

Promoting Using Technology to Teachers

Literature Review

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By

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### **Introduction**

On Oct. 23rd in 2019, in the paper published in the science journal Nature, a group of scientists made amazing progress in the technology that the new processor takes about 200 seconds to do a certain task which the traditional supercomputer would take approximately 10,000 years (Arute et al., 2019). This exciting news shows that technology is developing so fast that educators and students must face the challenges which come along with the advanced high tech. Therefore, innovation and technology must be promoted and practiced with great vigor (Mullen, 2010). In this literature review, the author would like to encourage and support teachers to adopt technology more frequently.

This work is important because teachers do not have time to research and learn how to use the technology themselves even though they have been aware that it can motivate and greatly engage the students. It is a common problem that teachers do not know how to use computers or tablets to support students' learning, so some school labs and equipment are seldom used, which is a waste of resources. About one-third of teachers said they did not use or practically never used a technology product in the school in the Common Sense Census report by Vega and Robb (2019). This puts these schools at risk of losing funding for future advancements in technology in the long run due to this lack of usage. To address the above, this research-based study can save teachers' time and facilitate them about the pros and cons of utilizing internet-based devices and multimedia.

The purpose of this literature review is to review literature related to the use of technology in the teaching practice to support teachers' Professional Development (PD). The goal of the review is to provide the advantages and disadvantages of using technology in the classroom. Then teachers can better master technology applications in the classroom and the students will be well trained to be creative and more likely to be ready for the 21st-century challenges.

### **Literature Review**

The literature review will be organized with terms, theoretical framework, definitions of terms, advantages, challenges plus disadvantages, and a conclusion. The review will begin by offering definitions of the terms that readers need to know. The theoretical framework will be stated, then a summary of positive and negative impact of using technology following by a conclusion .

### **Definition of Terms**

To facilitate the understanding of language that the author uses in this paper, here are the definitions of terms as follows.

Creativity- The ability to use skill and imagination to produce something new or to produce art; the act of doing this ("Definition of creativity noun", n.d.).

HyperDoc - A term used to describe a web-based document that contains an innovative lesson plan for students to enhance 21st-century skills ("An Educator's Guide to the 'Four Cs'," n.d.).

Four Cs - Four specific skills are the most important in the “Framework for 21st Century Skills” and they are critical thinking, communication, collaboration, and creativity (“An Educator’s Guide to the ‘Four Cs’,” n.d.).

### **Theoretical Framework**

Adopting technology in the education context uses social constructivism and cultural history theory. First, social constructivism comes from constructivism. Learners construct new knowledge through social interaction with others, either personally or through multimedia. (Spector, Merrill, Elen, & Bishop, 2014). Most technology makes communication and interaction much more easily and timely so in this process trainees are going to learn how to use technology from a great deal of practice communicating with peers and instructors. Therefore, it applies social constructivism.

Second, similar to social constructivism, cultural history theory is applied in the use of technology as well. Lev Vygotsky is the founder of cultural-history theory. His well-known words “the mind grows through interaction with other minds” (Spector, et al., 2014, p.25). An old Chinese saying that two heads are better than one, which also shows the importance of interaction and collaboration. When teachers adopt technology they are going to develop their digital literacy by interacting between the individuals and the online community as a virtual society. Thus, this adopts cultural history theory.

### **Advantage of using technology in the classroom**

Literature suggests that various technology can empower learners with improved performance and personal skills, save time and money, as well as develop and teach creativity one of “Four Cs” for 21st Century Skills: critical thinking, communication, collaboration, and creativity by National Education Association (NEA) (“An Educator’s Guide to the ‘Four Cs’ ”, n.d.).

**First advantage.** Alqahtani and Mohammad (2015) state that learning through technology devices such as smart phones can improve learners’ performance and personal skills. In addition, they also note that mobile learning can enhance skills such as communication and problem-solving. Performance can be enhanced as long as there is some interaction between learners and the cellphone application (Hamdan & Ben-Chabane, 2013).

**Second advantage.** Allessi and Trolip (2001) say that computer-based instruction reduces learning time. Technology makes learning into and beyond the classroom, no longer restrained by fixed schedule or physical spaces for instruction, saving lots of commute time and increasing motivation (Carlson & Gadio, 2002). Additionally, learning materials can be delivered much more easily and cheaply. For example, the reading text can be shared on Google Drive, where learners can download and read at a convenient time and location.

**Third advantage.** Utilizing technology can develop creativity and teach creativity. Henriksen, Mishra and Fisser (2016) state that there are two important aspects to the role of technology and creativity in the classroom. First is that educators must be creative in inventing new ways of how to utilize technology in the education context. Most digital tools such as Facebook, Google Doc, a smart phone or tablet have not been created for educational purposes. Therefore, teachers should creatively use all sorts of tools for teaching. For example, Lisa Highfill, Kelly

Hilton and Sarah Landis cocreated HyperDoc, a transformative interactive web-based lesson plan, a great example of using the technology to TEACH creativity and promoting digital collaboration and creation (“About the HyperDoc”, n.d.). Secondly, technologies provide new ways of shaping all the steps and behaviors in the teaching and learning process such as engaging, communicating, reflecting and so on (Henriksen et al., 2016).

### **Challenges and disadvantages of using technology in the classroom**

Literature also shows that when using technology, teachers face challenges such as lacking of enough technical support and adequate training. In addition, the disadvantages of using high tech in education are to dehumanize teaching and drive students to distraction.

1. The obvious challenge for teachers to adopt high tech is to lack enough technical support and adequate training in the Common Sense Census report (Vega & Robb, 2019). Also, in the report, only 40 percent of teachers claim that the PD they take to support their use of educational technology to be “very” effective. Without appropriate training, the hardware and software sometimes are difficult to be controlled which makes teachers prepare plan B or even bring a negative impact on teaching. What is more, when the computer or other device is broken, teachers have to wait a long time for the only technical colleague to come to help.

2. Next, some educators have claimed that technology has disadvantages in the classroom. One of them is that Heinich et al. (1993) said teachers have to be aware that students should be treated as humans instead of machines. Mantiri (2014) points out that teachers

should pay attention that students own rights, emotion and inspirations, and should be treated as such with or without the use of technology.

3. The use of digital technology can be a distraction “that negatively impacts students’ classroom performance” (Langford et al., 2016, p.2). Langford also indicates the example of distraction is that students try to do multiple tasks at the same time, which breaks the concentration on the subjective matter and leads to low GPA. What is worse is that students might use social media for non-study purpose and become addicted to it.

### **Conclusion**

Technology can play an important role in the classroom. This study is important because it offers advantages and disadvantages to educators who would like to learn and apply technology. Therefore, then teachers have more time to focus on designing curriculum with technology integration. Even though teachers face challenges such as lacking effective training and technical support, technology can dehumanize teaching and drive digital distraction, there are advantages such as improving performance, saving time and money and develop creativity. Further study is needed to think about and plan how high tech can be utilized to support learning, or how to use different kinds of technology for a certain subject teaching to make the most of the advantages and decrease the negative impact of technology.

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