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Analog Classrooms in a Digital World

In the time it takes you to read this sentence, Google will have queried 694,445 searches, 370,000 total minutes of Skype calls will be handled, 13,000 hours of music will be streamed on Pandora, 695,000 Facebook statuses, 6,600 Flickr photos, 20,000 Tumblr posts, 98,000 tweets and 600 new YouTube videos will be posted. Obviously, technology has become our primary medium of sharing information. Why then, hasn’t the latest tech infiltrated our education system in the way is has our personal and business lives?

On Thursday, September 11th, Dr. Gerhard Fischer of the University of Colorado’s Computer Science department, Center for Lifelong Learning, and Institute of Cognitive Science hosted a disquisition on Massive Open Online Courses, also known as MOOCs. While his lecture focused primarily on contrasting MOOCs and large collegiate lectures his thoughts on the impact of technology-aided classrooms were very intriguing to me. Although one could argue that MOOCs “are the textbook of the 21st century,” (Fischer 25:45) I found it even more fascinating that nearly 84% of students of enrolled in MOOCs held some type of college degree (Ha). Young in my academic career, I am all too familiar with the technology-deprived classrooms of American high schools. While Dr. Fischer primarily focused on MOOCs, his meta-topic of technology-infused classrooms led me to ponder why the proving grounds of collegiate learning stand destitute of new learning technology, and what can be done to win the attention of a technologically crazed generation.

Despite catering to a demographic that is typically highly responsive to advances in technology, institutes of secondary learning “continue to use ineffective and outdated methods” (Drown) that inhibit students from learning at their full potential. There are certainly many inherent difficulties with implementing new educational technologies across an entire school, ranging from issues with reliability, to technologically inept faculty. There are however, viable solutions to these barriers, which would allow schools to make effective use of educational technology.

Thus, after both the installation of cutting edge teaching products, and appropriate administrative responses to present predicaments with new technology, schools across America would be able to teach in a manner that better responds to “the cognitive learning needs of students” (Kennedy 2).

The greatest controversy over wired classrooms is undoubtedly the true pedagogical worth of cutting-edge teaching tech. Many high schools are concerned that overrated SmartBoards, Elmos, iPads and laptops loaded with the latest software will end up neglected as teachers “struggle to find the time to effectively incorporate them into the curriculum plan” (Cleaver). The question remains: Are these fancy new devices really worth the hassle? They certainly are; as John Stephenson, Director of Communication and Technology at the American Legislative Exchange Council states, technology in the classroom should no longer be thought of as a “nice benefit, [as] it can be an effective tool to improving the U.S. education system.”

One of the most powerful aspects of new teaching products is their ability to foster greater student participation. Various student response systems, such as iclickers – commonplace at many universities, but rarely seen at the high school level - allow students to engage with the material being presented by answering questions on topics being discussed. Another product aimed at involving learners is called Nearpod, which allows teachers to push interactive slides, quizzes, and videos to an iPad in each student’s hand. Technologies like these can have a profound impact on retention of material, through engaging presentations which “avoid [the] fundamentally de-humanizing experience” (Salman 7:21) of one-directional lectures.

Some technologies such as Salman Khan’s education website, Khan Academy, are being used to provide teachers with powerful analytical data to monitor individual students in their progress through a topic. As a class moves through a subject, individual students complete assignments through the Khan Academy’s website. As the learners complete these lessons, very specific data is logged on their progress, such as their accuracy and time of completion for specific problems. By using this information, faculty can pin-point conceptual gaps in a student’s understanding, allowing them to intervene and “make their [teaching] interaction as productive as possible” (Salman 12:52). Salman Khan’s powerful product, and others like it can give teachers to teach efficiently and monitor student progress like never before.

Education technology also comes in handy for helping instructors teach complex concepts, such as advanced STEM topics. This type of material can be very difficult for students – especially those with Specific Learning Disabilities (SLDs) – to master, as it is often laden with complicated, multisyllabic terms. As struggling learners sit through “endless fast-paced lectures” (Kennedy 2) they may have trouble differentiating between important concepts and useless details. These non-stop lectures fail to deliver information in a manner which supports learning as students become lost in a barrage of large terms and technical jargon. One solution to teaching demanding concepts is the use of Content Acquisition Podcasts, or CAPs. CAPs are short videos or presentations which use “still images and occasional on-screen text, and contain carefully constructed narration to deliver instruction” (Kennedy 4) for a single term, concept or piece of information. CAPs have been proven to help learners with and without SLDs by providing solutions to “ineffective instructional methods and cumbersome content demands” (Kennedy 6). By incorporating Content Acquisition Podcasts into classroom learning, it is possible to overcome yet another barrier in the education students, especially those with Specific Learning Disabilities.

Embracing advanced technology in classrooms can present considerable challenges which “institutions must address [to stimulate] faculty adoption” (Butler 28). Without actively engaging these issues, embedding new teaching products on a large scale would surely result in a disastrous waste of potential. Some argue that adding new technology in classrooms is a poor decision as the products themselves may interfere with teaching process. This threat is a very real one: a study showed that teachers reported classroom hardware or software as having about a 2% failure rate (Butler 24). To put this number in perspective, a car driven twice per day with this same failure rating would break down 14 times per year; certainly an inexcusable number. A large percentage of the same faculty stated they “were not satisfied with campus responses to problems” (Butler 26). Therefore, to avoid issues of failing technology, schools must implement a robust IT support team, to manage, maintain and occasionally troubleshoot new technology. This team must be well trained, well equipped, and have a large enough staff to adequately respond to technology in need of attention, before it has a disruptive impact on classes. With the addition of a “support system [which] would promote effective use of technology,” (Young 3) malfunctioning equipment would never halt the educational process.

Another area of concern regarding new education tech is the considerable task of properly training faculty members to use classroom technology. A significant lack of institutional support is quite evident at some colleges which “have spent far less time & money giving professors the skills to use even the simplest technology effectively.” In fact, some students go as far to as to say that “their professors are less effective [using new educational technology] than they would be if they stuck to a lecture at the chalkboard” (Young). Often, less tech-savvy teachers have a kind of “computer anxiety [which] is a major cause of resistance to using computers” (Christensen 412). However, the teachers should not to be blamed for this ‘computer anxiety;’ faculty respondents in a study cited a “lack of time to learn as the most critical factor in the adoption of instructional technology” (Butler 25). Therefore, it should be the responsibility of schools to implement training programs which work with faculty schedules. These seminars must be run at times which would allow for faculty attendance – such as during school breaks, or on weekends – and should also be incentivized to promote teacher turn-out. Virginia Tech, for example, “offer[s] professors new office computers as rewards for attending its three- or four-day summer technology workshops,” which has lured an impressive 96% its faculty to past programs. By encouraging teachers to attend school-run technology training programs, administration can guarantee that newly purchased technology will not go unused.

There is a great deal to consider with the integration of new technology in classrooms. Many considerable obstacles exist to deter school administrations from incorporating new technology in classrooms. Complications such as developing a full-scale IT team to maintain hardware and software and creating programs to educate faculty are certainly sizeable tasks. However, the powerful, analytic, interactive education which new technologically advanced teaching products can provide are surely more than worth American schools’ time, effort and investment.

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