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LOSING THE BATTLE: Student and Instructor Perspectives on Attention Loss in the Classroom

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ABSTRACT

Because Information and Communication Technologies (ICT) provide many advantages, such as increasing effectiveness and efficiency, they are becoming extremely common in the classroom. However, alongside these advantages, ICTs have also become a big distraction for many students, thus causing students to use ICTs to slack. Through surveying students and interviewing instructors, we examined two different points of view on whether the presence of ICT causes student's to lose their attention in the class. We found that the presence of ICTs does have a negative effect on student's attention, and this loss of attention occurs most often during PowerPoint lectures. We conclude with practical implication and suggestions for remedying slacking in the classroom.

Keywords

Information and communication technology, attention, classroom, slacking, ICT use

INTRODUCTION

Information and communication technologies (ICT) have become a common part of everyday life. One setting in which ICTs have widely diffused is the classroom. Many college campuses offer wireless technology for students, encouraging them to use those technologies to follow along with classroom lectures, while also utilizing the access of ICT to broaden their knowledge on classroom topics. Through PowerPoint, many professors place entire lectures on the web for students to access at their leisure. This upswing of ICT usage on campuses has been welcomed. However, professors are starting to see signs that this technology may not be as encouraging as first considered. Instant access to the World Wide Web can have several drawbacks, as many students can do many other things besides pay attention to lectures. Because of ICTs, this lack of attention in classrooms may outweigh its apparent benefits.

Slacking, due to the presence of ICT in the classroom, has already become an issue discussed by many college professors. For example, Sherry Colb, a Law Professor at Rutgers Law School, noticed a recent trend in her classroom in that many of her students had become less attentive and more inclined to asking questions like "what?" and "can you repeat that?" when called on to answer questions (Colb, 2006). She also noticed that her students were less equipped to handle complex ideas than in the past. After having someone come in and observe her classroom she was able to determine why. At the end of the lecture the analyst told her that her class had a low rate of web-surfing compared to what he had observed in other classes, but this low rate was still about forty percent (Colb, 2006)[1].

Situations, like Colb's, are becoming increasingly common, and therefore it is important to consider whether ICT has a place in the classroom. On the one hand, students that have laptops in classrooms may be doing everything besides taking notes and paying attention, especially since the professor cannot see what is on student's screens. The lack of attention corresponds to slacking, which includes activities such as checking emails, chatting online, sending text messages with mobile devices, and

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[1] Since then, she also remarked that she has put a ban on laptop use in her classroom. She said that when she initially started the laptop ban, students expressed that they were discontent. Professor Colb is quoted saying that "I have already noticed a higher level of reasoning, after only two weeks of class under the virtual laptop ban, and I am optimistic that student performance throughout the semester will improve as well" (Colb, 2006).

spending time on non-class related websites. On the other hand, we can argue that laptops have the capability to increase efficiency in note taking i.e., people can type much faster than they can write, thereby ICTs enable students to document more of what the professor is saying. It is also much easier to organize and access notes on a laptop than shuffling around hand written documents. However, these benefits of ICTs have been disputed by critics saying that ICTs create a barrier between the student, the class, and lecturer by encouraging students to take verbatim notes rather than listening and writing down the most significant material (Dorf, 2006). For example, students who take their notes on a laptop are tempted to simply treat their notes as a "one-stop-shop" outline, but students who have handwritten notes, case notes, and other materials can refine them later into a concise outline that is more helpful in understanding the class material. Because of these reasons, we conclude that ICT usage in the classroom needs to be evaluated more closely.

Because of the impact on students' attention, many professors have begun to take action against maladaptive ICT usage. However, because the diffusion of ICT is quite recent, there have been different attitudes toward what steps should be taken in regards to their use in classrooms. Some professors have rules in place against cell phone and Internet use in class, while others encourage ICT presence as a mechanism to promote learning. For example, a law professor from the University of Memphis recently banned the use of laptops in her classroom. She did not understand the great amount of attention she received from local news outlets after making the move stating, "During [the] brouhaha about the matter, I heard from law professors at Harvard, University of Pennsylvania, University of Texas, Widener, and Pace who have also banned laptops for much the same reasons. One had done so three years ago"(Young 2006). There have been no universal standards set and many professors are pushing for school administrations to take action and determine what kind of ICTs should be allowed in classroom settings. For any type of concrete ruling in favor or against new technology presence, it must first be determined if ICT is a hindrance to learning. This leads us to ask the question, *is the presence of information and communication technology in classrooms having a negative affect on student attention?*

THEORY AND LITERATURE REVIEW

Figure 1 presents the research model which suggests that ICT usage in the classroom is causing a loss of attention in the classroom activities. However, there are many variables to factor in when analyzing the correlation between attention in the classroom and the use of ICT. The bulk of the research comes from technology usage, slacking, attention, and distraction. These variables have many different interpretations. Thus, to better understand their relationship to the research, we first define them and contextualize their meaning in the classroom environment.
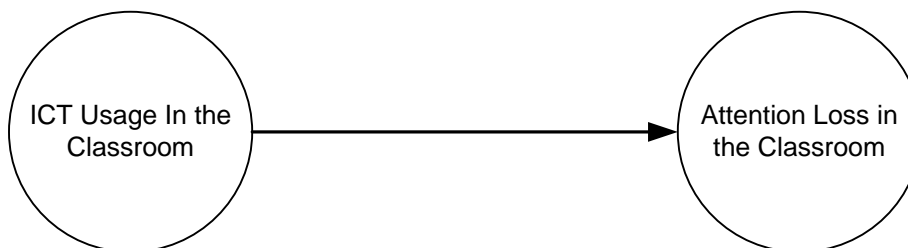
Figure 1: Research Model

ICT use is growing exponentially, not only in the classroom, but around the world as well. ICT is an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning. ICTs are often spoken of in a particular context, such as ICTs in education, health care, or libraries. With regards to the classroom our study mainly focuses on laptops, cellular phones, and other mobile devices that can easily be transported to and from the classroom. ICT presence in the classroom is increasing exponentially all over the world so there must be a way to manage it in a positive way (Lim, 2003). For example, some studies have shown that schools with low socioeconomic status have students that tend to not use ICT in the classroom properly (Hohlfeld, 2008). These ICTs can be utilized by having class lists with updates and reminders for students about upcoming projects, assignments, and homework. These are all incredible sources for information which, if used properly, can really help aid in the learning process.

Off-task behaviors with ICT in the classroom have been largely attributed to the increased use of laptops, the rise in the amount of wireless networks being set up in buildings with classrooms, and the percentage of students that have their cell phones with them in class. There has been much debate as to whether this technology promotes or hinders student's ability to learn and pay attention. There are quite a few off-task activities that students use their ICT for including e-mail, instant messaging friends and family, playing games, text messaging, constantly checking the time, the list goes on and on.

Attention is important to learning because learning is most proficient when a person is paying attention. William James, a famous psychologist wrote in his book **Principles of Psychology** (1890): *Everyone knows what attention is, it is taking possession by the mind in clear and vivid form, of one out of what seem several simultaneously possible objects or trains of thought...It implies withdrawal from some things in order to deal effectively with others, and is a condition which has a real opposite in the confused, dazed, scatterbrained state.* We define attention as the ability to focus selectively on a selected stimulus, sustaining that focus and shifting it at will; the ability to concentrate (Webster's Dictionary, 2004). Attention loss occurs when the mind is distracted, internally or externally (Damrad-Frye & Laird, 1989; Fisher 1998). A distraction refers to stirring up or confusing with conflicting emotions or motives (Webster's Dictionary, 2004). For instance, students can be distracted by their peers in the classroom looking at flashy websites or cellular phones going off. Similarly, professors can be distracted by the fact that people are not paying attention to their lecture and become less motivated to teach to the best of their ability. A lack of attention points towards slacking. Specifically, slacking has been looked at as not using due diligence, care, or dispatch. Slacking can also comprise of lacking in completeness, finish, or perfection (Webster's Dictionary, 2006). Slacking through ICT refers to the acts students perform on their ICTs when they are not paying attention. Therefore, slacking directly corresponds to not paying attention through ICTs and thus inhibits performance.

METHOD

In this section we test our research model and present the results of our study. First, we provide descriptive statistics of our student sample and explain the severity of their maladaptive usage of ICTs in the classroom. We also determine which classroom activity slacking most predominantly takes place. Then, we test our research model using regression analysis. Finally, we present the qualitative results of the interviews.

Descriptive Statistics

To explore the negative affect ICT has on student's attention in the classroom, we collected responses from students and instructors at a large university in the southeastern United States. First, we anonymously surveyed 190 undergraduate students. Then, we interviewed instructors and provided them with the option for anonymity.

Demographically, 68% of our students were males and 99% were Caucasian. Seniors comprised 42.1% of our participants with junior classmen ranking second with 23.6%. The majority of the participants surveyed had a GPA of 3.0 or higher (66.9%). Only 1.1% had a cumulative GPA less than 2.0 average (See Table 1).

Do you take your cell phone to class?	Never 0.5% (1)	A little 0.0% (0)	Sometimes 1.1% (2)	A lot 3.2% (6)	Always 95.2% (180)

	Mean	Standard Deviation
How many of your courses require you to bring a laptop?	1.32	1.55
How many of your courses at Clemson do you to bring a laptop to?	2.63	1.91

Gender		Male 68%		Female 32%
Class Status	Freshman (19.7%)	Sophomore (14.6%)	Junior (23.6%)	Senior (42.1%)
Overall GPA	<2.0 1.1%	2.0 and <2.5 4.5%	2.5 and <3.0 27.5%	3.0 and >3.5 39.9%	3.5 or greater 27.0%

Table 1: Demographics

Our focus at the beginning of the survey was to explore the actual presence of ICT in the classroom. It was discovered that 99.5% of those surveyed bring their laptops to class and 95% bring cellular phones. Realizing that almost all students have these two ICTs at their disposal in the classroom makes it understandable that 46.5% of the students surveyed frequently use them to slack in class. We tested what classroom activities student most often slack during. Our study revealed that the activity in which slacking occurs most often is the lecture (both PowerPoint and traditional styles). Specifically, 63.68% of students use ICTs to slack during PowerPoint lectures and 51.40% use them to slack during traditional lectures (See Table 2).

Facebook, a popular virtual social network, and text messaging, sending a written message from one cellular phone to another, are the mediums through which ICTs are used most frequently to slack. Of those surveyed, 87% of students admitted

to using Facebook periodically during class[2]. When asked about using Facebook during class one student remarked, "It [Facebook] is addicting and more interesting than class work." Facebook in the classroom is a problem because as another student remarked, "When using Facebook in class I do not pay attention." One hundred and seventy-three out of one hundred and eighty-eight students that responded acknowledged that they use text messaging during class[3]. Students proclaimed that text messaging while in class occurs mostly because they are "bored" and they "desire to stay connected [to friends]." The consensus from most students surveyed was that Facebook and text messaging are very popular means of slacking during class because they are discreet and not disruptive.

PowerPoint Lecture	63.68%
Traditional Lecture	51.40%
Individual Assignments	29.47%
Large Group Exercises	14.74%
Paired Exercises	8.42%

Table 2: Maladaptive ICT Usage by Class Activity in Percentages

After analyzing the presence of ICTs in the classroom, we shifted our focus to how ICTs affect a student's attention to class material. Of those surveyed, 75.1% believe that it is healthy to pay attention to the class material yet, 30.4% said that they let ICTs negatively interfere with their attention to the course. Survey responses help us explore these results further. Even though many people think it is healthy to pay close attention in class, many respondents indicated that they pay attention in important classes and slack on days that do not require their full attention. Students also admitted that ICTs provide significantly more entertainment than a professor's sometimes uninteresting lecture.

Statistical Results

Next, we used regression to analyze the relationship between ICT usage and attention loss in the classroom. Items for ICT usage were adapted from Agarwal and Prasad (1997) measure of IT usage: *I use ICTs...a lot in class, whenever possible in class, frequently in class*. We also added questions regarding ICT use including: *How often do you use your cell phone during class?* and *How often do you use your laptop in class for non-academic purposes?* To measure attention loss, we adapted measures from Pennebaker (1995) to the ICT/classroom context. Items included *I don't pay attention to the course, I don't usually care much about the course, I feel it is usually a waste of time to think about the course, I don't think its work paying attention to course, I let the ICTs interfere with the course, I feel it is important to block out the course to preserve your sanity,* and *I do not think about the course.*

After confirming the reliability and convergent validity of the factors, statistical analysis confirmed our hypothesis that the amount use ICT in the classroom significantly distract from their attention to class material (See Figure 2). Specifically for every one unit increase in using ICTs in the classroom, student's attention to the classroom activities was distracted by .272 (p-value significant at .001). ICT usage explains 27.5% of the variance in attention[4]. We calculated an f^2 was used to assess the strength of our model's ability to predict attention loss a f^2 was calculated as follows: $f^2 = R^2 / (1-R^2)$. Generally, an f^2 effect sizes of .02, .15, and .35 are considered small, medium, and large (Cohen, 1988). Based on our calculation, our model explains a large amount of information (0.379).

Finally, we also controlled for GPA of students, their class status, and their gender. Surprisingly, we found that none of the variables significantly contributed to attention loss in the classroom.

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[2] The survey also contained a section where the students rated the extent they use many instant messengers during class, including Facebook, AOL, MSN, Google, and Other (where they could fill in the messenger they use during class). This question was followed by 2 qualitative questions: 1) *What are the top two behaviors you do while using ICT in class? Explain why you choose to do these behaviors.* and 2) *How does having access to ICTs affect your ability to pay attention to class?*

[3] 2 students did not respond to this question.

[4] The figure shows 31.1% because it includes the marginal added explained variance from the control variables.
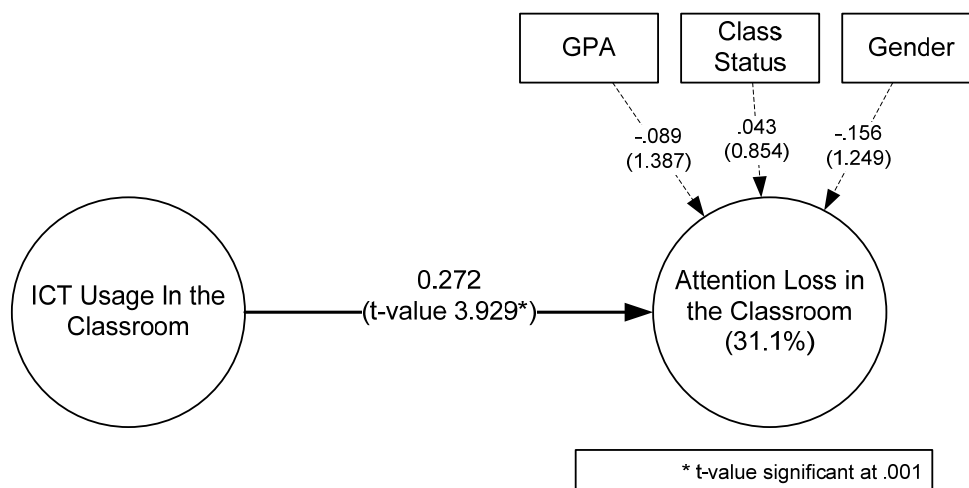
Figure 2: Results Model

Interview Results

For the second data collection technique, we interviewed eight professors about their experience and opinions regarding the usage of ICTs in the classroom. We came to three conclusions. First, we found that student's use of ICTs in the classroom affects the way some professors view them. "…if they are using a laptop during class and are not providing me with the appropriate body language and eye contact, I am going to assume that they are not engaged in what is going on and that my opinion of them as a student is going to be negative." While professors realize some students are using ICTs correctly in class, they also realize the majority is using them to slack off. A professor of biology acknowledges this fact by saying, "There are some [students] that use them [ICTs] correctly and they are helpful…but I am confident that many of them are just off in another world, and as a result their grades suffer…"

Second, most all interviewed agreed that ICTs are distracting and lead to lower grades for students. For instance, a professor of history has seen the affect of slacking on student's grades. "With very few exceptions, it is the weak students who screw around [on their cell phones and laptops and] who are getting D's and F's." He does not punish these students but his attitude is, "I am not going to extend them much help…I can't help everyone and I'll pick the ones who are trying." While we do not condone the avoidance of the "slacking" students, we do agree that in every class you have students that appear to be most difficult to teach without enforcing proper intervention techniques.

Finally, all professors interviewed were more than aware of the presence of ICT in their classroom and that this presence has led many professors to make more of an effort to keep students engaged during class time. When asked what they do to capture student's attention in the classroom, one professor of entrepreneurship and leadership, replied, "I believed in active learning whereby the students are actively engaged in the classroom." This professor often circulates the room to make sure all students are on task because he believes that "ICTs adversely affect students attention and thereby their performance". We agree that active learning is key to student engagement, and that by engaging students, professors are minimizing students inherent nature to slack.

DISCUSSION AND CONCLUSION

Based on surveys results and professor interviews, the hypothesis that the presence of ICT negatively affects students' attention in the classroom was found to be significant. As the modern industrialized world continues to advance technologically, the presence of ICTs in the classroom is going to continue to grow. Accepting this, professors must account for it when teaching and students must strive to give their professors their undivided attention when it is expected.

In order to capture a student's attention for a full class period, instructors should consider some of the following approaches and points. The results of the survey show that professors should refrain from using PowerPoint and traditional oral lecturing as the main tool for educating pupils because they cause students to lose attention the quickest. If this type of activity is necessary, professors need to learn how to manage students' attention by breaking up this activity with more cognitively engaging activities. Suggestions for remedying this include more group exercises, more class activities, more teacher – student interaction, optional attendance to class, and surveys that solicit student opinions on teaching the subject matter most effectively. However, it is apparent that some distraction and slacking is unavoidable. As one student commented, "I make

good grades so I do not feel I need to stop slacking during class." Notwithstanding, students have an equal responsibility to refrain from slacking and not become distracted.

As the use of ICT becomes more common in everyday use, it is inevitable that these technologies will continue to become intertwined in classroom activities. Our research has proven that students do slack in the classroom because ICTs accelerate their want to do so. In the future, the usefulness of technology will be determined by how professors and students work together to correct for this problem. We believe it is impractical to remove ICTs from the classroom altogether, thus working together is key to have ICTs as a positive tool for classroom use. Ultimately, school administrations must make a decision on whether these technologies are important to class activities, and more formally implement how to minimize damage while still promoting learning. As technology continues to change and offer new possibilities for instructors and students alike, it is how these technologies are *used* that will decide upon their overall effectiveness.

REFERENCES

1. Agarwal, R. and J. Prasad (1997) The role of innovation characteristics and perceived voluntariness in the acceptance of information technologies. *Decision Sciences,* 25, 3, 557-582.

2. Cohen, J. (1988) Statistical Power Analysis for the Behavioral Sciences (2nd ed.). Hillsdale, NJ.

3. Colb, S. F. (2006, September 5). *Taking Notes Without a Computer: How Laptops Distract from Classroom Learning*. Retrieved November 18, 2008, from FindLaw: http://writ.news.findlaw.com/colb/20060906.html.

4. Damrad-Frye, R., & Laird, J. D. (1989) The experience of boredom: The role of self-perception of attention. *Journal of Personality and Social Psychology*, 57, 315-320.

5. Dorf, M. (2006, November 29). *Laptops in the Classroom*. Retrieved November 22, 2008, from Dorf on Law: http://michaeldorf.org/2006/11/laptops-in-the-classroom.html.

6. Fisher, C. D. (1998) Effects of external and internal interruptions on boredom at work: two studies. *Journal of Organizational Behavior*, 19, 5, 503-522.

7. Hohlfeld, T. N. (2008) Examining the digital divide in K-12 public schools: Four-year trends for supporting ICT literacy in Florida. *Computers & Education*, 1648-1663.

8. Lim, C. P. (2003). Creating a Conducive Learning Environment for the Effective Integration of ICT: Classroom Management Issues. *Journal of Interactive Learning Research*, 405-423.

9. Pennebaker, J.W. (1995) Emotional Attention, Clarity, and Repair: Exploring Emotional Intelligence Using the Trait Meta-Mood Scale, in Emotion, Disclosure, and Health., Eds. Salovey, P., Mayer, J. D., Lee Goldman, S., Turvey, C. and Palfai, T. P. Psychological Association: Washington, D.C.

10. Webster's Dictionary. (2004, June 12). *Definition of Attention*. Retrieved November 17, 2008, from Medicine Net: http://www.medterms.com/script/main/art.asp?articlekey=7133.

11. Webster's Dictionary. (2006, February 4). *Definition of Slack*. Retrieved November 17, 2008, from Merriam-Webster's Online Dictionary: http://www.merriam-webster.com/dictionary/Slack.

12. Young, Jeffery R. (June 2, 2006). *The Fight for Classroom Attention.* The Chronicles of Higher Education. Retrieved November 13, 2008, from http://chronicle.com/free/v52/i39/39a02701.htm.