The Role of Technology in Contemporary Education

By: Gloria Leung

Abstract

Technology advancement has caused a dramatic change in the learning environment. Many school boards in developed countries have embraced the use of various technologies in education, and incorporated them in their curricula. Many school administrators and teachers are under a conception that young generations are adept to technology and have undergone a fundamental change of fashion in learning. They believe that any technology that is used in education is welcomed by their students. While sometimes this conception may really be the case, many studies have proven otherwise. In addition, educators and administrators must focus on what role technology should be playing so that it can be implemented to benefit learners, and fortify pedagogy as a whole.

Technology is with us every day in almost every daily aspect. Our young generations are especially adept in employing various technologies in their daily lives. Prensky (2001a) coins the generation born between 1980 and 1994 the "digital natives", who are "living lives immersed in technology, surrounded by and using computers, video games, digital music players, video cams, cell phones, and all the other digital toys and tools of the digital age." Bennett, Maton & Kervin (2008) further depict that "young people of the digital native generation possess sophisticated knowledge and skills with information technologies” and have “particular learning preferences or styles that differ from earlier generation of students." Not surprisingly, technology is seriously treated as an important interface to reinforce pedagogy and engage youngsters in learning in school boards across many developed countries. This shift of learning fashion has raised one interesting question: Does technology really fortify pedagogy by engaging learners in learning?

To answer this question, considerations may be made to see whether the so-called “digital natives” are really technology-savvy, and whether there has been a fundamental change in students’ learning attitude, preference, and style due to technological progression. On one side of the coin, there is a generalization that young people are conversant with technology and proficient in multitasking. Prensky (2001a) comments that learning styles have
changed by claiming that "digital natives are accustomed to learning at high speed, making random connections, processing visual and dynamic information and learning through game-based activities." Brown (2000) furthers that "today’s kids are always 'multiprocessing' – they do several things simultaneously..." He suggests that "young people prefer discovery-based learning that allows them to explore and actively test their ideas and create knowledge.” Above arguments are endorsed by large scale surveys of teenagers' and children's use of the Internet conducted by Lenhart, Madden & Hitlin (2005) and Livingstone & Bober (2004). Those surveys reveal that many school-aged children engaged in a great deal of online activities, particularly for the purpose of working on their assignments and participating in social communication. Obviously, technological progression has in many ways caused a change in learning style for many learners, particularly the young ones.

On the other side of the coin, there are standpoints disavowing above perceptions. For instance, Kvavik, Caruso & Morgan conducted a research study in 2004, in which quantitative data were gathered from nearly 4,500 undergraduate students in regard to what types of information technology they had been using, the levels of skills they had possessed, and the general experience they had come across in using information technology. While the research revealed that a small percentage of these digital natives possessed some high levels of technical knowledge involved in academic and recreational activities using information technology, a significant proportion of the respondents had a lot lower skill level! The misconception that the generation of digital natives is overall skilful in information technology is further shattered by the research findings by Kennedy, Krause, Churchward & Gray (2006). Their research concludes that while students use a wide variety of technologies in their daily lives, "there are clearly areas where the use of and familiarity with technology-based tools are far from universal". In particular, their findings show that many variables, such as age, socio-economic status, and ethnic and cultural background influence students' use of technology and hence their skill levels. Downes (2002) ascribes this inconsistency of technology skills and experience within the same generation to factors such as family dynamics and the level of domestic affluence. Lee (2005) further offers the possibility that children's school and general home background also play a role in determining the level of technology use.

Certainly educational technologies have brought about positive aspects to both learning and teaching. For instance, teachers can publish course materials, instructions, as well as
feedback of assignments on a course website, hence making learners accessing such information faster and easier. Besides, computer-based instruction is also able to give instant feedback to students, hence encourage them to engage in learning more enthusiastically. Kulik & Kulik (1991) claim that "students usually learn more in less time when receiving computer-based instruction and they like classes more and develop more positive attitudes toward computers in computer-based classes." Prensky (2001a) and Tapscott (1998), in discussing technological development in education, argue that "educational institutions at all levels are rapidly becoming outdated and irrelevant, and that there is urgent need to change what is taught and how." There is also increasing concern that the old-fashion way of instructive teaching is obsolete to the generation of digital natives. For example, Prensky (2001a) asserts that "our students have changed radically. Today's students are no longer the people our educational system was designed to teach." Tapscott (1999) supports above argument and pushes for educators and authorities to “give students the tools, and they will be the single most important source of guidance on how to make their schools relevant and effective places to learn”. Other critics have also suggested that technological changes in conceptions and practices of literacy and pedagogy are necessary, or else our education system risk failing our students and our education institutions will become out-dated.

Based on above arguments, the urge for alterations for conceptions and practices of literacy and pedagogy is very obvious. However, questions must be raised as on whether these arguments are indeed justifiable. Kvavik et al. (2004) and Lohnes & Kinzer (2007) discover from their research in post-compulsory education that students do not really yearn for greater use of technology at school. The research by Downes (2002) corresponds to above discovery. Downes's findings reveal that home computer use is a lot more diversified than school computer use. Students prefer greater freedom and opportunity to experience learning by doing at home. In contrast, they feel that the ways how they would use the computer is constrained by the time limits and teacher-directed learning activities. Therefore, even if students are adept in using technology, it is doubtful whether they would want more technologies to be supplemented in school.

One thing that can be certain is that technology should not be merely devised to play a role of assistant in contemporary education. It must not be used to fill up vacant time, but must
be used to serve for meaningful purposes in both teaching and learning inside and outside the classroom.

In teaching, technology must be used to promote communications between teachers and students, enhance teaching practices, facilitate speedy feedback to students, deliver education materials efficiently, and above all, trigger students' high-level thinking and creativity. Torres (2009), for example, comments that educators have focused too much on how to implement certain technologies in schools, but have entirely missed out the point of trying to make use of various technologies so that they facilitate and reinforce students' creativity. In learning, it is essential that technology is devised to stimulate students' curiosity in pursuing knowledge, fortify collaborative learning environments, encourage hands-on experience for students, and entice students to learn enthusiastically. Iyer (2007) asserts that technology should be used in a way to shift the identities of students from "passive to proactive learners." In short, technology is playing multiple roles in contemporary education.

Another important point that should be noted is that technological progression is an inevitable phenomenon. It has impacted how people interact with each other in societies. It has also reshaped people's behaviours, points of views, and attitudes to various extents. Within the scope of education, technology transformation has influenced both learning and teaching. Its existing and future functions must be treated seriously, carefully, and above all, rationally.

Without a doubt, to better pedagogy as a whole, integrating technology to curricula is necessary and unavoidable. However, integration alone is not sufficient! What role technology should play in contemporary education must therefore not be determined by some random probabilities, but decided by collaborative efforts and meticulous planning contributed by administrators, teachers, educators, and parents in order to achieve the various functional roles such as the aforementioned ones.

Finally, when deciding what role technology should play on contemporary education, it is imperative for administrators and educators to realise the dynamic nature of education. A dynamic phenomenon evolves over time, and is influenced by many variables. Therefore, as important as it can be, technology is not the only factor that is reshaping pedagogy. As such, although technology is able to play a vital role in contemporary education, at the same time educators and administrators must also pay attention to other influential variables, such as people's attitude and government's policy towards education, emergence of new teaching
methods and practices, development of new learning theories, cultural changes, and so on. From time to time the role of technology in education must be revisited so that it suits the ever-changing nature of the cultural and social context in education.
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