

Behind the Laptops in a Large Lecture

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Abstract: In the spring of 2009 a large lecture class, CEE 2814 Measurements, was observed to determine student laptop activity during lecture. This 185 student section met three times per week in a large lecture hall for 43 total classes in the semester. All students were required to own a laptop. For 26 of these lectures a graduate student sat in various locations throughout the room and recorded the students' participation levels during the class. The purpose of this study is to observe how students interact with the lecture during class and what distractions were presented with the use of laptops. Among other conclusions, it was found that computers caused more distractions than all other distractions combined, and 34% of the students brought a computer to class and 86% used them for purposes other than class related. It was further found that the majority of all distractions were computer related. Results suggest that laptop computers are not an overall effective tool in a large classroom environment.

Background

Observing any college campus today, a person can easily see the impact of laptops on students' study habits. Many take their laptops with them to all their classes and are encouraged to use them for note taking. It is safe to assume that utilization of personal computers has been fully integrated into college academia during the past fifteen years. In the mid-1990s, college universities began requiring all students to purchase laptops recognizing the potential personal computers had to increase the efficacy of a student's study and class time. Initially, it appeared that the results were positive. According to L.D. Fink, R.L. Kolar, and D.A. Sabatini, an experiment conducted at Oklahoma University in 1998 and 1999 for a junior level water resources course yielded favorable results for laptop usage as an aid to class participation. As described in the article, the students enrolled in this course were split into two sections, one that required the use of laptops and one that did not. The authors found that "class dynamics were consistently better in the laptop section, which is reflected in the much higher class participation score". Perhaps the most important conclusion was in the abstract of the article which stated "Evaluations do clearly show that, when the technology is used properly and when class time is not spent resolving technical problems, the laptop students had a more positive learning experience."

However, David Cole of Georgetown University had a different point of view concerning the use of laptops in his lecture class. Cole asked his law students to answer an anonymous survey asking whether or not they believe laptops were a useful tool in the classroom. As stated in his article "[a]bout 80 percent reported that they are more engaged in classroom discussion when they are laptop free." Additionally, "95 percent admitted that they use their laptops in class for "purposes other than taking notes, such as surfing the web, checking e-mail, instant messaging and the like." Cole also made reference to an article written by Carrie Fried. According to Fried, the results she obtained from observing a General Psychology course taught at Winona State University, "the more students used their laptops in class, the lower their class performance." Additionally, a survey answered by the students for this class "indicate that laptop use by fellow students was the single most reported distraction [...] accounting for 64% of all responses."

Due to the different opinions concerning the effects of laptops in the classroom, a study was conducted in order to determine how students were using personal computers in the Spring 2009 CEE 2814 Measurements course at Virginia Tech. For a number of years Virginia Tech has required that all incoming freshman engineers purchase a tablet and many students bring their laptops to class in order to take notes electronically. The study's primary objective was to observe and record whether or not students used their laptops for classroom purposes.

Methods and Results

Ten random students were observed throughout each observed class. If a student was engaged in distracted activities two or three times during a class that student was considered distracted for the class. See Table 1.

Table 1. Sample Daily Data Collection Table

	Student 1	Student 2
Beginning:	Taking notes on laptop	Listening to lecture
Middle:	Surfing web on laptop	Taking notes in notebook
End:	Playing game on laptop	Listening to lecture

Figure 1 shows that about one third of all students used a computer during lecture, and of those computer users, the large majority were distracted. About one third of all students were distracted, and of those distracted students, the majority were using a computer.

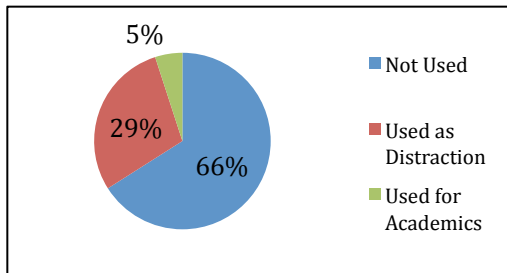


Figure 1. Student use of computers..

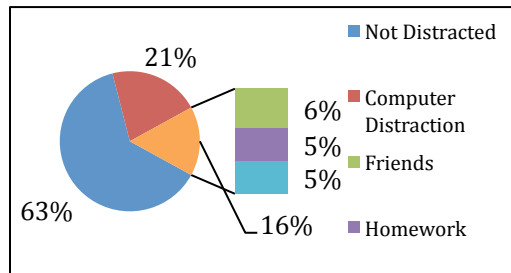


Figure 2. Student distraction by type

Conclusion

From the results, laptop use during the class distracted students from lecture more often than it assisted with note taking or other academic activities. Larger lectures appear to experience more problems with this issue than smaller classes. The CEE Measurements class had a total student count of 185 students while the General Psychology course observed in Fried’s article had 137 students. In both cases, results showed laptops hindered student participation. Conversely, Fink’s article had a total student count of 11 and 12 and yielded positive responses for laptop use. The key appears to be the ability for the instructor to interact with individual students during a lecture where laptops are used. In large lectures there are no clear answers, short of banning or introducing more technology, to the distractions involved with laptops.

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hierarchical links and connections between branches of those hierarchies. The validity and reliability of some of these measures, including the Novak and Gowin score, are discussed in the literature (McClure, Sonak et al. 1999).

Kinchin and Hay provide insights into the meaning of the structure of the concept maps (Kinchin, Hay et al. 2000). Chains, or nodes linked in sequence one after another, was an indication of rote memorization. Spoke, or tree structures, showed a better understanding but one that is fairly rigid and is lacking connections. Nets, or nodes linked into a web, indicate a much more developed understanding and adjust well to changes. This can be used not only to see if a student knows if there is a relationship between two concepts but also to get an idea of how well they understand those relationships (see Figures 1 & 2 for an example of a spoke and a net structure).

Methodology

For this experiment, the students were divided into three groups. Two groups were given exercises as part of the experiment and the third was used as a control. Early in the semester, the students were given a brief (10-15 minute) introduction to concept mapping and asked to create a single concept map about their knowledge of three high-level Computer Science concepts. This provided a base line understanding for the data analysis. The students were asked to update their maps after the first two study interventions (about halfway through the semester) and after the fourth and last study assignment near the end of the semester. Changes between versions of the maps were viewed as changes in understanding over time (Marchand, d'Ivernois et al. 2002). The concept maps were scored using the Novak and Gowin scheme and weighted on how their structure matched those identified by Kinchin and Hay. These values were analyzed using a MANOVA with repeated measures over time. The experimental group was used as a factor in the analysis. Other measures used included a multiple-choice test on the concepts and the students' grades.

Results and Discussion

One of the lessons learned from this study came from comparing the results obtained by the measures used. Examining the concept maps qualitatively, there was clear evidence where students understood concepts, where they misunderstood concepts, and where they did not understand the concepts at all. This was apparent from how they explained the relationships, what relationships they used, and what concepts they did or did not use. The data analysis of the quantitative data from the maps reflected this and was effective in showing changes over time and between groups. This approach provided the level of detail needed for the study.

The finding with the concept maps did not correspond well with the other measures. The students' grades and the multiple-choice test did not provide much useful data. The grades tended to be grouped together and the test data has a very large statistical variation. Neither of which made them effective at measuring the concepts being studied.

In this study, concept maps proved to be a useful measure of learning. They provided a look at the learning of abstract concepts by having the students explicitly describe their understanding and this drew out important data that may not have been observed otherwise. This is a tool that can be used to complement other evaluation methods.

Acknowledgements

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Negotiating Sexuality and Spirituality in the College Classroom: Facilitating Student Learning Through Knowledge and Narrative

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Abstract: An academic environment provides a developmental context for informing and challenging students' most deeply rooted and private beliefs—the intersection of sexuality and spirituality. The scientific study of sex, from an interdisciplinary, global perspective, is designed to increase students' knowledge but is also likely to question lessons learned at home and from religious institutions. We conducted a qualitative analysis of 95 written narratives from undergraduate students regarding how their study of sexuality has challenged, informed, or strengthened their own family background and spiritual beliefs. Results indicated that most students, while raised with traditional religious training (e.g., Catholic, conservative Christian), currently described themselves as spiritual (not religious), questioning their faith (not devout), and more accepting (less condemning) of diverse sexual practices (e.g., premarital sex, homosexuality, contraception). Even for students who chose traditional sexual mores for themselves (e.g., virginity; being in love before initiating a sexual relationship), most reported that learning about the great variation in human sexual experience in diverse cultures and religions worldwide helped them to expand their earlier ideas about intimate relationships, procreation, and sexual behavior in and out of marriage.

Background

Two controversial subjects in the academic environment are sexuality and spirituality. Student dialogue on sex and religion is especially difficult because it requires self-exploration (McCarty, 2009). Both sexuality and spirituality are deemed inherently private and under the control of the family. Indeed, children learn most of their sexual information from parents. As they transition from adolescence to emerging adulthood, youth are inundated with new information from academic, peer, and media sources (Arnett, 2000). Although society is saturated with explicit sexual messages, adults are reticent to provide accurate sex education in homes and schools (Irvine, 2004; Russell, 2005), fueling a cultural tension between sexual exploitation and repression. This tension makes youth especially vulnerable to sexual risk taking and unprepared for making responsible decisions about healthy sexuality (Allen, Husser, Stone, & Jordal, 2008). A college course on human sexuality provides an opportunity for students to gain new knowledge and to fill in the gaps created by educational silences on the subject. At the same time, a sexuality course may cause dissonance and confusion, because religious teaching can be restrictive in its views that sex should be preserved for procreation and marriage. In addition to conveying scientific study about human sexuality, there is a practical reality about a college course on human sexuality: it may be a student's first opportunity to learn about and/or assess knowledge that is also practical for responsible adult behavior. To investigate these issues, this study was guided by the two research questions: (a) How do college students describe their family and religious backgrounds? (b) How has the study of sexuality challenged or strengthened their views?

Methodology

The data consisted of 95 (67 female, 28 male) first person narratives written by students of diverse backgrounds, religions, and ethnicities in an undergraduate global issues human sexuality course at a large research university. As a core curriculum course, students from every college on campus were enrolled, including majors in agriculture, architecture, business, education, engineering, human sciences, physical and life sciences. Enrollment averaged 160 students per class. Permission to conduct the study was granted by the university Institutional Review Board. The aim of the course was to examine the diversity of human sexuality using global perspectives from interdisciplinary sources, including biological, developmental, historical, psychological, and sociological approaches. Given the large lecture format, several learning assignments were used, such as multiple-choice exams, homework quizzes, and daily exit slips where students shared reflective responses. The study of human sexuality provides an opportunity for students to join personal and academic interests. To give students an opportunity to express insights about past and present experiences, we developed an extra credit assignment. Students could select a topic from among several posed by the instructors (e.g., sex education; jealousy in relationships; gender identity; sex and alcohol use on campus). Writing the extra credit paper was strictly voluntary, and students' views were not graded. Students submitted their paper to a teaching assistant, who recorded the extra credit points. A research assistant removed all

identifying information to prepare them for analysis. For this study, students responded to the following topic: *Based on our study of sex in other cultures and throughout history, how are your religious or spiritual views being informed, challenged, and/or strengthened? How do the issues we are learning about in class relate to your family background? What kinds of contradictions and ambivalences are you facing as a result of this course?*

Data Analysis and Results

The narrative approach allowed participants to give voice to their own experiences, and to explain how they make meaning of their knowledge on a controversial topic. Using qualitative analysis, we generated a coding scheme that reflected respondents' perceptions, as well as our integration of key themes (Bogdan & Biklen, 2007). Considering religious affiliation while growing up, the vast majority of participants claimed a Christian and/or Catholic. A few participants identified themselves as Hindu, Islamic, or Jewish. Only 10% indicated that they were raised without a religious affiliation. A common finding among all sample members was that they had a traditional religious upbringing in which parents "rarely discussed sex." A young woman stated: "When I told my parents I was taking a class on human sexuality, they asked me why I was doing such a thing. In my family, sex is very taboo and shouldn't be discussed as freely as we do in class. This class is allowing me to break free of those boundaries and discuss something that is a natural, human action without the fear of being judged, looked down upon, or shunned."

Now at college, most students reported that despite being raised in a traditional home, emerging adulthood led to a "struggle between religion and sexuality." As a 19-year-old male wrote, "I was born and raised Catholic. I was forced to go to church every Sunday. Now that I am free from my parents' tyranny, I have made the decision to go to church on my own accord. But I have this eternal struggle day in and day out between being a modern Christian in a sexually liberated society." Often, students found resolution for this struggle through new knowledge gained in class, knowledge that helped them understand that sex was "not a casual thing, but intricate and complicated." Another male student indicated, "I was raised in a Protestant Christian household. I went to church weekly, and I made a commitment to learn what my religion was all about. I struggled through hard questions and eventually came to the conclusion that I would devote myself to God. Since coming to college, I have been able to maintain my beliefs to protect my virginity until marriage. This class has opened my eyes to the wide world of sexuality. I have gained a new appreciation for the complex and incredible nature of sex." Only rare students found the course content completely at odds with their own convictions, as one man explained: "I am a Christian, and I believe that sex is meant for a male and female during marriage. All this talk in class about sex with multiple partners and promiscuous women is outrageous. Although I have found this class has helped me to see the points of view that others may have, I stand strong in my faith and rebel against anyone speaking differently."

Discussion and Conclusion

Sexuality and spirituality engage students' most deeply held beliefs. Their views about these controversial topics can be both challenged and informed in an academic setting. We combined pedagogy and research to further understand the complexity of this subject, finding that the majority of our students were invested in learning about the history and diversity of sexuality, over time and across cultures. Further, students reported the value of using that knowledge to inform them intellectually and personally, thus meeting the goals of the class and of our pedagogy.

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