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Mr. Joseph M. Tabas, Indiana University-Purdue University, Indianapolis
Mr. Cody Mathew LeMay, Indiana University-Purdue University, Indianapolis
Elizabeth Freije

Online Education: The End of Learning?

Abstract

The Internet has invoked some of the most profound changes in societal mores, perhaps none more detrimental than that of its influence over our approach to education. As educators we were cautioned about potential pitfalls of online education by Neil Postman in the 1995 publication of Virtual Students' Digital Classroom. This foreboding account of how the Internet will impact teachers and more to the point education, postulated that availability and access to materials does not correlate into motivation to learn. Considerations for the necessary infrastructure, and training to use that infrastructure, plus the overall effect on learning, have yet to be thoroughly addressed. Before we commit to this level of dependence, we need exhaustive research to address the many concerns with which a cultural shift of this magnitude demands.

As learning institutions across the country strive to meet swelling student enrollment, a strong push toward this unproven pedagogical approach is quickly becoming the norm. This wonderful technology brings with it the hope of easily accessed education with the convenience contemporary society demands. While most institutions tout the vastness of their online education market share or the revolutionary new resource delivery system, there is no mechanism for assessing the quality of online education. As educators, this aspect cannot be overlooked.

Through assessment of the current online education standards, faculty instructional approaches and student feedback, a clear and ominous conclusion has surfaced. Without the development of quality control measures, online education is giving rise to the end of learning. The focus of this paper is to discuss concerns with online education and propose a solution to address those concerns.

Introduction

The Internet is a vast and wonderful technology, providing infinite access to information and, as well, many innovative communication and educational modalities. The latter, our subject, is widely debated as the integrity and, by default, the value of online (Internet based) education is questioned by society, students and more importantly, industry.

However, with the demand for education exceeding the ability of universities to supply it, and the ever increasing budgetary constraints, many are choosing online content delivery [1]. This solution allows universities to increase enrollment far beyond the capacity of its physical infrastructure, in addition to acquiring students beyond the boundaries of its state or even country, greatly increasing the capacity to service educational demand. Additional enrollment capacity however, is not based entirely in altruism; the school's revenue stream is greatly

enriched by the additional enrollment and by its ability to attract a multicultural cohort. While these practices do not hinder the educational process, they are potentially nullifying, to the quality of online education in favor of marketable statistics [2]. The result is shifting the focus away from quality of education and placing it on marketability.

The level of which online education is successful compared with that of the traditional face-to-face model lacks a true measure. In combination with collegial movement toward the end of the traditional lecture model [3], online education is quickly altering the educational process. This revolutionary pedagogical idea is timely, possibly even appropriate, but without a measure for the integrity of online education, we are limiting education. We seek to address this statement, postulating a solution that provides both the integrity demanded and the innovation needed to develop true education for the online platform, avoiding the end of learning.

1.0 Integrity and Quality of Programs

Integrity for many universities is rooted in accreditation and reputation. Accreditation attracts students, assures industry of educational quality and most importantly, it creates a standard that universities must adhere, a measure of uniform educational quality among the accredited (ideally) [4]. Accreditation Board for Engineering and Technology (ABET) serves as the accrediting body for many engineering and engineering technology programs, accrediting over 500 higher learning institutions [5]. While the value of accreditation may be debatable, currently it is the benchmark of engineering and engineering technology schools, and certainly adds to the integrity of accredited universities. If and how online courses and degree programs will impact our integrity is somewhat unknown, but should be a factor during online course development.

Of equal importance, the works of faculty and graduates provide universities gain in reputation: an import consideration given the pervasiveness of online education. If the students are not learning the same level of course material, or are not exposed to the same level of material as students in traditional learning environments, the graduates will be less desirable and adversely impact the reputations of our universities. A recent survey found that less than half of online instructors used relevant activities that involved critical thinking, problem solving, or realistic simulations to support supplemental information and concepts introduced in the course, making this concern more of a reality [6]. Given the foundation of engineering technology is comprised of real world application compounded with critical-thinking and problem solving. The failure to deliver such exercises provides mere imitation of education in contrast with the face-to-face model.

Virtual classrooms provide an array of configurations to appease the preferences of the mediators. Such configurations remove some conventional mechanisms for education and can misrepresent self-study as a web-based learning experience. The authors of *Online Learning as Information Delivery: Digital Myopia* agree, saying that course instructors often times succumb to easier means of mediating classes by configuring the site to time-release information,

assignments, and examinations which lessens the obligation of student-teacher interaction [7]. This time-release basis also solidifies an inflexible routine that may not be attainable by students with other priorities or commitments outside of class [8]. Student-teacher interaction is crucial to the learning experience, immensely so from the student perspective. From this aspect, effort from both the educator and student must be put forth for interaction to be an effective component of education. Education is rooted in visual and audible contact between mentor and pupil.

Another complication is quality of work from students. Plagiarism and cheating in general is not a new phenomenon among students. Luckily, it is not an overwhelming problem and typically only occurs within a small percentage of students. Even the alarming occurrence of students purchasing papers and exams has marginal impact in the traditional in class educational model. The tools we have to aide in the discovery of such transgressions are extremely effective, often preventing students from considering such acts. Unfortunately, online education is more susceptible to such problems, additionally posing a new set of unique and previously unencountered problems. Compounding this issue further is the lack of discretion on behalf of the instructor. In many cases, instructors may suspect cheating or plagiarism but are reluctant to act on it [7]. This only adds to the momentum of the viscous circle of cheating and plagiarism for students. The lack of reprimands entices the daring of students to cheat at a much more severe degree. The boundaries of academic dishonesty have been pushed to the limit in a new way and remain unchallenged presently. Counters to such actions should be thoroughly explored when creating web-based courses.

It is virtually impossible to verify the student's identity on the other side of the computer. Who is really attending the class? Who or how many students are really taking the exam? Without these answers, we diminish the integrity of our programs and our reputations will suffer. Any platform planned for online education must address these questions at a fundamental level. To preserve the reputations we work so hard to build, we must verify identity and maintain the high level of integrity demanded by industry and society.

2.0 Delivery of information

Current practices in online learning range from standard courses adapted to an online format to entirely new courses developed for the web. As online courses continue to grow in popularity among students and universities as a cost effective, efficient means of education, many challenges and opportunities present themselves.

The use of software and online interfaces as a means to interact and reach the virtual classroom is the main format used today. As Abel wrote, "Online learning has made great strides in higher education in the past five years, with wide adoption of course management platforms such as Blackboard, WebCT, eCollege, and Angel, as well as emerging open source solutions [9]."

These online tools promote a key benefit to online coursework, which is easy access and convenience to work at one's own pace.

A current challenge instructors face is how to use these tools effectively creating an online course environment that rivals an in-person classroom experience. "Many institutions … have found it challenging to achieve faculty use that truly enhances the learning interaction between faculty and students as opposed to simply posting materials online [8]."

Research studies have confirmed that best practices exist for online learning [8, 9], yet the main influence in student outcomes is the instructor and his or her approach to teaching [9]. One example is how might the instructor combat the loss of interaction forced by a classroom setting? "One of the most interesting challenges and opportunities … is to figure out and invent ways to include reflection and critical thinking in the learning (either built into the instruction or through a process of instructor-led debriefing) [9]."

Knowing that reflection and critical thinking are essential for learning, online instruction must include a means for teaching the students how to reflect on the educational process and learn from the experience. This concept is difficult in an online course, and online instructors must incorporate opportunities for students to consider the ways they solved problems, not simply finding solutions, submitting the answers via an online format and moving on to the next question or chapter.

One challenge with online courses is the lack of interaction with other students and instructors. In-person interaction provides students and instructors with opportunity to communicate beyond text and "push-pull" exchange of assignments.

While advances in technology provide many ways for students and educators to communicate, the lack of personal interaction can take its toll on the educational development, specifically as it relates to problem solving. "Much of what we recognize as learning comes from informal social interactions between learners and mentors. These social interactions are difficult to achieve in mediated instruction [9]."

Instructors might consider requiring video conferencing or virtual group lab time to debrief on a section or chapter of instruction. In addition, a hybrid model of online and in-person meetings might solve some of the challenges presented by the lack of reflection and experiential learning.

One of the benefits of online courses is the ability to work at one's convenience. While being able to work at any hour of the day or night is convenient for busy schedules, working independently removes the opportunity for real time discussion and problem solving with others. "Technology can enhance instruction in remarkable ways; however, it cannot replace the insights that students receive by struggling to make sense of information with both peers and mentors [9]."

This problem solving with others fosters learning, not simply memorization and regurgitation. Online instructors must take this element of interaction in account when structuring courses to ensure that the online course is not about memorizing data and retyping facts, yet instead problem solving and developing a pattern for learning through the coursework.

Researchers have investigated the possibility of online course effectiveness varying based on the generation of the students enrolled. While generational differences exist in the classroom and the virtual classroom, the influence of generations on the efficacy of online courses is negligible. "Generational differences are evident in the workplace, but they are not salient enough to warrant the specification of different instructional designs or the use of different learning technologies [9]." Instructors must identify the challenges presented by multiple generations in a classroom, in person or virtual. However, the fact that multiple generations exist within a classroom has negligible effect on learning outcomes.

In the studies regarding generational effects on online learning, the same principle concept of instruction appeared as the main influencer in student outcomes and efficacy. "As argued by Clark (1983), if the same instructional design is delivered via two different modalities, it makes no sense to expect different outcomes. However, one modality may be preferred over another for other reasons such as differences in cost, accessibility, and efficiency [9]."

The efficacy of a course is based on the instruction, not the modality. Meaning, if the instructor plans the course properly, regardless of whether the course is online or in person, the educational outcomes will be similar if not the same. The discrepancy in online courses versus in person courses relates to the instructor and the instruction.

To summarize the current and best practices of online learning, they are similar to in-person instruction. Current research shows that "distance education and classroom instruction are equally effective as instructional delivery systems [9]." Summary of this study determines that there still is not enough research to make broad based best practice recommendations for online learning. "Such findings, in keeping with thousands of media comparison studies that came before, provide practitioners with inadequate guidance regarding the design features needed for effective teaching and learning with technology [9]."

3.0 The Solution

To deliver a true virtual classroom comparable to the traditional face-to-face classroom, we assess the best practices, psychological profiles and surveys of traditional learning; from this we can see that in most cases, we are trying to duplicate this model in current online course development.

Our postulated solution requires a less specialized approach to online education, focusing instead on the fundamental cannons of education, communication and experiential learning.

The first step is to restore the full duplex model of communication. We need a true virtual classroom in which the professor and the students can discuss and interact in real time. By implementing a laptop program in a university, this first step is easily attained, and in many cases currently underway. Using the camera equipped on the student's laptop, we intend to populate a five by five (or more) grid of camera feeds to the instructor, providing a similar view to the face-to-face environment. This view can be toggled between the live camera feed and the student's desktop at the professor's discretion. Similarly, the professor can switch between views of themselves, "smart screen,"~~,~~ or lab software to be displayed to the students.

During lecture time, as students have questions they simply click a designated key, which causes their video feed to the instructor to be outlined in green, alerting the instructor to the pending question. At which time the instructor can click on the student allowing them to ask the question and the class to hear the question and the response, creating complete dialog in real time.

As we address the specifics of online education for engineering technology, we need to answer the experiential learning, or the "hands on" learning that is a traditional part of our educational model. Laboratory experiments in our solution are resolved in two ways. As the cameras are used in full duplex communication for the lecture, they can be used for the lab, too. Students will build projects under the supervision of the professor, and they can be demonstrated in real time. In some instances, an interface may be required such that the student's constructing circuits, for example, could be assembled and connected to a virtual oscilloscope inside the laptop. The instructor could verify the readings by toggling to the student's desktop view and commenting on the circuit's construction.

4.0 Conclusion

When engaged in a pedagogical discussion regarding online education, one of the most common questions asked is that of integrity. How do we know if the student completing the assignments or taking the exam is actually the student enrolled in course? One of the inherent benefits of our solution is professors can see the students and their laptop desktops. This ability and view adds a level of integrity to online programs, which is currently not in place.

This model does require the forfeiture of the lackadaisical approach to online courses we have become accustomed to thus far. Currently, students simply access previously recorded lectures and course material at will. However, the required meeting times, like those of the face-to-face courses, force students to maintain a schedule increasing their attendance which will result in performance equal to traditional in class learning.

We believe, given the pervasive nature of online education, the development of such an interface is necessary. To maintain the integrity and quality of education provided by accredited universities and the pride enjoyed by students attending these institutions, this interface becomes paramount.

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