The Relationship between Nomophobia and Classroom Learning: How Fear of Being without Cellphones Affects the Youth Population in a Digital Age

Jessica Mendoza, the University of Alabama at Tuscaloosa, Tuscaloosa, AL 35487, US, Seungyeon Lee, PhD, the University of Arkansas at Monticello, Monticello, AR 71656, US & Ian M. McDonough, PhD, the University of Alabama at Tulscaloosa, Tuscaloosa, AL 35487, US

Keywords: Cellphone use, mobile technology, nomophobia, online learning

Abstract

Research has shown that many youths feel anxiety or discomfort when losing access to their mobile devices (King, Valença, Silva, Baczynski, Carvalho, & Nardi, 2013: 140-144; Sharma, Sharma, Sharma, & Wavare, 2015: 705-707). Perhaps some of them feel as if they were not able to communicate with their loved ones or like they lost connectedness to the world around them. It is also possible that they feel as if they are giving up the convenience of accessing information. These feelings are all related to "the fear of being out of mobile phone contact" –which is referred to as no mobile phone phobia or *nomophobia* for short (Elmore, 2014; SecurEnvoy, 2012; Sharma et al., 2015: 705-707; Yildirim & Correia, 2015: 130-137). This recent phenomenon has come about in the age of technology. In today's modern society, many adolescents and young adults are tied to their phones. With a phone that has access to the internet, the world is literally at one's fingertips. This phenomenon has brought many positive benefits such as getting closely connected to people despite physical distances, acquiring knowledge in a timely manner, etc. At the same time, the rising use of mobile devices and technology can negatively affect people's daily lives. In *Psychology Today*, the author noted that 66% of people suffer from nomophobia and more than 50% do not turn off their cellphones, which can be considered an internet addiction (Elmore, 2014). This article reviews how cellphone usage has influenced the classroom environment in terms of learning, memory, and attention capacities of adolescents and young adults in college. Here we address the following questions: How has technology impacted student learning and educational policy across curricula? Is the use of a cellphone in class always detrimental? Should cellphones be permitted in the classroom? How can students prevent forgetting information that is presented to them

in lectures in the presence of cellphones? The discussions of this study are crucial for educators and practitioners in higher education.

Introduction

Cellphones grew popular to the public in the late 90s. They were primarily a way to stay connected to friends, family, and co-workers via use of voice-calls and voice-mails. Later, communications shifted to text messaging (replacing pagers or beepers). In the early 2000s, cellphones developed new features such as touchscreens and rear/front-end cameras. Presently, cellphones have evolved into "smartphones" and come with applications that turn one's device into a tiny portable computer. The applications that can be installed are seemingly endless and often help increase productivity in everyday activities (e.g., GoogleMaps, Facebook, Twitter, Amazon, Gmail, Google Search, etc.). With mobile technology, online learning is a rising trend in educators and students. These digital tools have made life easier in a multitude of ways, but it is often questionable whether people are suffering from some unfavorable consequences because of their attachment to their mobile devices. This poses a critical issue as to how individuals' dependency on technology is not only shaping human behavior but also human cognitive processes.

How has cellphone usage impacted learning in a digital age?

As cellphones have evolved, so has our need to rely on these tiny smart devices. A survey conducted by the Pew Research Center has found that 83% of Americans who use the internet do so on a mobile device and 89% of internet users log on daily while 31% report using the internet almost constantly (Perrin & Jiang, 2018). Students are notorious for accessing their phones to seek information online. Sometimes this information seeking can take place at the least opportune time. From an instructor's standpoint, it can be challenging to keep students captivated when their attention is absorbed in their phones. However, the cost of cellphone distractibility in the classroom is more detrimental for the student than the lecturer because the student is responsible for earning a decent grade in the course. One study showed that students' inability to multitask between social media distraction and academic work resulted in poor academic performance (Marone, Thakkar, Suliman, O'Neill, & Doubleday, 2017). Their finding also indicated that the excessive use of social media during the classroom lecture adversely affects the comprehension of visual information.

Though research has found that phone use in the classroom leads to disengagement, distractions, and lower GPA (e.g., Adnan & Gezgin, 2016: 141-158; Froese, Carpenter, Inman, Schooley, Barnes, Brecht, & Chacon, 2012: 323-332; Lee, Kim, McDonough, Mendoza, & Kim,

2017; Mendoza, Pody, Lee, Kim, & McDonough, 2018: 52-60; Thornton, Faires, Robbins, & Rollins, 2014: 479-488), students continue to view phones in a positive light (Jan, Ullah, Ali, & Khan, 2016: 674-681). Empirical evidence approximates that 30% of information is lost when students are note-taking while texting during a lecture (Froese et al., 2012). Further research supports that a ringing phone in class is disruptive to not just the individual receiving the call but to others who hear the ringing as well. Notifications (even when on vibrate mode) have also been found to be disruptive to individuals and lowers their performance on tests for lecture content (Lee et al., 2017). One study has found that the mere presence of a cellphone (even if it is not the individual's phone) reduces attention (Thornton et al., 2014). Despite the evidence that supports the drawbacks of having a phone in class, students continuously use their cellphones in the classroom because they prefer not to sacrifice the advantages of mobile technology (Mehdipour, & Zerehkafi, 2013). While it cannot be said that all college students feel positive towards technology, research has demonstrated that students who are familiar with cellphones and tablets feel more positive about such devices than those who have no ownership of these devices (Al-Erman, Elsherif, Shaalan, 2016: 93-102).

Is the social dependency on cellphones positive or negative?

The answer can be varied as there are many individual differences to consider. For example, personality traits, behavioral differences (using a phone to shop online, catch up on social media versus to search for information to enhance one's knowledge) towards phone use, importance of course content to the student, level of difficulty to understand concepts in class, and the extent to which they are anxious when they lack access to their mobile device, etc. Many of these individual differences might also interact with one another, thus complicating the relationship between the use of technology and individuals' daily habits, behaviors, and their learning outcomes. However, what researchers know now is that individuals today are more anxious when their phone is out of sight, akin to many addictions (Cheever, Rosen, Carrier, & Chavez, 2014: 290-297; King et al., 2013; Sherma et al., 2015).

Notwithstanding the fact that increasing use of technology is adversely affecting many individuals, we cannot deny that having cellphones in the classroom might also provide some benefits. Studies have shown that college students feel that being able to use their phone to seek out external information to supplement their understanding of course content enhances their learning experience (Carbeil & Valdes-Corveil, 2007: 53-58; Jan et al., 2016; Wang, Shen, Novak, & Pan, 2009: 673-695). Research has found that, in some cases, cellphones can be helpful in self-directed learning (Mehdipour & Zerehkafi, 2013: 93-101; Rashid & Ashgar, 2016: 604-612). Cellphones have also been found to be useful to distribute foreign language material to students and can be especially useful for students who have low verbal and visual abilities

(Chen, Hsieh, & Kinshuk, 2008: 93-113; Kiernan & Aizawa, 2004: 71-84; Thornton & Houser, 2005: 217-228; Wang et al., 2009). These studies provide hope that cellphones might still be able to be used as novel teaching strategies, especially for online learning settings.

The use of mobile technology and classroom management: Should cellphones be permitted or banned in the classroom?

The conflicting findings leaves educators and its related professionals baffled at what sort of policy to employ in the classroom. Should educators totally ban the use of cellphones in class? Do students who have their cellphones in class perform worse? Do cellphones divert attention to the lecture material? To investigate the issue further, a group of researchers sought to test the impact of four cell phone policies on classroom learning (Lee et al., 2017). The policies were: cellphone use allowed, cellphone possession allowed but *without* usage, cellphones removed, and a control condition where no instructions were given. Participants watched a 20-minute lecture and were sent text messages throughout the lecture to mirror classroom distractions. After the lecture, participants completed a short test on the lecture content. Findings revealed that those who had their phones taken away did better on the test than those who kept their phones. All the groups who kept their cellphone, regardless of classroom policy performed equally poorly. This research suggests that students may be better off without having access to their cellphones in class. However, could time be a factor of when individuals may begin to experience distraction in a lecture?

To explore these questions further, researchers replicated the study methodology of the previous study, but also investigated the distractibility of text messages and individual differences in nomophobia (Mendoza et al., 2018). Additionally, researchers closely investigated whether students would become more distracted as the lecture progressed as it was related to nomophobia. Researchers examined four quarters of a 20-minute lecture video while text messages were sent to participants during the lecture. Findings demonstrated that those who had possession of their cellphone performed worse on the exam and as their level of nomophobia increased. Because research has shown that attention tends to wane 10 minutes into the lecture, researchers theorized that this time point may also be when students begin to feel anxious from being away from their cellphones. Consistent with these ideas, the trend was most notable during the third quarter of the lecture (about 10 minutes into the lecture). This is consistent with prior research on the presence of anxiety linked to mobile device dependency and with research on how cellphones are distracting in classroom environments (Cheever et al., 2014; Froese et al.,2012; Thornton et al., 2014).

Conclusion

Many questions remain unanswered that might ultimately help educators decide whether to permit or ban cellphones in the classroom. What is the lecture topic on? What is the difficulty level of the content? Will cellphone use be directed only towards classroom activities or will students be distracted by non-classroom activities? This problem is daunting because looking at a cellphone—even if turned off—serves as a powerful distractor from classroom learning. Still, there is no doubt that mobile technology is a pivotal part of today's young adults. We remain optimistic that, under certain circumstances, being constantly connected can be good in that individuals can quickly access information to supplement their learning experience. However, in settings where undivided attention is essential, it can be deleterious.

Educators should review the benefits and limitations of cellphone use in the classroom and decide if using such mobile devices could be beneficial to enhancing students' learning experience. Some modern instructional activities take advantage of social media or collective knowledge and require a mobile device in class. For example, using a cellphone in place of a clicker to gain class participation might turn a distracting device into a learning tool. Critically, this example illustrates the difference between drawing attention toward one's cellphone in the service of a learning activity rather than social media, email, or other non-learning context. Likewise, permitting cellphones might depend on whether a traditional lecture setting is used or whether modern online settings are used. If the class is more fitted for a traditional lecture setting, then perhaps it would be valuable to inform students how cellphones in class can impair their attention, learning, and memory for the class content. By internally motivating students to remove their cellphones, they might remember that checking notifications is a choice rather than a necessity. By self-choosing not to use their cellphones, perhaps the effects of nomophobia will be reduced and attention will be optimized.

References

Adan, M. & Gezgin, D. M,. 2016. 'A Modern Phobia: Prevalence of Nomophobia among College Students'. In: *Journal of Faculty of Educational Sciences*. 49(1), 141-158.

Al-Emran, M., Elsherif, H. M. & Shaalan, K., 2016. 'Investigating Attitudes Towards the Use of Mobile Learning in Higher Education'. In: *Computers in Human Behavior*, 56, 93-102.

Cheever, N. A., Rosen, L. D., Carrier, L. M. & Chavez, A., 2014. 'Out of Sight is Not Out of Mind: The Impact of Restricting Wireless Mobile Device Use on Anxiety Levels Among Low, Moderate and High Users'. In: *Computers in Human Behavior*, 37, 290-297.

Chen, N. S., Hsieh, S. W. & Kinshuk, A., 2008. 'Effects of Short-Term Memory and Content Representation Type on Mobile Language Learning'. In: *Language Learning & Technology*. 12(3), pp. 93-113.

Corbeil, J. R. & Valdes-Corbeil, M. E., 2007. 'Are You Ready for Mobile Learning?'. In: *Educause Quarterly*. Retrieved from: https://er.educause.edu/articles/2007/4/are-you-ready-for-mobile-learning pp. 53-68.

Elmore, T., 2014. 'Nomophobia: A Rising Trend in Students.' In: Psychology Today, Retrieved from: https://www.psychologytoday.com/us/blog/artificial-maturity/201409/nomophobia-rising-trend-in-students

Froese, A. D., Carpenter, C. N., Inman, D. A., Schooley, J. R., Barnes, R. B., Brecht, P. W. & Chacon, J. D., 2012. 'Effects of Classroom Cell Phone Use on Expected and Actual Learning'. In: *College Student Journal*, 46(2), 323-332.

Jan, S. R., Ullah, F., Ali, H., & Khan, F. 2016. 'Enhanced and Effective Learning Through Mobile Learning an Insight into Students Perception of Mobile Learning at University Level'. In: *International Journal of Scientific Research in Science, Engineering and Technology* (IJSRSET), 2(2), 674-681.

Kiernan, P. J. & Aizawa, K., 2004. 'Cell Phones in Task Based Learning: Are Cell Phones Useful Language Learning Tools?' In: *ReCALL*, 16(1), 71-84. https://doi.org/10.1017/S0958344004000618

King, A. L. S., Valença, A. M., Silva, A. C., O., Bacynski, T., Carvalho, M. R. & Nardi, A. E., 2013. 'Nomophobia: Dependency on Virtual Environments or Social Phobia?' In: *Computers in Human Behavior*, 29(1), 140-144.

Lee, S., Kim, M. W., McDonough, I. M., Mendoza, J. S. & Kim, M. S., 2017. 'The Effects of Cellphone Use and Emotion-Regulation Style on College Students' Learning'. In: *Applied Cognitive Psychology*. https://doi.org/10.1002/acp.3323

Marone, J. R., Thakkar, S. C., Suliman, N., O'Neill, S. I. & Doubleday, A. F., 2017. 'Social Media Interruption Affects the Acquisition of Visually, not Aurally, Acquired Information during A Pathophysiology Lecture'. In: *Advances Physiology Education*. https://doi.org/10/1152.advan.00097.2017

Mehdipour, Y. & Zerehkafi, H., 2013. 'Mobile learning for education: Benefits and Challenges'. In: *International Journal of Computational Engineering Research*, 3(6), 93-101.

Mendoza, J. S., Pody, B. C., Lee, S., Kim, M. & McDonough, I. M., 2018. 'The Effect of Cellphones on Attention and Learning: The Influences of Time, Distraction, and Nomophobia'. In: *Computers in Human Behavior*, 86, 52-60.

Perrin and Jiang, 2018, March. 'About a Quarter of U.S. Adults Say They Are "Almost Constantly" Online'. Retrieved from: http://www.pewresearch.org/fact-tank/2018/03/14/about-a-quarter-of-americans-report-going-online-almost-constantly/

Rashid, T. & Asghar, H. M., 2016. 'Technology Use, Self-Directed Learning, Student Engagement and Academic Performance: Examining the Interrelations'. In: *Computers in*

Human Behavior, 63, 604-612. https://doi.org/10.1016/j.chb.2016.05.084.

SecurEnvoy, 2012. '66% of the Population Suffer from Nomophobia the Fear Of Being Without Their Phone'. Retrieved from: http://www.securenvoy.com/blog/2012/02/16/66-of-the-population-suffer-from-nomophobia-the-fear-of-being-without-their-phone/

Sharma, N., Sharma, P., Sharma, N. & Wavare, R. R., 2015. 'Rising Concern of Nomophobia Amongst Indian Medical Students'. In: *International Journal of Research in Medical Studies*, 3(3), 705-707.

Thornton, P. & Houser, C., 2005. 'Using mobile phones in English education in Japan'. In: *Journal of Computer Assisted Learning*, 21, 217-228. https://doi.org/10.1111/j.1365-2729.2005.00129.x

Thornton, B., Faires, A., Robbins, M. & Rollins, E., 2014. 'The Mere Presence of a Cell Phone May Be Distracting'. In: *Social Psychology*. 45(6), 479-488. https://doi.org/10.1027/1864-9335/a000216

Wang, M., Shen, M., Novak, D. & Pan, X., 2009. 'The Impact of Mobile Learning on Students' Learning Behaviours and Performance: Report from a Large Blended Classroom'. In: *British Journal of Educational Technology*, 40(4), 673-695. https://doi.org/10.1111/j.1467-8535.2008.00846.x

Yildirim, C. & Correia, A. P., 2015. 'Exploring the Dimensions of Nomophobia: Development and Validation of a Self-Reported Questionnaire'. In: *Computers in Human Behavior*, 49, 130-137.