# Multitasking With Smartphones in the College Classroom

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### Abstract

Although the concept of multitasking itself is under debate, smartphones do enable users to divert attention from the task at hand to nongermane matters. As smartphone use becomes pervasive, extending into our classrooms, educators are concerned that they are becoming a major distraction. Does multitasking with smartphones impede learning? Can they be used to enhance learning instead? This article reviews current literature, provides suggestions for further investigation, and proposes an approach to incorporate smartphone multitasking in the classroom to enhance learning.

## Introduction

Smartphones and the multitasking they encourage are recent phenomena that have implications for student learning. Students receive texts, tweets, instant update notifications, and email on their smartphones throughout the day. Instant access often leads to multitasking without regard to the immediate environment or task at hand. Thus, students and their instructors have an interest in understanding how smartphone multitasking affects accomplishment of the main task in the primary learning environment. Since instructors have more (if not always complete) control of students' learning time and environment inside the classroom than they have of students' outside-class learning time or environments, developing opportunities where smartphones are tools to encourage learning may find more acceptance than attempts to ban phones from the classroom.

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## Literature Review

Multitasking occurs when tasks are divided and assigned to different regions of the brain to handle multiple thought processes (Shao & Shao, 2012). According to Bannister and Remenyi (2009), multitasking can be conscious or subconscious. They argued that subconscious multitasking is the type of multitasking commonly defined by society. Subconscious multitasking refers to the concept that a conscious mind can focus on only one task at a time, while the subconscious mind can accomplish a number of different tasks at one time.

Another aspect of multitasking involves whether the brain can switch tasks without any lag time. According to Dzubak (2012), multitasking requires time to switch from task to task. Though this time is minimal, it may help explain why some people seem to feel more productive while multitasking; the increased brain activity makes them feel like they have accomplished more. In reality, the time lost in switching from task to task may result in "inefficiency in brain function" (Jarmon, 2008, p. 33), though this inefficiency likely varies among individuals (Wiley & Jarosz, 2012). The majority of the switching occurs during the first of three brain phases—encoding (Naveh-Benjamin, Craik, Perretta, & Tonev, 2000). Recent research also suggests that one input is prioritized over another in order for the brain to execute a certain task (UC Santa Barbara, 2009). The use of texting (Bour, 2010) is one example. Thus, a student sitting in a lecture, while simultaneously reading and responding to a text, fails to absorb the lecture during the texting process. Without effective "self-monitoring strategies" (Jarmon, 2008, p. 35), multitasking impedes learning. Self-monitoring requires the individual to exercise internal restraint, such as deciding to put the phone away, rather than react to an external pressure, such as a professor checking for prohibited use of cell phones.

Due to major advancements in technology over the past few years, smartphones now function as a computer in the palm of the user's hand. According to Lee (2012), approximately 7% of all traffic on the web originates from mobile devices. However, Lee argues that by 2014 the majority of web traffic will come from these devices. This startling claim illustrates how dependent individuals are becoming on their mobile devices. Smartphones have been designed to make many activities easier and more efficient for their users, yet multitasking with a smartphone may actually decrease overall productivity due to the added number of inputs the brain must process (Dzubak, 2012).

The concept of subconscious and conscious multitasking is illustrated by texting while driving. The driver is initially focused on holding the wheel, noting relevant visual and aural clues, and keeping the car between the lines on the road. But when the driver begins to text, the conscious mind becomes focused on sending or receiving the text message, leaving the task of driving to the unconscious mind. Once a driver is not focused on the road, reaction time to adverse situations increases, as does the likelihood of an accident. The National Safety Council (2012) estimated that 24% of traffic accidents—over one million in 2010—involved drivers talking or texting on cell phones.

A similar disconnect can occur in the classroom when a student's focus is diverted to an incoming message on a smartphone and the information being shared in the classroom is lost. Students who are multitasking with smartphones during class often

are not paying conscious attention to the instructor or participating meaningfully in class discussion while using their phones. Robinson and Stubberud (2012) noted data from a 2009 study that reported that more than half of all university students had Internet-capable devices and that this number is rapidly climbing. The next generation of students will see this trend continue, if predictions that every elementary and high school student will be using a form of mobile learning device within five years (Norris, Hossain, & Soloway, 2011) are accurate. College educators should anticipate that students who use these devices at all stages of their early education will expect to use them at the collegiate level as well. Indeed, continual use may cause their users to assimilate material differently than many of their instructors did when they were in college (Watson & Ogle, 2013).

Multitasking may carry additional risks. Shellenbarger (2013) argued that multitasking hinders creativity. She stated that many individuals discover "aha" moments that can be applied to their jobs while exercising or relaxing away from their jobs; however, multitasking during these times requires the brain to work harder, reducing creativity, and thus should be avoided. This matters to business, and thus to business students, since innovative thinking is increasingly emphasized in business. Companies continue to seek creative minds that can develop products or services that can differentiate them from their competitors (Kim & Mauborgne, 2005).

Others argued that productivity may actually increase with multitasking, depending on the nature of tasks themselves (Wiley & Jarosz, 2012), as well as the electronic/technology tools available (Bannister & Remenyi, 2009). These differences will increasingly matter to educators as they prepare their students for different tasks with a variety of tools not previously available.

The increasing sophistication of smartphones has led to a new facet of multitasking as it relates to communication: multicommunicating, defined as "the practice of participating in two or more conversations using nearly synchronous media, such as face-to-face speech, telephone calls, videoconferencing, chat, and email" (Reinsch, Turner, & Tinsley, 2008, p. 392). Stephens (2012) pointed out the increasing prevalence of multicommunicating during meetings and suggested the need for better understanding of it. This capability is especially critical when it comes to tasks that require individuals to work in teams, as the increased levels of communication involved with multicommunicating increase the amount of risk that a message is not received in the manner that it was intended (Reinsch et al., 2008). Clearly, there is a need for better understanding of the effects of smartphone multitasking in our increasingly technology-enhanced learning and working environments. The discipline of law enforcement may focus on the distracted driver issue; however, educators are concerned with implications concerning the impact on learning, how smartphone multitasking affects how we communicate, and how such technology can facilitate the learning process.

Research indicates that loss in focus due to multitasking inhibits tasks as varied as driving (National Safety Council, 2012) to memorization (Abrams, 2013). Study of working memory capacity and problem solving shows that while analytic reasoning benefits from focused attention, more creative thinking could actually "be harmed by too much focus" (Wiley & Jarosz, 2012, p. 261).

## Input From Educators and Students

At a recent college teaching workshop that considered use of technology in the classroom, many present lamented the widespread cell phone use by students in their classrooms. They reported that students persist in using their phones despite class rules against them, particularly in classes with large enrollment. Some instructors have resorted to requiring students to turn in their cell phones at the beginning of class and retrieve them at the end—admittedly not a practical solution.

What if students were allowed access to their phones? When students in one classroom were told they could freely access their smartphones, most did so. During later discussion, several students volunteered that they sometimes were more distracted than they thought they would be under these conditions, both by their own phone activity and by the phone activity around them. One student noted that she found she was less successful at blocking out distractions than she had expected. This belief that people can "block out" outside distractions is one that should be pursued in further research, as proving otherwise might persuade students to eliminate distractions rather than rely on attempts to block them out. In addition, studies into student perception and actuality concerning the ability to focus on a task while taking repeated random breaks to multitask with their smartphones may provide data that would be useful in bringing perception and actuality closer together.

Another noteworthy verbal comment came from a student who referred to the number of texts she received. She volunteered that if we had conducted this exercise at the beginning of the semester before her friends knew her class schedule, she would have received many more messages.

## Taking Advantage of Smartphones in the Classroom

Setting a balance between multitasking and mono-tasking is a vital step toward overcoming a potential drop off in production due to distractions created by multitasking. Unless instructors successfully ban all phones, they run the risk of phones being in use and having a detrimental effect during classes. Since banning them may prove impractical if not impossible in the long run, instructors can take the opposite approach: They can create ways to make smartphone usage contribute to the learning environment. As noted by Watson and Ogle (2013), the key will be "sound pedagogy and instructional design" (p. 5) that will appropriately enable the hands-on learning that is relevant to the total learning experience. Particularly in a "flipped classroom" where the reading and learning of material is done by students before class time and class time is used for application, exercises, and what used to be called homework, smartphones can be effectively used to carry out these activities. While the number of students who have laptops or tablets is increasing, virtually every business college student has a smartphone. Thus, they can access information to apply to in-class exercises such as those described below. For each sample exercise, prereading or instruction is given, followed by the in-class activity that includes student use of their smartphones.

| Before Class | During Class (Students Investigate Then Give Results) |
|---|---|
| **1. Topic: *Corporate Communication* (*Role of Communication*)** | |
| Read a case on a company | Ascertain what happened after case was written (e.g., change in stock price, executives, or legal status) and how communication was a factor |
| **2. Topic: *Communicating Ethics*** | |
| Read about ethics | Check online versions of *Wall Street Journal, New York Times* for ethics issues and how companies are communicating on these issues; make recommendations, providing rationale from prereading |
| **3. Topic: *Crisis Communication*** | |
| Read about crisis | Find examples from the news of a firm in crisis and recommend internal and external communication steps |
| **4. Topic: *Corporate Communication* (*Image, Sustainability, Web Presence*)** | |
| Read about sustainability | Given a pair of companies in an industry, student teams check websites to determine commitment to sustainability and make recommendations to improve how companies use their websites to show their commitment to this issue |
| **5. Topic: *Communication With the Media*** | |
| Read media coverage of issue | Compare how companies use (and are treated by) media, including both traditional and social media |
| **6. Topic: *Cross-Cultural Communication*** | |
| Read about global issues | Check differences in global, multinational, and regional companies including their communication practices with stakeholders, media, and governments; draw conclusions |

In each of these scenarios, students read assigned material before coming to class. The investigation described above is then carried out during class, using smartphones, although tablets or laptops could also be used. Depending on complexity, number of students, and time constraints, students present findings in oral presentations (with or without PPT or similar technology), Think-On-Your-Feet commentary, full-class discussions, brief written executive summaries or memos, or extensive executive reports. These activities can be done in one class or spread over several. Additionally, they can be individual activities, paired, or team activities.

## Conclusion and Suggestions for Research

Although the literature indicates that there are many ways to define multitasking, most research suggests that as the brain receives more inputs, or demands to multitask, there are more potential risks for individuals to fail to complete the tasks at hand with a high degree of proficiency (Dzubak, 2012; Jarmon, 2008; UC Santa Barbara, 2009). An exception may be when creative thinking is called for (Bannister & Remenyi, 2009; Wiley & Jarosz, 2012). The small but growing body of research involving multitasking with smartphones reflects their increasing presence in both

classroom (Robinson & Stubberud, 2012) and business (Reinsch et al., 2008). Some effects are positive, as when employees in the field or working in virtual teams stay connected and conduct research with their smartphones. However, employees' use of smartphones to connect to people outside of the office for nonwork reasons is an example of multitasking that creates the perception that employees are focused on their main task at hand, when in reality they are focused on what is being sent from or received by their smartphones. This is analogous to students' texting with friends outside of class while appearing to participate in the learning process inside the classroom. Research cited suggests that both productivity in the workplace and learning in the classroom are affected, although not all effects are negative. More research is needed to measure these effects.

As indicated by Dzubak (2012), Jarmon (2008), and others, students alternating their attention between the reading material and their texting likely impede their comprehension of the material. Research that considers demographic information about students' use of multitasking-enabling devices such as smartphones, tablets, and laptops throughout the day would provide better context for understanding their use of these devices in the classroom. Monitoring the relationship between multitasking with a smartphone and productivity will be crucial for companies and educators as they develop policies regarding smartphone usage during work or school hours. Business interest in this area may offer possibilities for funded research as well as independent research.

Finally, further research into students' accuracy in analytic thinking and productivity in creative thinking, while multitasking with smartphones, could lead to reasonable recommendations concerning when to discourage and when to encourage such multitasking in the classroom. This message could be reinforced by the judicious use of smartphones in the classroom environment in activities that enhance the learning experience. More pedagogical investigation in this area can lead to a much richer involvement of smartphones that will encourage rather than inhibit student learning.

## Declaration of Conflicting Interests

## Funding

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