Serving Higher Education with Technology – Disrupting Higher Education with Technology

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Abstract

Technology is increasingly serving higher education by enabling student-centred learning and concerted social learning, extended reach to content anytime and everywhere, insights for educators into progress tracking and learning trends, and cross-institutional academic collaboration. At the same time, technology is providing evidence of negative disruption to the core purpose of education, which is human development and individual preparation for the future. Technology is gradually diminishing the capacity of individuals to critically think and reason, to expand into unfamiliar knowledge domains, and to exploit the learning experience to fulfil the market needs after graduation. In this paper, a review is presented on how technology is disrupting higher education, both positively and negatively. Some recommendations are given with respect to these disruptions.

Keywords: Disruptive Technology, Higher Education, Online Collaboration, Social Media Learning Paradigm
1.0 Introduction

Just as in many aspects of life, technology today is becoming a trendsetter to the way higher education is designed, evaluated and delivered. Universities around the world are depending more on technology to fulfil its core functions in fostering creativity, and in acquiring, processing and disseminating knowledge [1]. While utilising technology in education is not a new trend we, nonetheless, are witnessing an unprecedented proliferation in the use of newer, smarter technologies that has started to cause a shift in the traditional paradigms of education. This shift is mainly driven by the exponential growth of knowledge, the need for more quality education, and also due to a changing tendency to depend on technology within the new student generation [2]. Adaptive learning systems, machine-learning algorithms, smart mobile apps, online virtual labs, electronic interactive books, and social media are just a few technology examples universities are rapidly seeking to employ to serve higher education.

Technology does provide the right set of tools through which a personalised learning experience of individual students can be created. Technology enables knowledge to be shared; that concerning student-learning trends and needs. Technology also provides insights and decision support for educators to enhance the overall educational outcomes.

Anyone can then truly argue the immense benefits of utilising technology in higher education. Indeed, through technology learning outcomes can be targeted more intelligently, issues of teaching can be solved rather informedly, and student-learning experience can be evaluated quite effectively. These benefits are rather overwhelming and cannot be denied. While there might be a consensus agreement on the aforementioned argument to some extent, technology, nevertheless, has introduced some negative disruptions on education that should not be neglected or disregarded when a decision is made to embed a technology within the fabric of education.

In this article, a review is presented on how technology is positively serving higher education through the introduction of welcomed disruptions to traditional educational paradigms. In the interim, a discussion is also made on how same technology is gradually weakening the competencies of many students to be creative, to be able to evaluate and to expand on gained knowledge applied to real life issues after graduation.

The discussion is structured as follows: In Section 2, a review is provided about the significant positive role of technology in facilitating the interactive environment of education for students and educators. Through Section 3, a discussion is give about the negative disruptions of utilising technology in higher education. Section 4 concludes this article and provides some recommendations for educators and decision makers on what to consider when a technology is put into used for educational purposes.
2.0 Positive Disruptions of Technology in Education

Previous studies in the literature extensively discussed the role of technology in positively enhancing education and enabling better learning environments. These positive disruptions are summarised as follows:

2.1 Personalised Learning Experience

Technology enables a true personalised learning experience for individual students. Instead of following one unified learning model with all students, technology helps to adapt a flexible evaluation model for each student. Machine-learning algorithms are now able to collect and analyse individual student data to detect learning difficulties and, accordingly, personalise the learning curve of the educational content to better address these difficulties [3]. For instance, based on the academic achievements in a specific subject the student is given a customised set of questions and practice tests. This set, which specifically matches the aptitude profile of the student, can provide an accurate evaluation on what the student is successfully learning and what learning objectives are needed to be reinforced [4]. Since it is most likely that every student may possess a different trend of learning, educators can rely on technology in creating a non-repetitive pattern of assessment to each individual student that most matches the needs and abilities of the student.

2.2 Online Collaboration between Students and amongst Educators

Collaboration between students becomes truly feasible inside and outside the classroom by using online technologies. Technology enables students to share and track subject requirements, to follow the progress of assignments within their groups, and to track their achievements using portals and digital dashboards. Educators on the other hand can easily create and organise requirements, track changes and submissions, view and discuss comments with students, and communicate results with students and management. By utilising technology, productivity can also be increased through collaboration between educators from different academic departments. Online resources, such as reports, templates, libraries, lessons learned and best practises can be shared, and general success trends can also be transferred and adopted [5].

2.3 The Social Media Learning Paradigm

Education is gradually shifting towards encompassing the concepts of social learning driven by the fact that more students are going into higher education with preferences about learning they have acquired throughout their daily use of social media [6]. Most of the students today are digital natives, who are quite proficient with technology. In response to this natural tendency of students to learn via technology an increasing number of educators are starting to post teaching videos and lectures into online channels, such as Coursera, Udacity, Khan Academy, TED-Ed, or even Facebook and YouTube [7]. Indeed, these channels are becoming a social learning stream for many leaners around the world, with no bounds by
classes or that of time constraints [4, 8]. In this sense, education is taking the form of a socially shared paradigm in which educators can even exploit social media to assign different learning challenges to students, to enrich discussions amongst students themselves, and to support student self-regulated learning approach within different educational contexts [9, 10].

2.4 Better Insights into Academic Progress

Technology makes it easier for educators to design customised tests, deliver them through different devices like PCs, tablets or mobile phones, scan test scores with a mobile phone’s camera, and export scores to a third party application, e.g., Microsoft Excel, if needed [11]. Solutions, such as BubbleScore, Knewton or Google Classroom provide powerful analytical tools to help educators to analyse and evaluate the dataset of each student, detect patterns of difficulties and to map results to predefined thresholds. It is true that students do not have comparable types of intelligence. Therefore, learning objectives cannot be achieved based on the “average student” model. As a result, the individual evaluation of each student permits better insights into the learning path of the student in which difficulties of learning can be detected early and a course of customised actions can then be planned and taken to address them [12].

3.0 Negative Disruptions of Technology in Education

Since technology is supposedly offering quality educational opportunities to students, promising better alternatives to tackle traditional learning issues, and also due to the fact that almost all students in this digital age are increasingly relying on whatever technology at their disposal, it is reasonable to say that universities will keep investing heavily in technology for higher education. However, the key to enhance education cannot be achieved just by adding another technology, but rather by understanding how the technology should be controlled and utilised. Although the advancements in technological solutions in education are truly astounding, the researcher believes that total reliance on technology alone hinders the core purpose of education, which is to prepare the educated generation who is capable of thinking critically, evaluating and reasoning real-life issues without the use of any technology.

In a survey on technology-related research that was conducted by Pew Research Center in 2012 [13], the researchers found that technology is altering how students learn. There was a mounting indirect evidence that technology can affect the behaviour of the student because of its continuous stimulation and rapid shifts on attention. The results also found that technology created “an easily distracted generation with short attention spans” where students could not write, communicate face to face, or critically think without the aid of technology [13]. Many students, for example, heavily rely on the AutoCorrect function of Microsoft Word to fix typing mistakes in their reports and assignments. This would only eliminate the necessity for the student to know the correct spelling of words, hence his or her ability to write in a correct style when the technology is absent.
Another issue that was reported in the survey is that students developed an almost total dependency on online search engines and informative websites, such as Wikipedia, in which students became so accustomed to getting quick answers to the point they would stop searching when no easy answer appeared [13]. Indeed, there are concerns related to creativity since finding easy answers with technology nearly negates the need for students to think for themselves, to better learn and remember information, or to originate new ideas from existing ones [14].

Another point of argument is that knowledge acquisition that is transferred from educators to students is partially due to the student’s attention to the nonverbal behaviour of the lecturer. Face-to-face human interaction and mutual direct conversations are extremely vital to the delivery of a quality education, and to the development and acquisition of knowledge-based interpersonal skills. As explained by Brockbank and McGill [15], over 50 percent of the message is usually communicated through facial expression or body language, while about 30 percent travels through the tone, volume or pitch of the voice. People tend to pay attention to the speaker’s voice or body language to deepen their understanding of the conveyed topic. Technology certainly has the ability to remove the nonverbal communication once used in an educational environment. The second important attribute in nonverbal communication is the educator’s awareness of the individual needs of students. Educators are usually attentive to the subtle signs and reactions of students in the class, where educators usually elaborate more on issues when the perception that more explanation is needed. This attentiveness almost disappear when technology is used to communicate the educational material [16].

Finally, technology can also enforce inequality amongst students. Tests and assessments that are customised according to each student’s learning curve, using learning-machine algorithms or any other technology, can still favour some students over others. A student who is reasonably aware of how technology works can deliberately intend to produce a mediocre result at one point to adjust the difficulty of later tests and assessments. Another point of view is that students who are quite comfortable with technology can be expected to produce better results from those who are not. This would only introduce a digital divide in an environment where digital solutions are used only to avoid it.

4.0 Conclusion

Disrupting the traditional ways of education by introducing a new technology cannot be guarantee in enabling better educational environment with proven outcomes that focus on preparing individuals with positive impact on society after graduation. It is true that technology is an absolute necessity in higher education nowadays, but what is more important is how technology is put into use and exploited. Technology is just an enabling tool for learning. It should not be perceived more than that. Technology can, and should, help teachers to monitor how students are progressing, and what difficulties in learning student are facing, but no machine-learning algorithm can replace a human in bringing creativity and problem-solving insights and experience to the classroom, physically or virtually.
In addition, relying solely on technology to evaluate the learning experience of a student can be rather risky. As contended by Bernard Bull, technology should not drive the decisions instead of serving as a diverse collection of tools to help achieve the planned goals of education [17].

Another point on the same level of importance is that we have to be very clear in differentiating between information access and education. Students do need to access information using whatever tools under their disposal. Indeed, online databases and search engines can speed the process of looking up, matching and connecting information, but how information is assessed, digested and relayed within the educational context is what really matters. Students have to learn it the hard way; the old traditional way of digging up information and sifting through hard copies of reference books or libraries should accompany the use of any technology. Such manual searching skills can only be mastered by experience, eventually to draw the potential of the student to relate and summarise notes using pen and paper, to compare and contrast ideas, and to expand on additional related references.

In conclusion, technology in higher education is here to stay, but when a decision is made to rely on a technology that technology should be always scrutinised, totally controlled and restricted to its intended role only, taking into account its limitations and defects. To close this discussion the researcher quotes the following statement from a book titled “The End of Education” by Neil Postman [18]: “All technological change is a Faustian bargain. For every advantage a new technology offers, there is always a corresponding disadvantage” [p. 192]. The statement really serves the argument of this research on the need to ever judge technology and always evaluate the consequences of utilising it in higher education.

5.0 References


