

Transformative technologies in education



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In his famous paper *Digital Natives Digital Immigrants*, Marc Prensky (2001) argues that in light of the rapid dissemination of digital technologies in the last decades educators must create online, interactive and digital learning opportunities for their students.

Many researchers find this work contentious – discuss and evaluate this concept (including reference to the unit literature and additional research-based materials).

From the last two decades, digital technologies have been put to question as to whether its stimulus is beneficial to classroom environment. Its use in various other industries for increasing their performance and growth have expanded. More specifically in this case, the education field's advances in technological research and implementation of digital technologies. The aim, to utilise the benefits to the nature of learning and teaching. This paper, will approach to evaluate and entail the benefits and risks associated the use of technologies have on learning and teaching in schools and communities. Highlight information regarding critical thinking skills required as learner in this digital age, and describe the influence of role of educators to arrive at inferences and conclusions.

The use of digital technologies in education, exposes risks and potential benefits to the learning process of students, teachers and communities. To critically access the influence of digital technologies in the classroom, an understanding of the relationship between technology and daily social life of people needs to be established. The interdependent and instrumental

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relationship, relies on co-evolving mechanisms. It is interdependent in how we use it to advance and elevate human experience. For example, digital technologies are currently in use for the management of student's information and measurement of performance through information systems (IS). ' It can use ERP system for various things, such as attendance, timetable, and registrations' (Renard, 2019). Prior to this systems were more manual adoptions. This interdependent relationship through research and establishing potential benefits serve to create a more organized environment to execute educational and learning outcomes of students and curriculum more productively, timely and effectively. Secondly, the instrumental relationship exposes the purpose of technological use. It serves a means to an end. Although it is controlled by humans for an outcome, technology is neutral in that it cannot exist without us and we cannot survive without technology. The digital age is defined and characterized by this relationship and how we decide to reduce unintended consequences and utilize the benefits to increase human performance, quality of life, process of learning as teachers and learners for individual and collective growth. ' By technology we typically mean the knowledge and instruments that humans use to accomplish the purpose of life'. (R. Friedel, 2007).

This understanding of the relationship in regards to the Australian curriculum realizes the crucial need to access and guide classroom use. In terms of Australian curriculum, there is a divisive emphasis on digital technologies involvement in the classroom, which arise as opposing perspectives to the use of technology for learning. For example Simon Birmingham the Federal minister of Education proposes, ' classroom time is for learning, not to be

distracted by learning'. This digital age offers a sense of universal togetherness. Students place their social life, communication process and personal curiosity at forefront of the global mechanism of digital technologies. Being a primary socializing and instrumental influence in the lives of these young people, ' It should be possible for young people to grow up digitally in a protected and supported environment, which minimizes risks while building important skills for life in the digital world' (Henderson & Romeo 2015). To illustrate, it is proposed that due to the growing extensive relationship, it is necessary for the Australian curriculum to adopt ' mandating the effective integration of digital technologies as a general capability for all students foundations to year 10' (Henderson & Romeo 2015).

Content knowledge and digital technologies are central to many contemporary educational curriculums. As a central aspect, this has the benefits of enhancing and shaping collaboration, creativity and communication. For example, the Australian educational curriculum ' encourages students to apply their knowledge and practice skills when using technologies, to create innovative solutions independently and collaboratively to meet current and future needs'. (AGARA, 2014, P. 1)

(TPACK), a model for learners and teachers, places fundamentally Technological, Pedagogical and content knowledge as 3 core components for design thinking process of classroom. A broad example to foster visualization, communication and creativity may be with engaging students in a Historical assignment where Virtual Reality (VR) is utilized to show an accurate representation of the War front of Australia, its social and

political climate during its involvement in the Vietnam War. ‘ There are some other tools for learning as well, such as augmented reality’. (Walsh, 2013).

Pedagogy can be used as a criterion for learning, which makes huge impact on learning and teaching. There are various types of pedagogical approaches for learning and teaching. In addition, predominant approach has used for learning, which is didactic in nature. Technologies make learning easy for teachers and students. However, traditional approaches can be used in the technologies for teaching (Bright, 2015). Tied to content knowledge, which is necessary for learning from technology. The Just in time approach, precisely based on a TPACK design thinking acts to encourage more authentic learning environments founded in the c-evolving relationship of learners and technology. Just in time teaching looks to cancel out the tradition classroom. Based on socio-cultural learning theory, children actively construct meaning of and knowledge. The emphasis is that knowledge is not collected but constructed through interaction. Just in time teaching, allows students to explore prior class specific set out videos and readings to construct an informative understanding prior class. According to the National Research council, all new learning depends on learner’s prior knowledge and current state of understanding. This allows the teacher to create and interactive classroom environment where knowledge can be constructed, interpreted and situated through TPACK design processes. For example, a TPACK and Just in time classroom design, sets a task to students of watching an online video about The Immigration Restriction Act of 1901 and gather 10 facts about a Historical character in Australia’s history during Federation 1901 based on a prompt. With knowledge of these facts and content knowledge

prior class. This allows the teacher to plan an interactive and technology based activity which fosters visualization, collaboration and creativity. For example, a collaborative task using twitter will allow students to pick a historical figure and create an account under that name. The lesson will be based on a prompt question. ‘ How should the colonies of Australia decide on immigration legislation?’ The task is to have students interacting with their prior knowledge, delve collaboratively in an online discussion and environment, the discourse of the first immigration act for Australia. Through this design thinking process of TPACK in a history classroom example, learners become ‘ successful learners, confident and creative individuals and active informed citizens’. (MCEETYA, 2008, P. 7). This approach to digital technologies emphasizes collaboration, creativity and visualization and self-directed learning. As an educator who facilitates the learning process with feedback and guidance. ‘ Students learn to value the diversity of learning and communication styles’. (ACARA, 2013, P. 79).

Educators, who facilitate learning process of TPACK as model for planning class forces educators to become crucial examiners of technologies used in the classroom. ‘ TPACK engages capabilities of teachers to identify, design, implement, analyses, manage and critically reflect upon changes in curriculum, pedagogy, assessment and technologies throughout becoming professional’ (Henderson & Romeo 2015). From this stage, the primary role is to identify potential barriers to using digital technologies. ‘ Primary obstacles include lack of access to computers and inadequate technical and administrative support’. (Ertmer, 1999, p. 48) Teachers can now consider their approach to learning outcomes and use of digital technologies

dependent on 'school or system wide barriers'. (Henderson & Romeo 2015). The role of a teacher with a model such as TPACK and design thinking executed through either Just in time teaching or flipped classrooms, exhibits the constant re-evaluation of personal skills such as design, analyse, manage, and planning needed to provide the standard of educational outcomes set by the Australian curriculum. An example of teaching in a school which lack ICT equipment. M-learning, also known as mobile learning can also be introduced through designing a TPACK plan according to learning outcomes. Mobile learning is the principle of mobility that differentiates computer classroom work. For instance, 'the teacher might ask the students to leave the classroom, walk around the local area, identify historical building and photographs' (Henderson & Romeo 2015). This make it possible for the educator can facilitate an environment where collective learning and collaboration can occur by forming a discussion page for students to share work progress and annotations. 'Students are moving feed directly into their learning, ensuring that their construction of understanding is situated and embodied' (Henderson & Romeo 2015).

These forms of teaching and learning explored throughout this paper, highlight that through the implementation and execution of learning outcomes with digital technologies. Teachers, learners and wider community create a cohesive learning sequence. This sequence makes learning interactive, authentic in that it creates a bridge between the real world and classroom. Provides opportunities to understand education and learning as natural processes based on growth and curiosity. This authenticity of education becomes apparent through TPACK as it takes advantage of critical

thinking, communications, collaboration and creativity as essential tools in a designed learning plan and according to the Australian curriculum.

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