Is Technology the solution to effective Pedagogy? A Constructivist Perspective

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Abstract

Technology has extensively interfaced with society in terms of interaction, collaboration, communication, information and resource sharing. Technology in education context makes learning more of student-centered approach; practical, collaborative, interactive and interesting. Mobile technology is now trending particularly with students because it is a digital technological resource that is affordable, wearable, and portable and facilitates teaching and learning. Historically, learning with technology has its origin from the constructivist school of thought which hinges on two constructs: 1. Learning by interaction with others to compare and share ideas and 2. Performing authentic activities that depicts real life situations (modelling). Vygotsky, a constructive theorist sees learning as an interactive engagement between the learner and the instructor. Vygotsky believes teaching can become more effective if teachers engage more in interactive teaching with efficient use of digital technology.

1. Introduction

Technology, the application of scientific knowledge and skills for practical ends, has transformed humanity throughout history. Technology in the form of computers, cellular phones, iPads and most importantly the internet have completely overhauled the 21st century society in terms of the way people interact in society and the way teachers teach in schools. And society seems to be fascinated by the eruption of technological advancement in education. This gives teachers and students the opportunity to learn from different perspectives. Technology integration in schools is nonnegotiable due to its high demand as a requirement for employment as well as a "lifeline" in our technology savvy world. Just as there are always three perspectives to every narrative, technology is not an exception. However, this essay tends to look at the narrative in line with positive use of technology. The focus of the narrative will be on the shift from technology to the pedagogy of use and this will review technology as a pedagogical tool for teaching and learning.

2. Discussion

Pedagogy basically, is the theory and practice of teaching or simply, the approach of teaching, and it depends extensively on three fundamental concepts: information, communication and interaction. In the past, information was communicated through friends, printed books or audiovisual materials. However, rapid developments in technology or Information, Communication and Technology (ICT) has revolutionize the mode of information dissemination: And this has changed society in terms of interaction, communication, and resource sharing. Digital technology and specifically Web 2.0 technology is the current trend of technology application being used in all sectors including banking (Economist, 2002), health (Kenny et. al., 2012), and education (Ally & Tsinakos, 2014). Web 2.0 technology is becoming a pedagogical resource for effective teaching and learning because it is more interactive and makes teaching more practical and interesting (Manca & Ranieri, 2013). It has also become an effective ubiquitous tool for teaching and learning because it makes the learner have easy access to information anywhere and anytime (Sharples, 2000).

In the context of education however, technology has acquired several names during the last decade, such as mobile learning (m-Learning), Technology enhanced learning (TEL), online learning (o-Learning), digital pedagogy (DP), electronic-Learning (e-Learning), virtual Learning (v-Learning), ubiquitous learning (u- Learning), and blended learning (b-Learning). This basically are terms used to categorize technology as a pedagogical tool in teaching and learning based on the context and concept. Thus making learning more of student-centered approach which is more practical, collaborative, interactive and

interesting (Kaplan & Haenlein, 2010; Allen 2012; Greenhow et al., 2014; Manca & Ranieri 2013; Rodríguez-Hoyos et al., 2015).

M-technology or smart technology is a trending digital technology particularly with students because it is affordable, wearable, portable and interactive, thus facilitates teaching and learning. ((Romrell, Kidder, & Wood, 2014). It includes tablets, iPads and Smartphones (Romrell, Kidder, & Wood, 2014) which students as well as teachers can carry anywhere and anytime (Melhuish & Falloon, 2010). Mobile technologies therefore afford the users the ability to learn with fun and interaction at any place and any time (Crescente & Lee, 2011).

Historically however, learning with technology has its origin from constructivist school of thought which hinges on two constructs: 1. Learning by interaction with others to compare and share ideas and 2. Performing authenthic activities that depicts real life situations (modelling). Constructivism is an epistemology or a learning theory that basically says that people construct their own understanding and knowledge of the world through experiencing things and reflecting on their experiences. Lev Vygotsky, (1978), a major proponent to the constructivist learning theory, views learning from sociocultural perspective. He proposes that culture is a major influence on learning (Taylor & MacKenney, 2008). That culture provides both the information and the process (e.g. Classroom) for learning to take place (Woolfolk, 2001). Culture also determines our access to tools both real (e.g. Smartphones, web 2.0 apps) and symbolic (e.g. Alphabets, numbers) which directly facilitate critical thinking (Woolfolk, 2001). Vygotsky sees learning to occur in a Zone of Proximal Development, which is a space between what learners are able to do independently and what they can do through interactions with a teacher or peers or technology within a supportive learning environment such as technology-enhanced learning environment (Alexander & Winne, 2006). In this case, the learner with no experience is scaffold by a teacher or experienced peers or even by technology-enhanced learning application to attain his optimum potential within the Zone of Proximal Development. Vygotsky emphasizes that teachers should adopt interactive approach to teaching by using more technology-enhanced learning resources which make learning interesting and effective.

3. Conclusion

Digital pedagogy has helped to mitigate a major problem that previously confronted STEM (Science, Technology, Engineering and Math) education and this include complains by students that science teaching is boring; theoretical, abstract, repetitive and non- relevant (Osborne et al., 2003; European Commission, 2007; Tytler, 2007; Abel & Lederman, 2007). Similarly, in a study by Teppo and Rannikmäe (2008), which shows that students in developed countries, have low motivation towards learning science, especially chemistry and physics because teaching is not interactive. Technology is therefore a game-changer in the education sector. It has made teaching and learning more interactive, effective, affordable, accessible and available to all irrespective of time and space.

Finally, from Vygotsky's theoretical perspective, effective teaching and learning can only be achieved through responsible, purposeful and effective application of technology.

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