation would grow into technologically savvy digital natives who would leverage their unprecedented access to technology for professional and academic betterment, contemporary research has rejected the digital native myth. Instead, college students frequently use mobile technology for off-task purposes while attending classroom lectures or doing schoolwork outside of class—a phenomenon known as cyber-slacking. This article provides college educators with an overview of the frequency and consequences of cyber-slacking inside and outside the classroom and seven instructional implications for curbing cyber-slacking. Proposed strategies for curbing cyber-slacking include rejecting the digital native myth, adopting and enforcing technology policies, consciousness raising, motivating students to relinquish their devices, incorporating active learning in the classroom, using mobile technology as a teaching tool, teaching students to be self-regulated learners, and motivating students to delay gratification from their mobile devices.

Keywords College students · Cyber-slacking · Technology · Pedagogy · Self-regulation

The presence of mobile technology (e.g., smart phones, laptops) has changed how college students and instructors approach classroom learning (Baker et al. 2012; Berry and Westfall 2015; Tindell and Bohlander 2012) and how students approach learning outside of class

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(Mokharti et al. 2015). To illustrate this phenomenon, consider the experiences of Eric, an undergraduate student in a biology class, and his instructor, Dr. Sousa.

As Dr. Sousa organizes her materials before starting class, she notices Eric and many other students using smart phones. To avoid the phones being a distraction, Dr. Sousa asks students to put their phones away and reminds them of her “no cell phone” policy. Like most of his classmates, Eric slips his phone into his pocket. Several minutes into class, Eric feels the familiar vibration of his phone and pulls it from his pocket and notices a text message from a friend. After Eric exchanges about a dozen text messages, Dr. Sousa finally notices Eric using his phone. She asks him to put the phone away and again reminds him of her cell phone policy. Ten minutes later, Eric pulls his phone back out and begins using it again. Following Dr. Sousa’s lecture, Eric’s cell phone use leaves him with incomplete notes and with the feeling that he missed much of the lesson. It leaves Dr. Sousa wondering what else she can do to keep students from using mobile devices inappropriately during class.

For Eric, however, the story is just beginning. Because texting caused Eric to miss much of his biology lecture, he goes to the library to study for the upcoming biology quiz. Once in the library, Eric turns on his laptop and opens the PowerPoint slides Dr. Sousa uploaded to their course website. Eric also opens a separate navigation window and logs into Facebook. Throughout the 1-h “study session,” Eric toggles back and forth between the course materials and Facebook, spending nearly equal time on each, thereby reducing actual study time and learning. In the end, Eric’s cyber-slacking in and out of the classroom reduces his biology learning and leads to a D grade on the biology quiz.

Scholars such as Prensky (2001a) and Howe and Strauss (2000) once opined that college students like Eric would naturally leverage readily available mobile technology devices to their professional and academic benefit, rather than be distracted and debilitated by them. Often referred to as the Net Generation (Tapscott 1998), today’s traditional-aged college students grew up during a time when the Internet, mobile devices, and social media became ubiquitous parts of society (Tapscott 2008). Members of the Net Generation have logged thousands of hours sending and receiving text messages, shopping online, using video conference services (e.g., Skype) to communicate with family and friends, and sharing information about their lives through social media. These experiences have transformed the Net Generation into avid mobile technology users. In fact, Net Generation college students spend nearly 5 h/day using their devices (Lepp et al. 2015)—sending over 150 text messages (Wentworth and Middleton 2014) and logging nearly 100 min on Facebook (Junco 2012). Although some scholars such as Prensky (2001a) initially believed that Net Generation members would grow into technologically savvy “digital natives,” contemporary literature suggests otherwise. Switzer and Switzer (2013), for example, contend that Net Generation members, although experienced at using mobile technology for social and entertainment purposes, fail to apply technology for their professional or academic betterment. Similarly, Thompson (2013) found that Net Generation members frequently use technology for social or leisure purposes (e.g., texting, social networking, playing games) but minimally use it for professional or academic purposes (e.g., contributing to a Wiki) aside from what is required of them by instructors or employers.

Instead of leveraging technology for their personal betterment, the Net Generation is often pulled off-task by mobile technology, whether they are working (Vitak et al. 2011), driving (Atchley et al. 2011; Hill et al. 2015), on a date (Harrison and Gilmore 2012), attending a classroom lecture (e.g., Lawson and Henderson 2015; Taneja et al. 2015), doing homework (e.g., Junco and Cotten 2012), or studying (Rosen et al. 2013). Meanwhile, using mobile technology for off-task purposes while handling academic tasks has been associated with detriments to

homework completion rates (e.g., Junco and Cotten 2012), test scores (e.g., Bjornsen and Archer 2015), final course grades (e.g., Lepp et al. 2014), and more. This phenomenon, wherein individuals use mobile technology for off-task purposes, is commonly referred to as cyber-slacking (Gerow et al. 2010; Taneja et al. 2015) and is indicative of how the Net Generation is not predisposed to exploit technology for their professional or academic betterment.

Although cyber-slacking is a relatively new educational phenomenon, students succumbing to distractions is not. Student misbehavior has long been identified as an obstacle to learning in both K-12 (e.g., Boice 1996; Dreikurs et al. 1971; Stebbins 1971) and college settings (Bembenutty and Karabenick 1998; Boice 1996). In fact, many off-task activities (e.g., studying for other classes, holding side conversations) prevalent in previous decades are still prevalent among today's students (Johnson et al. 2017). In this sense, student cyber-slacking represents a new means for continuing the age-old practice of off-task behavior.

Although off-task behavior is not a new phenomenon, the nature of how students use mobile technology today has positioned cyber-slacking as a more potent distraction source than those faced by previous generations of students. For instance, college students have described how habitual use of social media and mobile devices has created a situation wherein it is difficult to suppress this habituated behavior while attending classroom lectures or while doing schoolwork outside of class (Flanigan and Babchuk 2015). Similarly, college students indicated that habitually checking websites (e.g., Facebook) for leisure purposes outside of the classroom makes it difficult to resist the temptation to check those websites while using a laptop during class (Aagaard 2015). Moreover, scholars have proposed that compulsive mobile technology use has reached the point of addiction for many college-aged students (e.g., Griffiths 2000, 2012; Roberts et al. 2014). The addictive nature of mobile technology differs from traditional forms of distraction, such as doodling or talking to a nearby student, that often arise from situational influences such as boredom (e.g., Aldridge and DeLucia 1989) rather than from habit or addiction. Thus, chronic and addictive use of mobile technology has rendered cyber-slacking a more tempting source of academic distraction for modern students than the traditional distractions faced by students in previous generations.

Persistent access to mobile technology has created a situation wherein college students frequently cyber-slack when they should be focused on learning. As espoused in Wilbert McKeachie's widely read *McKeachie's Teaching Tips* (e.g., Svinicki and McKeachie 2014), college instructors have an obligation to provide students with classroom environments conducive to learning and to teach students how to guide their own learning outside the classroom. Considering the negative outcomes associated with cyber-slacking, McKeachie's writings suggest that college instructors should minimize the impact that cyber-slacking has on student learning. This research-based advice-for-practitioners article is intended to help college instructors combat cyber-slacking. First, the article overviews research on college students' cyber-slacking tendencies inside and outside of the classroom to give instructors an understanding of the scope and severity of this phenomenon. Second, it offers eight instructor recommendations to minimize student cyber-slacking inside and outside the classroom.

College Students Cyber-slacking

College students frequently cyber-slack while attending classroom lectures or while studying and completing homework outside of class. The following two subsections discuss the frequency and consequences of cyber-slacking inside and outside the classroom.

Cyber-slacking Inside the Classroom

Cyber-slacking is a regular occurrence in college classrooms across the USA. Seventy to ninety percent of college students regularly text during class (e.g., Kornhauser et al. 2016; McCoy 2016)—sending an average of 12 texts per class period (Pettijohn et al. 2015). In fact, 54% of college students believe texting should be allowed in class (Emanuel 2013). Additionally, 25 to 60% of college students bring their laptops to class (Aguilar-Roca et al. 2012; Ragan et al. 2014) and spend up to 60% of class time using laptops for non-class-related activities (Fried 2008; Kraushaar and Novak 2010; Ragan et al. 2014). Unfortunately, experimental and self-report studies have linked classroom cyber-slacking with diminished (a) note taking (Kuznekoff and Titsworth 2013; Kuznekoff et al. 2015), (b) course test scores (Bjornsen and Archer 2015; Ravizza et al. 2014), (c) course grades (Clayson and Haley 2013), and (d) cumulative college grade-point average (Bellur et al. 2015).

Cyber-slacking Outside the Classroom

Net Generation students also frequently use mobile devices while doing schoolwork outside the classroom. Calderwood et al. (2014), for example, observed college students studying over a 3-h period while having access to their mobile devices. During that period, students were pulled off-task by their mobile devices an average of 35 times. Similarly, Rosen et al. (2013) observed that college students stayed on task for only 65% of a 15-min study period—giving into the temptation to cyber-slack once every 5 min. These findings align with self-report studies indicating that more than 60% of college students use mobile devices for off-task purposes while doing schoolwork outside of class (e.g., Jacobsen and Forste 2011; Mokharti et al. 2015), which regularly includes spending an hour on Facebook and sending 70-plus text messages per day while doing schoolwork (Junco and Cotten 2012). These cyber-slacking behaviors have deleterious effects on student achievement. Indeed, cyber-slacking outside the classroom has been linked to reductions in (a) time spent studying (e.g., Calderwood et al. 2014; Wentworth and Middleton 2014), (b) homework assignment performance (Calderwood et al. 2016), (c) homework completion rates (Junco and Cotten 2012), (d) course grades (e.g., Lepp et al. 2014; Ravizza et al. 2014), and (e) cumulative college grade-point average (e.g., Junco and Cotten 2012; Rosen et al. 2013).

Recommendations for Instructors

In this article's opening scenario, college student Eric gave into the temptation to cyber-slack inside and outside of class, and he paid the price with inattentiveness, wasted time, incomplete notes, and low achievement. Eric's cyber-slacking ways and their detrimental consequences were supported by the literature reviewed thus far. Eric's instructor, Dr. Sousa, meanwhile, was seemingly powerless to curtail cyber-slacking despite her best efforts and was left wondering what else she might do. Dr. Sousa's struggle to reduce students' mobile technology use is the norm for many college instructors (e.g., Langmia and Glass 2014; Tindell and Bohlander 2012). Fortunately, promising solutions exist. This section offers eight instructor recommendations to minimize students' cyber-slacking inside and outside the classroom. Table 1 summarizes these recommendations.

Reject the Digital Native Myth

The Net Generation is not composed of digital natives who naturally leverage technology for their academic and professional betterment (Switzer and Switzer 2013; Thompson 2013). Instead, college students frequently succumb to the temptation to cyber-slack while trying to learn inside and outside the classroom (e.g., Calderwood et al. 2014; Emanuel 2013; McCoy 2016) and experience negative consequences as a result (e.g., Calderwood et al. 2016; Dietz and Henrich 2014; Kuznekoff et al. 2015). College instructors must, therefore, recognize that students are not so tech-savvy that they can use technology and learn at the same time. More specifically, college instructors must understand cyber-slacking frequency and consequences, as described in this article, as a precursor for reducing it.

Adopt and Enforce Technology Policies

More than half of all college students agree that technology policies in course syllabi reduce cyber-slacking in the classroom (e.g., McCoy 2016). However, instructors inconsistently enforce these policies, which hinders policy effectiveness (Tindell and Bohlander 2012). Policies designed to minimize cyber-slacking are most effective when instructors enforce them and communicate policy rationales to students (e.g., Baker et al. 2012). For example, rather than simply including a “no cell phone” policy in the syllabus and verbally reprimanding students when they violate it, instructors should explain how the policy benefits student learning (e.g., greater attention, more complete notes, and higher achievement). Failure to provide justification might reduce policy credibility among students (Finn and Ledbetter 2013).

Research has identified several enforcement strategies that reduce cyber-slacking. For example, over 60% of college students surveyed by Berry and Westfall (2015) reported that they would be less likely to use a cell phone during class if they saw a classmate reprimanded (e.g., verbal warning) or punished (e.g., phone confiscation or grade reduction) for the behavior. Similarly, Baker et al. (2012) found that instructors and students viewed private verbal

Table 1 Instructor actions for combating cyber-slacking and where actions have effect

Action	Effect
1. Reject digital native myth and embrace instructor’s role in helping students minimize cyber-slacking.	Inside and outside the classroom
2. Improve student awareness of cyber-slacking by sharing research that demonstrates the negative impact cyber-slacking has on learning and achievement.	Inside and outside the classroom
3. Adopt, rationalize, and enforce technology policies to ward off classroom cyber-slacking.	Inside the classroom
4. Incentivize students to relinquish their mobile phones during class.	Inside the classroom
5. Incorporate active learning experiences such as small-group work, class discussions, and problem-based learning into lesson plans to keep students active and reduce boredom or passivity.	Inside the classroom
6. Use mobile technology as a teaching tool.	Inside the classroom
7. Teach students self-regulation strategies such as goal setting, behavior monitoring, time management, and environmental arrangement.	Inside and outside the classroom
8. Motivate students to delay gratification by connecting coursework to their goals and interests.	Outside the classroom

reprimands and grade reductions as effective strategies for combating cyber-slacking in the classroom.

Although instructors can reduce cyber-slacking in the classroom if inclined, some do not believe they are responsible for enforcing technology policies in their courses and instead adopt a *laissez-faire* approach to mobile technology classroom use (Finn and Ledbetter 2013). When college instructors were interviewed about their experiences teaching in classrooms where cyber-slacking occurs, most said they included and enforced syllabus policies designed to deter cyber-slacking, but others said they ignored cyber-slacking, believing their primary role was to deliver course content rather than dictate student behavior (Flanigan and Babchuk 2016). This latter group said that policing cyber-slacking impedes classroom instruction and that students must regulate mobile technology use themselves or pay the consequences with lower grades.

Although the viewpoint that college students should hold themselves accountable for on-task classroom behavior has merit, instructors should recognize that even the best-intentioned students struggle to overcome cyber-slacking temptations (Sana et al. 2013). Thus, although including and enforcing technology policies might run counter to one's teaching philosophy, such policies, rationales, and enforcements work to reduce student cyber-slacking.

Improve Student Awareness of Cyber-slacking Consequences

College students often overestimate their ability to multitask (Schlehofer et al. 2010), which can lead them to underestimate the negative impact that cyber-slacking has on their ability to pay attention in the classroom (e.g., Hammer et al. 2010). Oddly, college students believe that cyber-slacking is likely to distract their peers but do not believe that cyber-slacking impacts their own distractibility (e.g., McCoy 2013, 2016). This overconfidence suggests that many college students do not fully understand cyber-slacking's detrimental consequences. Providing students with a more realistic understanding of their multitasking inabilities and consequences should help them adhere to mobile technology policies. Such was the case when college students were briefed on cyber-slacking research findings and asked to relate those findings to their own experiences (Flanigan and Babchuk 2016). This consciousness-raising technique was effective for getting students to follow course policies against in-class mobile technology use.

Incentivize Students to Voluntarily Relinquish Mobile Devices

Asking students to voluntarily give up their mobile phones during class helps reduce classroom cyber-slacking (Katz and Lambert 2016). Students in an introductory-level psychology course could voluntarily turn off their mobile phones and place them in a designated classroom location at the start of every class period. For every class period that a student voluntarily gave up phone access, that student received extra credit. Participation in this activity during every class period boosted a student's final grade 3 percentage points. Students, on average, voluntarily submitted cell phones for 18 of the 30 class periods, which indicates that student participation in this voluntary activity was high. Students also described their experience positively. Ninety-five percent reported it was enjoyable. Sixty percent reported an improved classroom environment (e.g., better discussions). Sixty-eight percent reported increased ability to concentrate during class. Moreover, 98% indicated that they would recommend using this

activity in other courses. In summary, providing students with an incentive to relinquish their mobile phones during class is an effective way to combat classroom cyber-slacking.

Incorporate Active Classroom Learning

Cyber-slacking is linked with boredom (e.g., Emanuel 2013; McCoy 2016), and boredom stems from an unstimulating or unappealing environment (Mann and Robinson 2009). In a classroom, students often feel bored when expected to sit passively during lectures (Baker et al. 2012; Mann and Robinson 2009; Tindell and Bohlander 2012). In fact, college students have reported feeling bored approximately 50–60% of the time while attending lectures (Goetz and Hall 2014; Nett et al. 2011). To combat classroom boredom, college students often turn to their mobile devices to obtain stimulation (Pielot et al. 2015).

Meanwhile, students report that active classrooms reduce boredom and cyber-slacking desires (e.g., Baker et al. 2012; Flanigan and Babchuk 2015; McCoy 2016). Most college students (54%) believe that instructors would be “shocked” by the amount of cyber-slacking that occurs in non-interactive classrooms (Tindell and Bohlander 2012). However, active teaching practices such as class discussions, small-group work, debates, and problem-based activities decrease classroom cyber-slacking (e.g., Baker et al. 2012; Flanigan and Babchuk 2015; Tindell and Bohlander 2012) while simultaneously enhancing attention and learning (Dochy et al. 2003; Freeman et al. 2014; Meyers and Jones 1993).

Incorporate Mobile Technology as a Teaching Tool

Instead of focusing exclusively on ways to eliminate mobile phones and laptops from the classroom, instructors can also use mobile technology as a teaching tool. Instructors have two research-supported options for incorporating mobile technology. First, instructors can prompt students to use mobile phones and laptops in place of traditional handheld clickers to participate in classroom polling exercises (e.g., Imazeki 2014). Classroom polling platforms, such as PollEverywhere.com or Socrative.com, can solicit student opinions, administer quizzes, and invite student responses to questions posed during class. College students enjoy the interactive polling platforms and believe they enhance classroom learning (e.g., Shon and Smith 2011).

Second, instructors can prompt students to use mobile technology to look up information during class. Students in an environmental issues course were asked to look up information on new topics and share findings with classmates at the start of every class throughout a semester. At the end of the semester, students reported that using their phones or laptops to look up information at the start of each day’s lesson enhanced both course learning and enjoyment (Tessier 2013).

Although student use of mobile devices, to participate in classroom polls or look up information, can enhance classroom learning and enjoyment, Imazeki (2014) cautions that even the productive use of mobile devices during class might backfire because having mobile devices handy increases off-task temptation and behavior. Thus, instructors who use mobile technology as a teaching tool should set and enforce policies regarding appropriate and inappropriate use of mobile technology and be alert for potential cyber-slacking and intervene when necessary.

Teach Students to Self-regulate

The readily available nature of mobile technology places a nearly constant strain on college students' self-regulation as they struggle to avoid technology and to focus on learning course material (e.g., Aagaard 2015; Lepp et al. 2014; Taneja et al. 2015). This strain is probably most evident outside the classroom where students, left to their own volition, must stay on-task, and delay gratification from competing leisure alternatives to homework and studying (Bembenutty 2011). Although enforced course policies might alleviate the temptation to cyber-slack in the classroom, such policies have no direct influence on students' out-of-class behavior. Fortunately, instructors can train students to be self-regulated learners (e.g., McKeachie et al. 1985; Schunk and Zimmerman 1998; Wolters and Hoops 2015).

Self-regulation refers to the self-generated thoughts, feelings, and actions that guide goal attainment (Zimmerman 2000). Self-regulated learners “actively avoid behaviors and cognitions detrimental to academic success; they know the strategies necessary for learning to occur and understand when and how to utilize strategies that will increase perseverance and performance” (Mega et al. 2014, p. 122). Instructors who train students to use self-regulation strategies give students tools to overcome cyber-slacking temptations outside the classroom. Indeed, college students who use self-regulated learning strategies (e.g., self-testing, arranging an environment with minimal distractions) while doing schoolwork cyber-slack less than their peers who do not use self-regulation techniques (e.g., Wei et al. 2012). Teaching students how to (a) monitor attention, (b) arrange a study or homework environment that minimizes distractions, and (c) manage time are just a few ways that instructors can provide students with the self-regulation skills needed to overcome cyber-slacking temptation (Cohen 2012). For example, college students frequently use their mobile phones while studying or doing homework (Calderwood et al. 2014; Rosen et al. 2013), which adds considerable completion time (Bowman et al. 2010; Flanigan and Babchuk 2015). By training students to set time-management goals (e.g., “I will work for an hour before I take a break to check my phone”), instructors can minimize the impact that cyber-slacking has on students' homework and studying experiences.

Motivate Students to Delay Gratification from Mobile Technology

Effective self-regulation depends on delaying gratification. A student who strives to monitor and control attention but who cannot delay cell phone gratification will yield to that temptation and cyber-slack. According to Bembenutty and Karabenick (1998), academic delay of gratification refers to students' postponement of satisfying their leisure impulses—such as the desire to check Instagram or Snapchat—until an academic task is completed. While studying or doing homework, college students must often choose between staying on task or pursuing a more desirable leisure activity.

Fortunately, college instructors can motivate students to delay gratification. Students are more likely to delay gratification from leisure alternatives when they view coursework as instrumental for achieving personally meaningful goals (Bembenutty 1999). For example, students who perceive a homework assignment as valuable to their future goals are less likely to cyber-slack while doing the assignment than students who do not perceive the assignment as valuable to future goals (Xu 2015). More generally, gratification delay is positively associated with intrinsic motivation (Bembenutty 2008, 2009). By helping students find personal value,

interest, or goal attainment in their coursework, instructors can increase students' intrinsic motivation to delay gratification from mobile technology.

Conclusion

This article began by describing the cyber-slacking experiences of Eric, a college student pulled off-task by mobile technology while in class and while studying in the library. Dr. Sousa, his instructor, failed to ward off Eric's cyber-slacking despite using several well-intentioned strategies. The research reviewed in this article suggests that Eric and Dr. Sousa's experiences are common in higher education today. Mobile technology use has become second nature for most college students (Flanigan and Babchuk 2015; Roberts et al. 2014), and cyber-slacking has permeated college students' academic activities. Inside the classroom, cyber-slacking hinders student learning (e.g., Duncan et al. 2012; Kuznekoff et al. 2015; Ravizza et al. 2014), and instructors have struggled to minimize the problem (Berry and Westfall 2015; Tindell and Bohlander 2012). Outside the classroom, cyber-slacking diminishes work output and quality (e.g., Jacobsen and Forste 2011; Mokharti et al. 2015; Rosen et al. 2013). The myth that Net Generation students are digital natives who naturally leverage technology for their academic and professional betterment is dead (e.g., Switzer and Switzer 2013; Thompson 2013). Instead, Eric and other college students regularly cyber-slack, even though they suffer academically for doing so (Clayson and Haley 2013; Kuznekoff et al. 2015; Lepp et al. 2014).

Eight recommendations were provided to help college instructors confront and diminish cyber-slacking. First, instructors must acknowledge that the Net Generation is not predisposed to use technology for academically beneficial purposes. To the contrary, debilitating cyber-slacking activities are common among college students while in class (e.g., Emanuel 2013; Pettijohn et al. 2015) and while completing schoolwork outside of class (Jacobsen and Forste 2011; Mokharti et al. 2015). Second, instructors should incorporate technology policies in their syllabi, explain their rationales, and enforce them. Watching a classmate get reprimanded or punished for cyber-slacking reduces cyber-slacking in the classroom (e.g., Baker et al. 2012; Berry and Westfall 2015), especially when students understand the rationale for cyber-slacking policies (Finn and Ledbetter 2013). Third, instructors should make sure college students are aware of their multitasking limits and cyber-slacking's negative impact on learning. Although cyber-slacking negatively impacts student learning, many college students underestimate this consequence because they overestimate their ability to multitask (Schlehofer et al. 2010). Thus, college instructors must provide students with a more realistic understanding of their multitasking capabilities. Fourth, instructors should provide students with incentives (e.g., extra credit points) to voluntarily relinquish access to their mobile devices during class. Fifth, instructors should create active classroom experiences. Students have identified passive lectures as catalysts to cyber-slacking. Instead of relying on traditional practices such as lecturing, instructors should use active learning practices such as debates, small-group work, and problem-based learning to offset cyber-slacking temptations (e.g., Baker et al. 2012; Flanigan and Babchuk 2015). Sixth, instructors should turn mobile devices into instructional tools by asking students to respond to classroom polls or to look up lecture-relevant information on their mobile phones or laptops. Seventh, instructors should help students control cyber-slacking by teaching them to self-regulate (e.g., monitor attention, employ effective learning strategies, and plan time) as they learn (e.g., Wolters and Hoops 2015), particularly outside the classroom. Last, helping students connect coursework with their future goals and present

interests can provide the intrinsic motivation to delay gratification from mobile technology, particularly outside the classroom. By following these eight recommendations, instructors can help students combat cyber-slacking inside and outside the classroom.

References

- Aagaard, J. (2015). Drawn to distraction: A qualitative study of off-task use of educational technology. *Computers & Education, 87*, 90–97.
- Aguilar-Roca, N. M., Williams, A. E., & O'Dowd, D. K. (2012). The impact of laptop-free zones on student performance and attitudes in large lectures. *Computers & Education, 59*(4), 1300–1308.
- Aldridge, M., & DeLucia, R. (1989). Boredom: The academic plague of first year students. *Journal of the First-Year Experience & Students in Transition, 1*(2), 43–56.
- Atchley, P., Atwood, S., & Boulton, A. (2011). The choice to text and drive in younger drivers: Behavior may shape attitude. *Accident Analysis & Prevention, 43*(1), 134–142.
- Baker, W. M., Lusk, E. J., & Neuhauser, K. L. (2012). On the use of cell phones and other electronic devices in the classroom: Evidence from a survey of faculty and students. *Journal of Education for Business, 87*(5), 275–289.
- Bellur, S., Nowak, K. L., & Hull, K. S. (2015). Make it our time: In class multitaskers have lower academic performance. *Computers in Human Behavior, 53*, 63–70.
- Bembenutty, H. (2011). Academic delay of gratification and academic achievement. *New Directions for Teaching and Learning, 2011*(126), 55–65. doi:10.1002/d.444.
- Bembenutty, H. (2008). Academic delay of gratification and expectancy-value. *Personality and Individual Differences, 44*, 193–202.
- Bembenutty, H. (2009). Academic delay of gratification, self-regulation of learning, gender differences, and expectancy-value. *Personality and Individual Differences, 46*, 347–352.
- Bembenutty, H. (1999). Sustaining motivation and academic goals: The role of academic delay of gratification. *Learning and Individual Differences, 11*(3), 233–257.
- Bembenutty, H., & Karabenick, S. A. (1998). Academic delay of gratification. *Learning and Individual Differences, 10*(4), 329–346.
- Berry, M. J., & Westfall, A. (2015). Dial D for distraction: The making and breaking of cell phone policies in the college classroom. *College Teaching, 63*(2), 62–71.
- Bjornsen, C. A., & Archer, K. J. (2015). Relations between college students' cell phone use during class and grades. *Scholarship of Teaching and Learning in Psychology, 1*(4), 326–336.
- Boice, B. (1996). Classroom incivilities. *Research in Higher Education, 37*(4), 453–486.
- Bowman, L. L., Levine, L. E., Waite, B. M., & Gendron, M. (2010). Can students really multitask? An experimental study of instant messaging. *Computers & Education, 54*, 927–931.
- Calderwood, C., Ackerman, P. L., & Conklin, E. M. (2014). What else do college students “do” while studying? An investigation of multitasking. *Computers & Education, 75*, 19–29.
- Calderwood, C., Green, J. D., Joy-Gaba, J. A., & Moloney, J. M. (2016). Forecasting errors in student media multitasking during homework completion. *Computers & Education, 94*, 37–48.
- Clayson, D. E., & Haley, D. A. (2013). An introduction to multitasking and texting prevalence and impact on grades and GPA in marketing classes. *Journal of Marketing Education, 35*(1), 26–40.
- Cohen, M. (2012). The importance of self-regulation for college student learning. *College Student Journal, 46*(4), 892–902.
- Dietz, S., & Henrich, C. (2014). Texting as a distraction to learning in college students. *Computers in Human Behavior, 36*, 163–167.
- Dochy, F., Segers, M., Van den Bossche, P., & Gijbels, D. (2003). Effects of problem-based learning: A meta-analysis. *Learning and Instruction, 13*(5), 533–568.
- Dreikurs, R., Grunwald, B. B., & Pepper, F. C. (1971). *Maintaining sanity in the classroom: Illustrated teaching techniques*. New York: Harper & Row.
- Duncan, D. K., Hoekstra, A. R., & Wilcox, B. R. (2012). Digital devices, distraction, and student performance: Does in-class cell phone use reduce learning? *Astronomy Education Review, 11*(1), 1–4.
- Emanuel, R. C. (2013). The American college student cell phone survey. *College Student Journal, 47*(1), 75–81.
- Finn, A. N., & Ledbetter, A. M. (2013). Teacher power mediates the effects of technology policies on teacher credibility. *Communication Education, 62*(1), 26–47.
- Flanigan, A. E., & Babchuk, W. A. (2016). Cyber-slacking in the classroom: Comparing student and instructor experiences in the digital age. Paper presented at the 35th National Research-to-Practice Conference in Adult and Higher Education, Albuquerque, NM.

- Flanigan, A. E., & Babchuk, W. A. (2015). Social media as academic quicksand: A phenomenological study of student experiences in and out of the classroom. *Learning and Individual Differences, 44*, 40–45.
- Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014). Active learning increases student performance in science, engineering, and mathematics. In B. Alberts (Ed.), *Proceedings of the National Academy of Sciences* (pp. 8410–8415). San Francisco: National Academy of Sciences.
- Fried, C. B. (2008). In-class laptop use and its effects on student learning. *Computers & Education, 50*(3), 906–914.
- Gerow, J. E., Galluch, P. S., & Thatcher, J. B. (2010). To slack or not to slack: Internet usage in the classroom. *Journal of Information Technology Theory and Application, 11*(3), 5–23.
- Goetz, T., & Hall, N. C. (2014). Academic boredom. In R. Pekrun & L. Linnenbrink-Garcia (Eds.), *International handbook of emotions in education* (pp. 311–330). New York: Routledge.
- Griffiths, M. D. (2000). Does internet and computer “addiction” exist? Some case study evidence. *Cyberpsychology & Behavior, 3*(2), 211–218.
- Griffiths, M. D. (2012). Facebook addiction: concerns, criticism, and recommendations—a response to Andreassen and colleagues. *Psychological Reports, 110*(2), 518–520.
- Hammer, R., Ronen, M., Sharon, A., Lankry, T., Huberman, Y., & Zamstov, V. (2010). Mobile culture in college lectures: Instructors’ and students’ perspectives. *Interdisciplinary Journal of E-Learning & Learning Objects, 6*, 293–304.
- Harrison, M. A., & Gilmore, A. L. (2012). U txt WHEN? College students’ social contexts of text messaging. *The Social Science Journal, 49*(4), 513–518.
- Hill, L., Rybar, J., Styer, T., Fram, E., Merchant, G., & Eastman, A. (2015). Prevalence of and attitudes about distracted driving in college students. *Traffic Injury Prevention, 16*(4), 362–367.
- Howe, N., & Strauss, W. (2000). *Millennials rising: The next great generation*. New York: Vintage.
- Imazeki, J. (2014). Bring-your-own-device: Turning cell phones into forces for good. *The Journal of Economic Education, 45*(3), 240–250.
- Jacobsen, W. C., & Forste, R. (2011). The wired generation: Academic and social outcomes of electronic media use among university students. *Cyberpsychology, Behavior, and Social Networking, 14*(5), 275–280. doi:10.1089/cyber.2010.0135.
- Johnson, Z. D., Claus, C. J., Goldman, Z. W., & Sollitto, M. (2017). College student misbehaviors: An exploration of instructor perceptions. *Communication Education, 66*(1), 54–69.
- Junco, R. (2012). Too much face and not enough books: The relationship between multiple indices of Facebook use and academic performance. *Computers in Human Behavior, 28*(1), 187–198.
- Junco, R., & Cotten, S. R. (2012). No A 4 U: The relationship between multitasking and academic performance. *Computers & Education, 59*, 505–514.
- Katz, L., & Lambert, W. (2016). A happy and engaged class without cell phones? It’s easier than you think. *Teaching of Psychology, 43*(4), 340–345.
- Kornhauser, Z. G. C., Paul, A. L., & Siedlecki, K. L. (2016). An examination of students’ use of technology for non-academic purposes in the college classroom. *Journal of Teaching and Learning with Technology, 5*(1), 1–15.
- Kraushaar, J. M., & Novak, D. C. (2010). Examining the affects of student multitasking with laptops during the lecture. *Journal of Information Systems Education, 21*(2), 241–251.
- Kuznekoff, J. H., Munz, S., & Titsworth, S. (2015). Mobile phones in the classroom: Examining the effects of texting, twitter, and message content on student learning. *Communication Education, 64*(3), 344–365.
- Kuznekoff, J. H., & Titsworth, S. (2013). The impact of mobile phone usage on student learning. *Communication Education, 62*(3), 233–252.
- Langmia, K., & Glass, A. (2014). Coping with smart phone ‘distractions’ in a college classroom. *Teaching Journalism & Mass Communication, 4*(1), 13–23.
- Lawson, D., & Henderson, B. B. (2015). The costs of texting in the classroom. *College Teaching, 63*, 119–124.
- Lepp, A., Barkley, J. E., & Karpinski, A. C. (2015). The relationship between cell phone use and academic performance in a sample of US college students. *SAGE Open, 5*(1), 1–9.
- Lepp, A., Barkley, J. E., & Karpinski, A. C. (2014). The relationship between cell phone use, academic performance, anxiety, and satisfaction with life in college students. *Computers in Human Behavior, 31*(1), 343–350.
- Mann, S., & Robinson, A. (2009). Boredom in the lecture theatre: An investigation into the contributors, moderators and outcomes of boredom amongst university students. *British Educational Research Journal, 35*(2), 243–258.
- McCoy, B. R. (2013). Digital distractions in the classroom: Student classroom use of digital devices for non-class related purposes. *Journal of Media Education, 4*(4), 5–14.
- McCoy, B. R. (2016). Digital distractions in the classroom phase II: Student classroom use of digital devices for non-class related purposes. *Journal of Media Education, 7*(1), 5–32.

- McKeachie, W. J., Pintrich, P. R., & Lin, Y. G. (1985). Teaching learning strategies. *Educational Psychologist*, *20*(3), 153–160.
- Mega, C., Ronconi, L., & De Beni, R. (2014). What makes a good student? How emotions, self-regulated learning, and motivation contribute to academic achievement. *Journal of Educational Psychology*, *106*(1), 121–131.
- Meyers, C., & Jones, T. B. (1993). *Promoting active learning. Strategies for the college classroom*. San Francisco: Jossey-Bass Inc..
- Mokharti, K., Delello, J., & Reichard, C. (2015). Connected yet distracted: Multitasking among college students. *Journal of College Reading and Learning*, *45*(2), 164–180.
- Nett, U. E., Goetz, T., & Hall, N. C. (2011). Coping with boredom in school: An experience sampling perspective. *Contemporary Educational Psychology*, *36*(1), 49–59.
- Pettijohn, T. F., Frazier, E., Rieser, E., Vaughn, N., & Hupp-Wildsde, B. (2015). Classroom texting in college students. *College Student Journal*, *49*(4), 513–516.
- Pielot, M., Dingler, T., Pedro, J. S., & Oliver, N. (2015). When attention is not scarce-detecting boredom from mobile phone usage. In Proceedings of the 2015 ACM International Joint Conference on Pervasive and Ubiquitous Computing (pp. 825–836). ACM.
- Prensky, M. (2001a). Digital natives, digital immigrants. *On the Horizon*, *9*(5), 1–6.
- Ragan, E. D., Jennings, S. R., Massey, J. D., & Doolittle, P. E. (2014). Unregulated use of laptops in large lecture classes. *Computers & Education*, *78*, 78–86.
- Ravizza, S. M., Hambrick, D. Z., & Fenn, K. M. (2014). Non-academic internet use in the classroom is negatively related to classroom learning regardless of intellectual ability. *Computers & Education*, *78*, 109–114.
- Roberts, J., Yaya, L., & Manolis, C. (2014). The invisible addiction: Cell-phone activities and addiction among male and female college students. *Journal of Behavioral Addictions*, *3*(4), 254–265.
- Rosen, L. D., Carrier, L. M., & Cheever, N. A. (2013). Facebook and texting made me do it: Media-induced task-switching while studying. *Computers in Human Behavior*, *29*(3), 948–958.
- Sana, F., Weston, T., & Cepeda, N. J. (2013). Laptop multitasking hinders classroom learning for both users and nearby peers. *Computers & Education*, *62*, 24–31.
- Schlehofer, M. M., Thompson, S. C., Ting, S., Ostermann, S., Niernan, A., & Skenderian, J. (2010). Psychological predictors of college students' cell phone use while driving. *Accident Analysis & Prevention*, *42*(4), 1107–1112.
- Schunk, D. H., & Zimmerman, B. J. (Eds.). (1998). *Self-regulated learning: From teaching to self-reflective practice*. New York: Guilford Press.
- Shon, H., & Smith, L. (2011). A review of poll everywhere audience response system. *Journal of Technology in Human Services*, *29*(3), 236–245.
- Stebbins, R. (1971). The meaning of disorderly behavior: Teacher definitions of a classroom situation. *Sociology of Education*, *44*, 217–236.
- Switzer, J. S., & Switzer, R. V. (2013). The myth of the tech-savvy student: The role of media educators in a web 2.0 world. *Journal of Media Education*, *4*(4), 15–27.
- Svinicki, M. D., & McKeachie, W. J. (2014). *McKeachie's teaching tips: Strategies, research, and theory for college and university teachers* (14th ed.). Belmont: Wadsworth.
- Taneja, A., Fiore, V., & Fischer, B. (2015). Cyber-slacking in the classroom: Potential for digital distraction in the new age. *Computers & Education*, *82*, 141–151.
- Tapscott, D. (2008). *Grown up digital: How the net generation is changing your world*. New York: McGraw-Hill.
- Tapscott, D. (1998). *Growing up digital: The rise of the net generation*. New York: McGraw-Hill.
- Tessier, J. (2013). Student impressions of academic cell phone use in the classroom. *Journal of College Science Teaching*, *43*(1), 25–29.
- Thompson, P. (2013). The digital natives as learners: Technology use patterns and approaches to learning. *Computers & Education*, *65*, 12–33.
- Tindell, D. R., & Bohlander, R. W. (2012). The use and abuse of cell phones and text messaging in the classroom: A survey of college students. *College Teaching*, *60*(1), 1–9.
- Vitak, J., Crouse, J., & LaRose, R. (2011). Personal Internet use at work: Understanding cyberslacking. *Computers in Human Behavior*, *27*(5), 1751–1759.
- Wei, F. Y., Wang, Y. K., & Klausner, M. (2012). Rethinking college students' self-regulation and sustained attention: Does text messaging during class influence cognitive learning? *Communication Education*, *61*(3), 185–204.
- Wentworth, D. K., & Middleton, J. H. (2014). Technology use and academic performance. *Computers & Education*, *78*, 306–311.

- Wolters, C. A., & Hoops, L. D. (2015). Self-regulated learning interventions for motivationally disengaged college students. In T. Cleary (Ed.), *Self-regulated learning interventions with at-risk youth: Enhancing adaptability, performance, and well-being* (pp. 67–88). Washington DC: American Psychological Association.
- Xu, J. (2015). Investigating factors that influence conventional distraction and tech-related distraction in math homework. *Computers & Education, 81*, 304–314.
- Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 13–39). San Diego: Academic Press.