The Importance of Educational Technology to Pedagogy: The Relevance of Dewey

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Abstract. It is commonly said that instructors must be in control of technology, and that technology needs experienced skilled educators with well-developed theories and ideas about its application. However, it seems that technology itself can be used as a driver of educational ideas and classroom practice, not vice versa. This idea can be generally applied to many situations. As educators we tend to feel that the use of technology must be subsumed within current educational practice, or that it is a supplement to already existing classroom techniques, however, technology is a powerful tool to not only improve education around the margins, but to drive real meaningful change.

Keywords: Dewey; education; motivation; pedagogy; technology

Introduction

Since the early 90s the use of computers among the general population has climbed at a massive rate. This interconnectivity allows individuals from any part of the world to interact with individuals from any other part of the world. It allows amalgamations and conglomerations of like-minded people to engage in a worldwide conversation on topics ranging from sports to international geopolitical landscapes. This system has been developed through two main forces, the push from technology developers, and the pull from end users.

The push from technology developers has been large. A multitude of companies producing a wide variety of versatile, cheap, and easy to use pieces of technology have transformed most adults in the western world's pockets from a jingle of coins and keys, to the soft vibration of a device that can access more information than that which existed at the library of Alexandria. This development is unlikely to end or slow down soon. Technology companies are consistently trying to further their customer's abilities to interact and use the technology that they create. The pull from end users has also been a powerful force in bringing the varied and powerful types of technology that we have into the public sphere. People are demanding faster and simpler access to online services from companies, and any glitch or issue is seen as a major problem for

end users of technology. We were once happy to send a 100-character text message cross-country, now we demand HD copies of all new release movies to be instantly available on our phones.

With this development in the use of technology and the Internet in particular in society, there has been a somewhat parallel develop in the application of these technologies to the practice of education. While many educational systems are somewhat conservative in nature, and the fact that they are large hard to move bureaucracies, there has been more and more technology put into educational practice. The application of technology follows a similar process to the process seen with the technology in the general population, in that, there is a push from the top, and a pull from the bottom.

From the top down, many large-scale national education systems at many levels (but especially tertiary) have added more technology into their curriculums, and/or have used online learning to supplement already existing syllabi. This introduction of technology has come in many forms, from general encouragement of teachers to use more technology to technology based lessons as a formal part of the base curriculum. Furthermore, the distribution of actual pieces of technology has been varied, with some schools having smart screens and tablets in every classroom, with others lacking what may be considered basic in a modern educational institution (wi-fi for example). From the bottom many teachers and students are taking it upon themselves to enrich their students' and their own learning experiences. Some teachers are simply pointing learners to resources that might support whatever is being taught in class, while other teachers are developing complex lesson plans, or modes of internet based interaction that can further expand their learners' understanding of the class contents and the world at large. From the point of view of the learners, they too are driving the boom in education technology. Like the population at large they are demanding high-tech solutions to problems that they face learning complex topics. Further to this, more and more learners are searching for contents online that are outside the explicit parameters of the lesson or curriculum they are a part of.

While there are many and varied ways that technology has influenced and impacted education, it is certainly true that the Internet especially has changed our relationship to knowledge and information. This is important in terms of education especially as formal places and institutions of learning are no longer considered fonts of knowledge, more varied forms of questioning and skepticism are considered relevant and there has been a growth in the value of individual opinion. This has changed the place of the learner in education and their relationship with their school and their teachers. While informal learning has always been an important, the availability of complex developed ideas online has furthered learners' academic development outside formal centers of education.

Formal and informal learning are different from one and other in ways that are sometimes hard to distinguish, with the most obvious and common point of

distinction being the institutional setting or framework they occur in. Formal learning tends to take place in places that are more familiar to us as centers of education like kindergartens, schools and universities. The education that occurs in these settings is purpose driven, clearly structured and generally conducted in a location specifically for the purpose of learning. Informal learning on the other hand occurs outside of schools and is generally less structured (Dabbagh & Kitsantas, 2012; Schugurensky, 2000). This can often relate indirectly with motivation as learners in formal settings tend to be extrinsically motivated, while informal learning tends to be self-directed and intrinsic motivation tends to dominate.

It is important to recognize the context that learning is taking place in so that instructors can develop and administer effective learning practices. This is particularly true when students will be engaging online, where the lines between knowledge types and distribution channels can become blurred. As more and more learners are getting their information from alternative sources instructors need to be aware of differing learning contexts to benefit from the Internet as a learning tool (Lange & Costley, 2015).

Dewey and the lack of change

One of the issues in education generally is the lack of change over time. This has been mentioned by many, but deserves repeating. While, it is often thought that the field of education in general is progressive, and educators specifically are a progressive group of people, this for some reason has not led to dramatic changes in the delivery of the education over time. What this means is that opportunities to change education systems are few and far between, and further to that, when given the opportunity to manipulate or improve stagnant systems, those opportunities should be taken.

As a classic example of this we can look at the most famous of education theorists John Dewey. In 1897, Dewey wrote *My Pedagogic Creed*, as excellent and succinct a treatise on education as one is likely to find. In *My Pedagogic Creed*, it is noted that education is in and of itself a social practice, and that practice is not something we have much individual control over and is unconscious and begins at birth and ends at death. We can imagine ourselves as a construction of an individual, generated from social values and social consciousness. This process while not under our direct control is fundamentally a positive process as it allows us to become part of human civilization and "inherit" its knowledge. This view of education ties in with Dewey's views on morality, which can be summed clumsily into a human quest for a higher spirit and a greater good, as expressed as part of a society of a greater whole. A human being can only achieve moral, and educational completeness as part of a society. This empowers society and also human beings who are a part of it to continuously strive to generate knowledge and behave in such a way that the "race's" welfare will be enhanced, which in turn enhances the individual.

While the sociological side of the equation cannot be overstated, there is a second side to Dewey's conceptualization of education, which is the

psychological process that underpins it. According to Dewey, society is the context where education will occur and psychology explains and defines the processes that cause learning to happen. Specifically, Dewey notes that ignoring either of these features may result in "evil" occurring and that we must apply education in a way that is designed to be related to and improve students' lives. We must, according the Dewey avoid focusing on purely academic results as these are not representative of meaningful or authentic learning. We must use our knowledge of the whole of a student's world and the whole of the student's mind to formulate an effective educational situation that will result in true meaningful success for the learner. So while, the whole of society is important, and our values and knowledge are generated from society, we must look at each learner individually, at what they want, what they need, and what their future will be to develop meaningful education for that learner. This is empowering the learner and giving them a real education. For this reason, education should be practical and hands on, and use demonstration of a skill as the marker for underlying psychological success (Dewey, 1902; Dewey, 1907).

In terms of school, it should according to Dewey be a simple extension of the child's life as a whole and be used to build a child's self worth and self-belief. He criticized schools as they were then (and are largely now) as simple "banks" of knowledge, where information is given to the students without meaningful education occurring. He believed that in its current form it was impossible for schools to give students real lessons on anything of substance. He views were critical in regards to assessment as well, feeling that using exams for social ordering was not appropriate, and that assessment should be used as a guide of the student's individual progress.

Looking at, or thinking about Dewey's ideas makes one think that he would not be so unfamiliar with a modern school. It would look very familiar to him, and the things he criticized about schools in his day: testing as social ordering, inappropriate contents, and lack of meaningful engagement with materials are the problems that still plague education today. To say that education systems are conservative then, is an understatement, if the most famous of education theorists can have his central messages ignored for more than a 100 years. This shows that to try and change education for the better, other strategies beyond theorizing should be used to try and improve learning and teaching.

Technology as a means to change pedagogy
For the reasons mentioned above one requires a more aggressive or tangential strategy to implement more progressive educational ideas or concepts into the classroom. Technology can serve as a kind of Trojan Horse whereby technology serves as a means to introduce more dynamic modern pedagogical principles into the classroom. As was written above, educational systems and teachers are often loath to change their ways, so we must find methods to introduce new concepts indirectly.

Motivating learners
We have always at least suspected that children learn best through exploring and playing, but it seems to be true for tertiary students as well. This type of

learning helps develop individuals' cognitive, social, emotional and physical wellbeing. While traditional classroom methods can work, they often do not give learners a great deal of enjoyment or fun. Technology can provide a solution to this, with methods of dealing with new content and information both inside and outside the classroom. Research has shown that there are many advantages to using technology in the classroom in terms of developing learners' critical thinking and social development (Costley, 2015; Costley & Han, 2014). This means that learning can be meaningfully enhanced with modern interactive learning technology.

Most learners will do better if they can apply what they have learned in a hands-on way. This type of learning is generally more stimulating, engaging and attractive to students and allows a greater amount of interaction with others and learning materials. Technology, if well designed can give students something to master that they are intrinsically interested in that may make them more excited to attend class. Much research has shown that more technology in the classroom motivates students to learn. Students can take control of their learning through the use of hardware like computers, laptops, tablets and so on, but also through applying their skills to games, storytelling apps and online media that may interest them more than the same information being delivered in a traditional way. This learning can also be personalized and allows students to study at their own pace. Also, technology can free up the teacher to help students who are struggling, or give advanced students extra material. The ease that video and animations can be applied to lessons, also gives teachers a greater ability to increase the entertainment value of their class. While, there is certainly some decay in the interest students will have in new pieces of technology, overall the base variety of instructional media the students will encounter should give them a more motivating education experience even after the glow of the shiny new piece of hardware rubs off.

Applying social networks and the Internet in the classroom

One of the main advantages of the Internet in the classroom is that allows students and teachers more time to work on things that are important. The Internet and social networks allows students and teachers to interact and collaborate on any topic, anytime or anywhere. This interaction has many benefits, for example some software or apps can provide social networking that allows the sending and sharing of documents, calendars, and grades, and also homework among student, caregivers and other teachers. This type of sharing of information is obviously useful and a great time saving device, what might not be so obvious are the pedagogical benefits beyond efficiency. This type of sharing has two great benefits to students. First, it allows them to see the interconnectivity of their teacher's world, their world and the world outside the classroom. It will give the learner a meaningful appreciation of what others in the same situation are doing and allow a deeper reflection on their place in the learning process. Secondly, it brings the learner face-to-face with the power of the Internet to regulate their lives and bring meaningful change through interconnectivity. Related to this second point, it is important that students are international online citizens in the 21st century, and having a high amount of

online interconnectivity will support that goal. It is true to say that technology has changed society a lot and will continue to do so, students must able to navigate the future, which will include a heavy dose of technology.

Most homes these days have the Internet and some type of desktop, laptop, or mobile device. They provide an almost limitless supply of information and knowledge including: online lesson plans, education apps, interactive education games, online education videos and infographics, and PDFs. For these reasons, we must be aware of research into online learning and the use of technology in learning.

Conclusion

It is commonly said that instructors must be in control of technology, and that technology needs experienced skilled educators with well-developed theories and ideas about its application. However, it seems that technology itself can be used as a driver of educational ideas and classroom practice, not vice versa. This idea can be generally applied to many situations. As educators we tend to feel that the use of technology must be subsumed within current educational practice, or that it is a supplement to already existing classroom techniques, however, technology is a powerful tool to not only improve education around the margins but to drive real meaningful change.

Regardless of whether or not educators want to deal with developments in technology, that technology is entering classrooms at an increasing and ever more pervasive rate. This technology has come in many forms, and not only this, students are exposed to even more technology outside the classroom than they are inside it. Students engage with each other on social networking sites like Facebook and Twitter and it is fair to say that this is a type of technology and interaction that students find engaging (Davis, 2012). This is a particularly poignant point when many claim that one of the greatest challenges facing teachers is trying to get students to engage with learning contents (Shernoff, Csikszentmihalyi, Schneider, & Shernoff, 2003). As many formal places of learning in the developed world are becoming more standardized and banal, the only world that gives young learners a place where they can freely interact with a wide variety of materials and people is the online one. This contrast likely drives more learners away from traditional face-to-face modes of interaction and instruction and towards freer and more interesting online mediums (Davis, 2003).

As has been discussed in this paper, there has been limited change in the more than 100 years since Dewey wrote *My Pedagogic Creed* (1897*)*, and as this paper has argued, if these changes are to come, they need to be driven from outside the centers of traditional learning. There has been a limited amount of effort and effects from progressive educators to adapt the schooling environment to the new methods of schooling have been piecemeal and largely ineffective (Collins & Halverson, 2009).

A humanistic curriculum as proposed by Dewey, is the most effective way to develop learners for the 21ˢᵗ century. Learners of all ages need to be able to engage with a variety of types and levels of knowledge and create their own meaning of the world in which they live. Further to this point, learners themselves are different. This is the way in which education should seek to change learners. On the flip side, in a world of digital natives, education itself must not only change learners, it must also adapt to them. The learners of today require a more diverse nuanced and dynamic method of education than they are currently getting (Prensky, 2001).

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