Laptops and PowerPoint: Teacher education for the senses or sensibilities?

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In this article the authors explore the findings of their qualitative case study of a laptop focused teacher education program from a critical perspective. While examining student criticisms and concerns regarding their use of the technology in their classrooms and official curriculum as expressed in surveys, individual and focus group interviews, the authors argue for the benefits of unrestricted use of laptops with internet access in classrooms in aid of open source learning and substantive resistance to official curriculum.

Introduction

This article has undergone deep revision since we first outlined it shortly after the collection and initial analysis of our data. During the time between the conclusion of our data collection, initial interpretation and article outline, both authors' appreciation for the possibilities for computer, digital, and internet related technologies to transform and extend classroom learning grew. While we remain concerned about the potential for laptops in the teacher education classroom to constrain community dialogue, we have gained new appreciation for their affordance of opportunities for students to subvert externally planned learning, in aid of self-determined learning though the open-source nature of internet based resources. In creative response to the challenges we faced teaching in a teacher education compulsory laptop program, we have striven to find ways to use the technology to engage students, and enrich their learning and community classroom experience. Since the initial analysis of our study our pedagogy has been changed and we believe improved by our technological adaptation. At present we collectively use blogs, YouTube, podcasting, and social networking sites to engage with our students and extend their learning outside the classroom, and beyond the official curriculum. We are living examples of how fast technology can transform the pedagogy and curriculum of educators open to change and risk taking.

In this study we ask critical questions in order to trouble some of the taken for granted notions and practices surrounding the current use of laptop centered teacher education programs. We believe the emerging

findings of our study may challenge many of the stated and widely accepted rationales endorsing open-ended laptop use in teacher education programs. After our first phenomenological analysis of the data we argued that the technology was a distracter and that the students were less focused on the lessons at hand as a result. Admittedly, we underestimated the power of the technology for extending learning through time and space and possibly overestimated the importance of what was going on in the lessons that other instructors and ourselves were disseminating. We did not have enough respect for the students' assessments of what they needed to learn and whether they needed to pay attention, and we did not understand the potential of the technologies for engaging and connecting students and extending learning. We now understand more clearly that by having the technology in the classroom the students were empowered to continue their own learning by escaping into the rich world of digital information that the laptop technology portals. We also have learned from firsthand experience the power that new media and digital technology possess as tools for creating community outside of scheduled hours and set places, and for facilitating the transition of students from consumers of information to local producers of knowledge that can be shared globally.

The overarching question driving this study from its onset has been the questions of whether or not laptop-focused B.Ed programs are just another technological flash in the pan. Are they just one of the many "revolutionary instructional technologies" (Stoll, 1995) that have been widely touted as capable of transforming teaching and learning; like the filmstrip, overhead projector, calculator, and television? We are also concerned that the popular usage of computer technology in education may in the end be more analogous to the ubiquitous, historic and continuing attempts at devising curriculum-in-a-box approaches that end up scripting and controlling teachers and students. While we acknowledge the potential of new technologies to extend and enhance student learning in and out of class, we are mindful of the possibility for these technologies to become forms of control, distortion, and surveillance (Galloway, 2004). We can't help but be concerned that a uncritical, misguided optimism directed towards computer technology in teacher preparation, along with the approach of technizising teaching that we believe accompanied it in the program we studied, seems founded upon the false idea that we can replace bad teachers and pedagogy with good technology (Oppenheimer, 2003; Stoll, 1995). We are not trying to praise or blame technology as the solution or the problem, but have come to understand how technology can be useful if those who are using it

have the freedom, trust and respect to play with it as they see fit. For example, as high school teachers the authors recall how they were expected to police and limit the students' creativity with computers by ensuring that they used them only as prescribed by the focus of the lesson, using prescribed software. So while students were creatively and imaginatively resisting the prescribed lesson and extending their computer use beyond what they were told to do, the authors were expected to prevent them from doing so, and by preventing them from doing so we may have been preventing powerful learning that the students had been internally motivated to pursue. Gatto (2008) calls this "open-source learning": "Open-source learning accepts that everything under the sun might be a possible starting point on the road to self-mastery and the good life" (p. 31).

The mass media seems inundated with studies that are trying to position computer technology and new media as dangerous tools. Recent research in the UK regarding use of email by academics and the resulting changes in their work and effects on their intelligence, has suggested that emailing reduces IQ at a level greater than that experienced by individuals who have just completed smoking one marijuana joint (Menzies & Newsome, 2005). In a recent Toronto Star research article, Heather Menzies and York University sociologist Janice Newsome interviewed 100 academics at six Canadian universities regarding the changes to their teaching and learning resulting from the widespread introduction of technology in education. Almost without exception they believe that the multitasking involved in technology use, and the frequency and nature of email communications, have "dumbed down" themselves and their universities, by limiting discourse as a result of changing the format of discussion from in-depth and thoughtful to instantaneous and broad. The academics in the Menzies and Newsome study reported a reductionist effect of technology, a domination of "senses" over critical sensibilities in scholarship and academic discourse. Are the same effects being felt in B.Ed programs by students and their instructors? What are core qualities of a meaningful and catalytic teacher training curriculum? Can we teach to both the senses and sensibilities of students in a compulsory laptop focused teacher education program?

Recall that when writing was first introduced, Plato urged his fellow citizens to avoid this new technology. He feared that the new technology would result in memory being atrophied because people would rely on writing. To put this in a modern context, rather than remembering what to buy at the grocery store we would write it all down and the result would be that we would no longer need our

memory and so it would atrophy. Do laptops in the teacher education classroom atrophy student social and critical thinking skills? Are we concerned, in the same way as Plato was, about an inevitable transition to new ways of communicating, thinking and knowing and telling? Plato was concerned with the effects of writing on both memory and vocal muscle. We too are concerned with the possible effects of laptop computers on thinking, speaking, and doing in teacher education and k-12 classrooms. On one hand, we now see that laptop computers may actually be opening new learning opportunities in the classroom, by offering students who are disengaged by compulsory curriculum and pedagogy new possibilities for creative and substantive resistance in the classroom. On the other hand, to what extent are these students missing out on the experience of full hands on and minds on experiences in the classroom? As educators who teach against the grain for the purpose of emanicipatory education, we believe in the power and possibility of community-based education. Our pedagogy is deeply rooted in community talk. While we recognize silence can speak loudly and can be a form of active participation, we question our students' ability to be in the here and now during community dialogic inquiry, if they are networking and messaging online, or viewing an online video site.

As instructors in a laptop program we took different approaches to the regulation and surveillance of laptop use in the classroom. Price rationalized his strict control of when laptop could be opened in his classroom during community discussion, with Freire's distinction between authority and authoritarianism in the democratic classroom in mind (Freire, 1997). Ricci, consistent with belief in freedom of choice and open learning, gave his adult students freedom to choose when to use their laptops.

Speaking of her son and others who "speak digital as a mother tongue," Robinson (2009) writes:

When my son, James, was doing homework for school, he would have five or six windows open on his computer, Instant Messenger was flashing continuously, his cell phone was constantly ringing, and he was downloading music and watching the TV over his shoulder. I don't know if he was doing any homework, but he was running an empire as far as I could see, so I really didn't care. (p. 18)

We believe that Robinson's attitude is the correct one to take and that we need to respect and trust students to develop their own curriculum.

Many observers, unlike Robinson, make fearful statements like the following:

The vast majority (around 70 per cent) reported that they no longer read as deeply and reflectively as they used to, nor as they'd like to. Nor are they reading as broadly as they'd like or as they used to.

Instead, they're scanning, looking for useable bits of information rather than letting an argument sink into their consciousness, challenging them to rethink their assumptions and perhaps come up with something new and original... Reduce that fecund, engaged social component too much and knowledge production becomes technocratic. Systems and data sets become ends in themselves, with people more and more removed from a sense that their take on things counts, and from the social habits of face-to-face dialogue that ensure it does. (Menzies & Newsome, 2005)

We, on the other hand, do not believe that technology and critical thinking are mutually exclusive. In fact, as we will see, students go to great lengths to try to create their own curriculum, only to be forced to abandon their own interests in order to serve the agenda of someone else. We often see genius outside of class, through course related blogs or other student technological interventions that students don't dare or care to share publicly in class. We believe that the best type of learning happens when individuals are internally motivated to follow their own passion and directions in areas where they have a particular interest or skill.

Bachelor of Education Compulsory Laptop Program

Laptop programs, like everything related to curriculum and pedagogy, are never neutral (Moll, 2001). They are created, engineered environments embedded with values and biases. Our personal experience and the emerging themes from the initial data collected (individual and focus group interviews and surveys of junior intermediate and intermediate senior B.Ed. students participating in laptop program in a Canadian university) led us to want to further explore the questions raised by unlimited student internet and computer usage in teacher education. (The former Dean of Education at the university where the study was conducted would tell students that they were authorized to use their computers at any time without the permission of the instructor.) We believe educators must create

and discover ways to engage and merge technology, community and critical thinking. We believe that unlimited student access to laptop computers in a wireless environment raises important pedagogical questions and possibilities, including new challenges for participative and dialogic forms of pedagogy and community building needed for critical dialogue and thinking. We suspected, at first, that laptop immersion programs might be one of a host of other well- intentioned but misguided attempts to improve teacher education. However, we came to see that, at least in the case of the compulsory laptop program we studied, it can be a positive contributor to the effort to improve teacher education and student learning. We believe we need to model and inspire self-directed learners, and technology can be used to meet this end. In addition, we argue that the way computer technology in universities and schools is being used is transforming relationships between educators and students and students and their peers.

Methodology

We approached this initial pilot study of a compulsory laptop B.Ed program with a qualitative research methodology, including 20 semi-structured individual and 10 large focus group interviews among 240 B.Ed students enrolled in a laptop program at a Canadian university. Our research was an attempt to honour the voices of our students, and to take them seriously without romanticizing them. We have endeavored to honour their voice in this article, and whenever possible will allow the students to tell their own stories in their own words. This study attempts to co-interpret and amplify the voices of the student teacher-informants for new audiences.

Over a hundred and ninety of these students also responded to an in-depth survey of open ended questions, which were administered before the individual and focus group interviews. The surveys and transcripts were read and reread by the researchers with the goal identifying emerging themes in the data. The researchers engaged in continual interpretation and reinterpretation of the data, and challenged one another's readings and interpretation before identifying these initial themes explored in this article. We do not make any claims about the generalizability of our initial findings.

We asked our students:
1. To tell us whether they would want to teach students in a laptop program, iven their experience being students in a laptop program;
2. To share their personal narratives with us after being involved in a

laptop instructional and technologically focused teacher training program for one academic year;
3. To tell us how they used their laptops in class, while on teaching practicum, and at home;
4. To tell us about the impact of computer technology on their instruction by faculty, and on their own learning; and
5. To assess how prepared they would feel to implement computer-based instructional approaches and techniques in their future classrooms after having completed the program.

Impact of Laptops on B.Ed Students Classroom Learning

The following quote was excerpted from a completed student survey: "For class time it is not beneficial. It's a boredom thing. You are not challenged in class. You have this computer sitting in front of you and you know that you could do something else." This quote reveals a lot about how the student perceives what is going on inside the classroom and the power that the technology provides for them to create their own curriculum, a curriculum of their life. We believe that the laptop provides as much a means of escape for some students as does a window, their own imaginations, or just tuning out. Almost all of the students interviewed made similar admissions to a student who said, "I have used MSN in class, checked my email, played solitaire, but also in other classes I will sit and do other work and research on the laptop. Instead of doing it at home I do it here." Another casually admitted, "email msn, I am guilty I do it all the time." Students frankly admit turning to the computer in front of them as a form of resistance. In addition, with the heavy demands on data collection and inputting (rather than analysis) placed on students by the B.Ed laptop program, and strict attendance policies, students describe often using instructional time in one class to work on tasks that they have been assigned in other classes. This might have something to do with the nature of B.Ed programs or schools in general. Along with daydreaming, sleeping in class, looking out the window, and talking, the laptop computers in classrooms are described as having become another means of escape, or of conscious or unconscious resistance for students. Students who use their computers to complete unfinished work or to entertain themselves may very well meet the attendance requirement by physically being in class, but they likely do not meet the requirements to engage critically with their minds, body and spirit in meaningful discourse, group problem solving, and the co-construction of knowledge in cooperation with their peers and their instructor.

We have had some notable success since this project was completed with engaging students disengaged in class through the development of class blogs. This allows students who do not dare or care to speak out in class to participate in knowledge co-construction. We believe that this student disengagement is something that cannot be blamed on technology in the classroom because, as mentioned above, resistance comes in many forms. Again, the discourse around technology in the classroom is not neutral, and we are, in part, trying to expose and problematize this. If you believe that the information that the teacher is imparting is crucial, then whatever students use to resist this information is a problem. On the other hand if you see people as capable of truly creating and seeking their own knowledge and making decisions around what information is helpful to them, then giving them a tool to seek this out, like a laptop, is laudable. Those who argue that students need to co-create knowledge through active in-class participation need to be reminded how few students actively participate in even a very limited sense to the co-construction of knowledge in a typical teacher education classroom setting. The students reported that in the majority of their classes the most time is dedicated to instructor PowerPoint lectures and monologues from the same small group of students. While excellent critical lectures may engage, inform and inspire, these lectures are rare, and there must be limits placed on their length and frequency if they are to be effective (Shor & Freire, 1987). The students informed us that most "talks" they receive are focused around a PowerPoint presentation projected onto a screen at the front of the room, but we ask, is a lecture with PowerPoint better than a lecture accompanied by extensive lecture notes? With 40 or more students in a room and classes running for 1 to 3 hours, the teachers end up doing most of the talking, and the reality is that some students do not speak at all, and are often completely disengaged from the lecture. In short, as we will see below, the critical and catalytic lecture is a rare thing, and lecturing even accompanied by a PowerPoint needs to be used with caution in the classroom.

Another concern that many students voiced in interviews and surveys is captured in the following quote from a female student in one of the focus groups: "Stick to teaching teachers to teach and do not distract them with flashy technology." In each of the focus groups, students overwhelmingly expressed concern that their laptops detracted from the purpose of a faculty of education, which they said should be teaching teachers how to teach, not teaching teachers how and when to use their laptops and computer software. For the majority of the students interviewed and surveyed, teaching seems should be more

about approach than technique. One female student teacher explained this imbalance in an individual interview for us:

We get a technical approach to teaching, with endless PowerPoint lectures on what to do in every teaching situation. It is all so scripted and automatic. I think approach matters more. We need to model openness and risk taking not step by step, the everyone stay together now kind of hand holding learning...

In the focus group and interviews, students echoed one male student who said, "Teaching is determined more by relationships than flashy presentations and graphics." Another male teacher attempted to sum up his focus groups position at the end of one focus group session by explaining,

We have teachers here that instead of knowing our names, spend countless hours designing PowerPoint with sound and absurd canned corporate graphics that are supposed to inform us but do little but entertain us. Whatever info they have must fit into four bullets...not a lot of depth.

In another focus group, a female student explained how she felt that the approach her instructors were taking in her laptop program was miseducational:

There is a tendency to load us down with presented information; the technology allows them to rip through really important and complex things. We spend no time thinking critically, we are just asked to consume all this info delivered in slick ways, but they never explain complex things clearly. We think it is more important to learn how to ask clear educative questions than being able to use some marking software, or unit template.

In the focus groups, surveys, and individual interviews, perhaps not surprisingly, the students reserved much of their ire for their assignments in the laptop program. In one focus group a young female student explained her concerns this way:

Our professors seem to forget that we already have degrees in our fields and are used to working in-depth on important topics, but they seem to think that they have to have some silly make-work project for

us to do on our laptops every day. It is almost like they are trying to use the tool just because that is what they have. We rarely dig deeply, or allow us to pursue our own interests and curiosity.

Many as well expressed that they like to teach themselves, or learn outside of class or library seminars.

That said, it is clear from our data that the participating students were initially attracted to the laptop program and are supportive of these programs because of a popular belief that being involved in a laptop program makes them more marketable as teachers, rather than believing it makes them better teachers. As one student stated to great laughter in one focus group, "I don't know much about asking questions, relating to kids, or designing curriculum, but my resume looks good, and I can make handouts look real good!" Unfortunately many students questioned the degree to which they have a right to claim expertise in computer technology after they have completed the program. Students report being humored by the number of prospective employers they have encountered who believe that students who graduate from a laptop program are skilled in using a wide variety of software. One student shared in an individual interview how she thought it was false advertising,

The university makes a big deal about the laptop program as if we have all this skill and mastery, but many of us know very little, and the schools we have been teaching in don't even have the programs they have taught us.

In the interviews it was clear that the students, perhaps correctly, believed that being part of the program will make them more marketable to prospective employers and that they would be willing to "stretch" the truth about their skills if it will get them a job. In one focus group a female students summed up her group's position:

This program has a good reputation. I am going to make it work for me. I have not learned a lot in the classes, but I know I can learn whatever programs a school wants me to learn on my own time, and probably faster as I learn, like most of our group says they do, by making mistakes and kind of exploring a program. Not in the guided, stay with me approach in classes.

Another expressed how she felt embarrassed when she was asked to work with a marks program, because she did not know where to start despite having had what students consider a minimal amount of training. Others shared how they felt afraid because of what prospective employers and colleagues would expect them to know. The students clearly reported in the interviews and surveys that they are often asked to learn many software programs not used or available in schools and that they learn it in the worst possible way: as an abstraction. On the other hand, another large group of students suggested that much of the technology-related training they receive in their B.Ed program could be quickly picked up when they are in the field, or is already obsolete, or will be by the time they get the chance to teach it.

The students overwhelmingly identified classroom dialogue and discussion as the most effective learning strategy for them as teachers in training, in comparison to computer-related activities or PowerPoint supported lectures. In one focus group a female student summed up her group's feelings by saying,

It's like all of our experience doesn't exist. We have lots of knowledge in our section. Many of us have taught outside of schools, and had good careers, but our knowledge is ignored. It's like they don't want us to share, or build community, which is what a class is about, is it not? It's like their afraid all the time that we are going to like question their prof's status as the expert. It's like they are hiding behind the technology.

Further, many commented on how having computers in their classrooms results in less student-student and teacher-student interaction. They suggested that issue-based discussions are educationally engaging and that sharing, cooperating, creating and challenging their peers is their preferred way of learning. As previously mentioned, most students surveyed suggest having screens in front of their faces interferes with this preferred learning strategy. One student expressed it this way: "I think the laptop really takes away from dialogue and human interaction. Instead of people talking to each other, they sit there and type. No face to face, but through computer." Another student observed that, "in classrooms where everyone is quiet that means they are off task, because when they are told to close their laptops everybody talks and they don't stop." This a powerful narrative that exposes the power laptops have on students' interaction with each other and the instructor. Recently, one of us (Ricci) spoke to a teacher

who taught in a laptop program in a 9-12 public school. When asked if she liked teaching in that program, she said she loved it. The students were quiet and well behaved. When asked if the students were ever off task, she laughed and said, "of course, all of the time." She went on to share with me how one student was caught downloading and burning pornography during her class. As the conversation went on, it became apparent that our students have gained some wisdom about teaching in a laptop program, by virtue of being part of such a program themselves. When students are quiet and well behaved, it may be because they are completely disengaged and off the prescribed task. It is useful to remind ourselves of Marshal McLuhan's notion of how the medium is the message. Computers and the internet are not neutral and the medium has changed how we interact with each other, and with ourselves. What are the challenges posed by this power and what are the possibilities for its use in teacher education?

Again, we want to go back to thinking about this in the context of examining the political nature of our assumptions. Times have changed, and expecting our notion of schooling to remain the same will take us down the wrong course. For example, when students are considered to be "off task" just what does that mean? We would like to remind you of Gatto's (2008) notion of open-source learning where "everything under the sun might be a possible starting point on the road to self-mastery and the good life." So when we say they are off task, we need to ask: according to whom? Furthermore, simply adding a new technology and changing little else is not a fair and comprehensive way to proceed. To take a parallel example, after open classrooms were introduced in Toronto and surrounding areas, the eventual consensus was that this was a failed experiment. However, one cannot knock down walls without change teaching strategies, and expect to succeed. In many open classrooms, teachers continued to teach in a traditional facing rows of students in desks. Not surprisingly, many concluded that the environment was too noisy and not conducive to learning. When changes are made they need to be supported by other changes that make sense given the new context. Similarly, simply adding computers and not giving students the trust, freedom and responsibility to engage with the technology is bound to create problems. The work of changing instruction is challenging for educators dedicated to traditional curriculum delivery and those using critical participative pedagogies alike, but these are not technological challenges.

Many schools and boards control and monitor student and teacher computer and internet usage, thus banning the most powerful places

and spaces of learning in our time. When the authors send their school-based friends' emails that contain YouTube videos, podcasts, or even academic web links, many of the recipients cannot open them until they get home because the boards have blocked these sites. The end result is that the spaces and places of potential learning are blocked in our formal common houses of learning: schools. We should be asking: What educational argument can be made for limits being placed on laptop usage in certain classes at certain times under the discretion of the instructor? What possible learning opportunities are students missing when their computer usage is closely prescribed and monitored?

In the focus groups and individual interviews, participants described how the laptop program as implemented does harm to teacher-student relations inside of the classroom:
Serious arguments have broken out in some of our classes. A lot of students don't like being told to close their laptops for a discussion or activity, or even when we are presenting even. Some profs don't say anything, but some centre the students out and don't let up. If the class is worth it they don't mind but if it is just another PowerPoint forget it.

Some students said that laptop programs may limit teacher education students' interaction outside of class, while still in the university. Many students shared how there is no conversation at lunch because students are too busy engaging with their laptops. They argue that it separates students and people from those they are physically closest to by facilitating chats, messenger, and email. The university is wired and so students can use it practically anywhere on campus. One male student in a focus group explained,

Everyone has their face in their laptop, doing a bunch of stuff at once, No conversation, and not a lot of school work. So many people are away from home and keep in touch with their friends at home, and head back on weekends do they are setting stuff up all the time. A lot of us are only here in body a lot of the time.

We now wonder if this argument belittles each of the students' individual abilities to determine what they need emotionally, cognitively, bodily and spiritually. Who should decide what they need to know, how they need to learn it, and when they need to learn it? In other words, how can we measure whether the quality of what

students are doing with their laptops is less valuable, less socially and educationally enriching for them than sitting down and talking with others, or working on assignment they can complete according their own schedule? Furthermore, students still engage and talk face to face with others. We believe that what is off task and what is valuable varies greatly among individuals and we need to respect, trust and give adult students the freedom to explore, find and pursue their internal passions.

From one perspective, the use of computers by students during instructional time is a source of distraction and sometimes even frustration for instructors and other students. One student commented, "It must be distracting to teach when students are typing away on the computers. It is also distracting to try and listen when no one is paying attention." The question we ask is, is the issue having laptops in the room or is it that no one is paying attention? There is often stress put on instructor-student relationships caused by non-instructionally related computer usage, and relationships and interactions between instructor and student teachers are sometimes strained. The students in the program are all adults who already have an undergraduate degree. Many feel resentful that some teachers are constantly telling them to lower their laptops and pay attention. One student proudly related how, "I am notorious for scoping out the class for the one place where I will not be caught and yelled at for having the lid up." For us, this highlights the larger issue of schooling where students are forced to seemingly participate in tasks in which they are clearly not interested or capable at that time of participating. If we have to use force to get learning to happen, will learning happen? Can learning happen in less coercive ways? For us this study has helped expose larger issues around forced schooling and its limitations in technology education that we will explore further in future research.

Another student related how when lights are out and they are watching a film, some people are gaming. He found it extremely distracting and rude. Are these people being rude or are they exercising their need to resist? Are they being critical in their own way by resisting? Howard Zinn (1970) writes that disobedience is not the problem, but obedience is.

How do student teachers use the technology?

The students were also asked in the survey and interviews to identify their most frequent use of computer related software programs in support of their classroom learning and practicum instruction. The

students indicated in the surveys, individual and focus group interviews that their most frequent uses of their laptops involved using MS Word, MSN, and email software, but often for personal and activities that were unrelated to instruction. Once in the field students related how they never or rarely used their computer during their three months of practicum: "I rarely used the laptop as an instructional method—it was used to write lesson plans for the most part." In many cases, the technology was not available in their schools, or they were not allowed to connect their laptops to the schools' systems because the schools were afraid of getting a virus. Another reason was that the laptop might upload software that the schools cannot share because of strict contractual agreements. Another student summed up her use of the laptop in the following way: "My laptop was used primarily to type up lesson plans...create a PowerPoint presentation, as well as type up my teaching binder." Students worried that they were spending too much of their limited time learning to use software programs in content area courses that are not available or used in schools, or are already obsolete. Given that the laptop program generates a significant profit to the university, coupled with the marginal use, they get we wonder about the ethics of implementing a compulsory laptop program, with the mandatory purchase of university selected hardware and software.

The use of computers often results in an overemphasis on typing and formatting of assignments. Students informed us in each of the focus groups that the laptop program instructors encouraged students to utilize available computer technology to create visually stimulating presentations, rather than thoughtful and in-depth analysis. In our view many instructors in the laptop program most often stressed presentation over content. As one student admitted during her focus group "most of us" use our laptops as nothing more than "suped-up typewriters."

In the focus groups, the students complained that the laptop technology is quickly obsolete, and while they acknowledged the convenience of the laptops for storing, and retrieving information, they noted that this function could be more easily achieved with stick drives worn on a keychain or around one's neck.

Despite these criticism, we can't resist asking ourselves if one of the greatest dangers of a laptop program is that it will succeed too well. The danger is that the students will internalize the value of laptops. When asked if they believed whether the laptop has contributed to their instructional effectiveness, some students, too many for our

comfort, have endorsed PowerPoint: "Yes – especially the PowerPoint." Or when another student was asked, "Do you believe having a laptop in class enhances your learning experience? Please explain," the teacher candidate responded with simply, "Yes, it's so obvious that I cannot explain!!!!" We believe this is miseducation. Along the same lines, another student proudly shared how in her physics class, instead of setting up labs and experiments to show students, she simply used PowerPoint. We challenge this type of interaction with students as being inauthentic and not embodied learning. PowerPoint is not the same as having students feel, smell, taste, touch, see, and interact with the learning. Again, though, we ask, do the laptops intrinsically lead to a lack of critical thinking, or does the problem have to do with the restrictive way that they are currently used in this teacher education program?

Conclusion

Emphasizing and relying on computer technology has implications for what it means to be an educator and an educated person. For example, our research suggests that many believe that laptop programs may lead to a de-emphasis of discourse, community building, critical inquiry, and deeper skill learning. This could possibly result in shallower learning, stressing style of presentation over substance and depth. We, however, counter by asking whether this is inherent in laptops and technology, or if it is rather the lack of imagination and creativity in the pedagogy and curriculum, and the restrictions that are forced onto students that leads to this belief.

Furthermore, the fact that laptop programs divert resources from other teacher training resources and staffing makes this issue much more pressing. Simply introducing technology, without thinking about what will be done to support it in a more holistic way, fosters the falsehood that technology is a social and educational cure-all. Computer literacy in itself does not equal critical thinking, nor does it fully develop social relational and communication skills required of teachers. Our study suggests that using technology in limited ways may encourage uses of software that simplify complex issues, ideas and theories; lead to dumbed-down content of courses as instructors over-rely on online resources; and rationalize huge expenses that could be spent in other ways. In other words, access to information supplants teaching interpretation and critical thinking skills, leading to an emphasis on form over content. We believe that it does not have to be this way. We believe that trust, respect and freedom will liberate

the power and potential of technology in the classroom and beyond.

Perhaps the clearest message we received from students about the value of a laptop program was when we asked them if they would want to teach in a laptop program. The response we received in all of our interviews was the same: Loud laughter and a resounding NO. When we asked why they are so against having their students have laptops, their response was summed up by a teacher candidate who said, "As teachers we don't want students to have laptops because they will probably use them the way we use them. They are a distraction and facilitate students' being off task." We agree that using laptops this way -- as yet another a way to manipulate students to do what the teacher wants and not allowing students to fully engage with the technology on their own terms -- does lead to the negative vision expressed by this student. If teachers have little to offer students and students are given a glimpse of a world of possible learning, how can any teacher compete? Teachers need to learn to embrace the technology and support students. Schooling needs to see technology as a complicated ally and not as the enemy.

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