

# Technology in the 21st Century Classroom.docx

*by* Charmen Watkis

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TIME SUBMITTED	06-MAR-2017 01:12AM	WORD COUNT	4011
SUBMISSION ID	779697741	CHARACTER COUNT	21985

## Technology in the Classroom: Effective Engagement in the 21<sup>st</sup> Century.

### Introduction

#### Problem Statement

Is Information and Communication Technology (ICT) the answer to the quest for successful engagement of learners in the 21<sup>st</sup> century classroom? Educators struggle with this reality on a daily basis as the society is inundated and preoccupied with the new technologies. ’

Smartphones, computers, videogames, digital music players, video cams, and all the other toys and tools of the digital age’ (Prensky, 2001) are a part of the new technology.

According to, The Top 15 Most Popular Social Sites (2017), the five top ones are Facebook, You Tube, Twitter, Linked In and Pinterest. Facebook and You Tube get over 1 billion unique monthly visitors. The other most popular social sites boast millions of monthly visitors ranging from the lowest of the 15, Classmates, at 15,000 and LinkedIn at 225,000,000.

#### What is engagement?

According to Zepke, N., and Leach, L. (2010), Chapman (2003) defined engagement as ’students cognitive investment in, active participation in and emotional commitment to their learning. The Australian Council of Educational Research proposed another view which stated that engagement has to do with ’students’ involvement with activities and conditions likely to generate high quality learning’ (ACER, 2008: vi). Students need to be meeting the school’s expectations as well as their own expectations in order to experience this level of engagement.

#### Who makes up today’s classroom?

Globally, users of the internet and computers can access information more readily than any other generation has seen. Generally, our youngest generation is most fluent with the technology, but the older generations whether willingly or unwillingly are a part of this learning experience. The young and older people are now open to a wider sphere of knowledge and especially the older generations can go back to school without entering a physical classroom or attend both online and offline classes.

### The Primary Generations

The Centre for Generational Kinetics (2017) lists the primary generations that exist today as the iGen, Gen Z or Centennials who were born in 1996 and after, the millennials or Gen Y who were born between 1977 and 1995. Generation X spans 1965 to 1976 while the Baby Boomers age started in 1946 and ended in 1964. Before the Baby Boomers the Traditionalists or Silent Generation existed. It is interesting to note that developments in technology, such as the internet and computers, facilitate learners of all age, nationality, race, financial status, language and currency.

### The Benefits of ICT in education

This phenomenon, as seen in the work of many proponents of the use of technology in education, can open a new door to how students are taught as their focus is on the technology. There is much debate on the effectiveness of the new technologies in the classroom. New technologies are highly operational in the workplace, but the educational sector is slow in embracing the power of the technology.

For the educational landscape, ICT can be beneficial in areas such as, labour-technological, community (interpersonal) and transpersonal education. Examples of labour-technological education can be seen when an instructor engages students to the point where they develop expertise in areas such as 'arts and crafts, logic and mathematics, engineering, natural, social and behavioural sciences' Ager, R. (2003) p.20.

'A new kind of school is needed for the 21<sup>st</sup> century' is a view that Ager (2012) articulated. The quality of school life will not change unless other stakeholders in education, such as, the politicians, educators and other members of the society unite to raise the standard again in schools.

### The Benefits of ICT in Industry

Ager, R. (2003), in his mindcraft economy, posits that sectors such as agriculture, manufacturing and service are joined by another sector called the knowledge sector. Mental work is now automated and many tasks get done at a faster pace than humanly possible. This is seen in many

paper-generated jobs, such as accounting, secretarial and inventory control. The knowledge and information created is quickly exchanged, shared and communicated.

The rise in the service industries across the world attest to this emergence. This good for the service jobs, but bad for workers who are labour-intensive. Attendants such as at the airports and cashiers are experiencing redefined job descriptions as artificial intelligence is taking over the globe. Computers do get the job done quickly and automatically, but so many people will lose jobs as a result of them replacing much of the human element.

As globalization continues, Ager, R. (2003), the manufacturing and even some service industries have closed down in the developed countries and have moved to underdeveloped countries where the cost of labour is usually cheaper and at times the quality is higher than in the developed countries due to the financial need that exists with these less developed countries. In many countries I have heard of and seen on the news where many factories in the agricultural sector have closed their doors due to high operational costs. Businesses cannot just break even or incur losses as profit is what keeps a business afloat.

Ager (2003) cited another problem with the use of ICT and it has to do with the uneven distribution of wealth which give rise to poverty, hunger and illiteracy. These ills are long-standing issues with the underdeveloped countries, but sadly, people in many sectors of the developed world are presently experiencing deep pain and hardship due to lack of jobs or they are given added responsibilities at work where they are doing two or three persons work for the same pay or just a stipend above their former pay.

As a people we like comfort and the new technologies offer much comfort but comes with a cost of loss of manual jobs. We have to be careful that we do not become selfish in looking out for our own needs at the expense of seeing our fellow countrymen and brothers and sisters worldwide suffer. We should be actively seeking out the needs of others and especially if the need stares us in the face, we should respond graciously as we may be on the other side of the fence one day.

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Like Ager, Prensky is of the view that a new kind of classroom is needed for the 21<sup>st</sup> century. Ager seemed to have great concern about the decline in morality in school life. Prensky's focus is on the way educators transmit knowledge to learners of this age especially those he refers to as

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'digital natives'. 'Today's students are no longer the people our educational system was designed to teach', Prensky (2001).

Prensky is probably the main proponent of digital technology in the classroom. He believes that digital natives are the youngest generation who are called Generation Z and IGen in other quarters. (Prensky, 2001) advocated that the current average college graduates 'have spent less than 5,000 hours of their lives reading, but over 10,000 hours playing video games (not to mention 20,000 hours watching TV). Computer games, email, the Internet, cell phones and instant messaging are integral parts of their lives'. This is why Prensky believes that educators who he refers to as, digital immigrants, should take advantage of the natives' computing language by teaching them in that language. By doing this educators will fast track 'instruction, and to provide random access' (Prensky, 2001a, p. 4 [print]; ¶ 11 [online]).

That is a goal worth achieving but many challenges are on this road for educators. Some of these challenges are easier to overcome than some.

### Digital Immigrants

Earlier generations to the natives, such as, Generation X, Baby Boomers and The Silent Generation are not as adept to the technology as 'the natives' in Prensky's view. This view is supported by academics and non-academics because this fact is ubiquitous. Digital immigrants are those people who try to learn the new technology. Some immigrants master most aspects of the technology while some know just enough to survive. Digital immigrants will always show their 'accent' according to Prensky, which becomes evident when the immigrant uses the internet as a secondary source of information rather than the primary one, as the digital natives would do. Prensky posits that a digital immigrant would read a manual while a native would depend on the programme to teach how it should be done.

For Prensky, the divide between the immigrants and the natives will remain, because the immigrants are socialized differently from the natives because their brains have developed certain pathways which put both sides at opposite ends, such as, the Northpole and SouthPole. Digital immigrants do not generally learn at the fast pace that these natives go, but the technology is here to stay, so many educators take short courses in ICT in an effort to bridge the gap with the natives.

Many educators who are not ICT teachers will confess that at times these digital natives help to resolve some of the technological issues during class time.

In *Digital Natives, Digital Immigrants Part 2*: Prensky changed his view that digital immigrants will never become as competent at the technology as the natives.

The traditional view is that by the age of 3 the human brain does not change physically based on outside stimulation. Today, research in neurobiology shows new evidence that the brain structures are constantly changing based on different types of stimulation so transformations continue throughout one's lifespan. *Educators and teachers with the right type of support system can be amply prepared to engage digital natives in their cyber language.*

Manipulating the new technologies seem automatic and inherent for these young 'natives' as they are exposed to Information and Communication Technology (ICT) before birth and after. Their parents, who can be from any of the other four generations, have been exposed to the new technologies that have been coming on stream especially in the workplace and social media. Due to the 'natives' apparent expertise in technology, Prensky has been a firm advocator of teachers or educators who he considers to be digital immigrants to actively find ways to bridge the generation gaps especially in the area of technology.

I share Timothy Vanslyke's view that although there may be a generational gap between teachers or educators, that is, the immigrants and the natives who are today's students, this gap can be closed due to the brain developing new pathways which open doors for Generation X and beyond 'to learn new tricks'. The digital immigrant should learn more technology but the native can also learn more about analog technologies in order to bridge the gap on both sides.

<sup>2</sup> Prensky argues for a new way of looking at educational content as well. A category that he calls "legacy content" consists of traditional subjects such as reading, writing, and logical thinking. "Future content" is "digital and technological," including such subjects as "software, hardware, robotics, nanotechnology, genomics, etc." as well as the "ethics, politics, sociology, languages and other things that go with them" (2001a, p. 5 [print]; ¶ 21 [online]). Prensky's is a strong believer in edutainment. Personally I believe edutainment has its place in the classroom where it can engage many students to the point where they escape their realities, for example those who

are experiencing great levels of stress or reinforce certain keypoints while having fun. Research shows that people learn best when they do not feel pressured and is at ease with their environment.

Vanslyke stated that Prensky has expressed that "My own preference for teaching Digital Natives is to invent computer games to do the job, even for the most serious content" (2001a, p. 5 [print]; ¶ 24 [online]). According to Prensky, virtually all content can be taught in this way. He believes that it is . . . just dumb (and lazy) of educators—not to mention ineffective—to presume that (despite their traditions) the Digital Immigrant way is the *only* way to teach, and that the Digital Natives' "language" is not as capable as their own of encompassing any and every idea. (2001a, p. 6 [print]; ¶ 33 [online])

Educators owe it to all their students to meet their needs as best as is humanly possible. Some teachers may be lazy and ineffective, but I believe that they should try to learn new skills, such as computer skills, management skills, decorating skills or whatever is necessary to get the job done in this noble profession. We should build on our strengths and correct our weaknesses in order to prepare students for the 21st century workplace.

Are there other factors that are less, equally or more important than the emphasis of ICT?

Koehler, Mishra (2009) stated that "effective teaching depends on flexible access to rich, well-organized and integrated knowledge from different domains (Glaser, 1984; Putnam & Borko, 2000; Sulman, 1986, 1987), including knowledge of student thinking and learning, knowledge of subject matter, and increasingly, knowledge of technology.

Applying a model of ICT in the classroom demands a certain level of expertise which most teachers do not have as they are not familiar with the technology as the manufacturing and other sectors. Cost is also another factor that face some educators in mastering the technology. The time to educate yourself is also a real issue for some teachers as their workload is rigid and enormous', Koehler, Mishra (2009)

"Most traditional pedagogical technologies are characterized by specificity (a pencil is for writing, while a microscope is for viewing small objects); stability (pencils, pendulums, and chalkboards have not changed a great deal over time); and transparency of function (the inner

1 workings of the pencil or the pendulum are simple and directly related to their function) (Simon, 1969). Over time, these technologies achieve a transparency of perception (Bruce & Hogan, 1998); they become commonplace and, in most cases, are not even considered to be technologies.

Digital technologies such as computers, handheld devices, and software applications by contrast, are protean (usable in many different ways; Papert, 1980); unstable (rapidly changing); and opaque (the inner workings are hidden from users; Turkle, 1995). On an academic level, it is easy to argue that a pencil and a software simulation are both technologies. The latter, however, is qualitatively different in that its functioning is more opaque to teachers and offers fundamentally less stability than more traditional technologies. By their very nature, newer digital technologies, which are protean, unstable, and opaque, present new challenges to teachers who are struggling to use more technology in their teaching’.

Koehler, Mishra (2009) are definitely more sympathetic to the realities of educators and teachers generally, because there are ICT teachers who are very conversant with the technology. The TPACK framework was developed by Koehler and Mishra on Shulman’s (1987, 1986) descriptions of PCK. TPACK

8 means Technology Pedagogy Content Knowledge. PCK is a shortened form for Pedagogy Content Knowledge. Content Knowledge (CK), is the knowledge that the teacher has of the subject. If a teacher does not know his content sufficiently, this can cause misconceptions among students and is very bad for the morale of both teacher and students. Inaccuracies in course content can even become a legal matter, Koehler, Mishra (2009).

The TPACK 1 framework has four domains and educators need to develop expertise in all four areas so that ‘deep, flexible, pragmatic and nuanced understanding of teaching with technology in each of these areas as well as in the areas in which they interrelate. As we see here, the technology does not work by itself. The educator needs to know good pedagogical skills and how to use them as well as content knowledge and how to use it.



Zepke, N., and Leach, J. (2010) after extensive research on the topic of 'engagement' in ten countries outlines ten proposals for action.

1. **Enhance students' self-belief** — Students are usually more engaged when they choose to be involved in the lesson in order to achieve some personal goal. This comes with a belief that they have the ability to succeed and overcome obstacles which is evident in their confidence and commitment to learning.
2. **Enable students to work autonomously, enjoy learning relationships with others, and feel they are competent to achieve their own objectives.**
3. **Recognize that teaching and teachers are central to engagement.** A teacher who is sensitive to the concerns of students and competent provides great encouragement to students to maximize the learning experience and share opinions as well (p. 170).
4. **Create learning that is active, collaborative, and fosters learning relationships** (p. 171).
5. **Create educational experiences for students that are challenging and enriching and that extend their academic abilities.** Students appreciate challenging but doable exercises that make them think creatively.
6. **Ensure that institutional cultures are welcoming to students from diverse backgrounds.** When students feel accepted and included they relax and perform at a high level.
7. **Invest in a variety of support services.** Support services offer students the chance to have a body to go to for advice and help. Students take a mental note that the school cares about their holistic education.

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**8. Adapt to changing student expectations.** Educators and administrators should keep working at meeting and exceeding the expectations of students.

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**9. Enable students to become active citizens.** The goal of teaching is not only for academic success, but also to produce active members of society (p. 173).

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**10. Enable students to develop their social and cultural capital** — this kind of capital derives from a sense of belonging, from active relationships with others, and from knowing how things work around the institution. It is especially essential for minority students who need to be successful not only in the classroom but beyond it as well.

### Theories of Learning

#### The Flipped Approach

This approach is different from the conventional approach where the lesson is taught and then students are given homework on what was taught. With the Flipped Approach students are given websites to look at or content to read before the lesson is taught and discussed. This leads to better discussions based on what students know and do not know.

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Use of Bloom's domain, 'applying'

#### Cooperative Learning

Cooperative learning is a concept borne out in Bloom's taxonomy. Learners are placed in small groups to solve problems given by the teacher. These problems have definite answers, so brainstorming as a group can be very fruitful.

#### Collaborative Learning

This approach to learning is similar to cooperative learning, but the difference is that the questions that the teacher give may not have definite answers. The teacher may just want to provoke deep thinking among students

Recommendations?

This is where the administration of an institution and other stake holders in the society including the government can prove helpful. Administrators can arrange group training sessions for teachers with experts in ICT. These experts should be available to answer questions even after the course is completed so that the information is cemented. There should be middle managers that are put in place to see that the system is maintained properly and that teachers really are growing in handling the technology.

Teachers can also learn from peers who are more skilled in the area. Peer help even in the classroom helps significantly. Teachers practicing their use of the technology by preparing challenging work for students to keep them active and engaged.

Some students do not have access to computers based on their geographical region and affordability. Mitra (1999) recommends that the government or other stakeholders provide free access to computer for learning for underprivileged children and communities.

What are the implications for practice/theory/policy?

When educators are very clear in their minds that engaging students successfully is not all about become more skilled at technology, but includes it's skilful use they will free themselves from the frustrations of feeling like an ill-fit in the classroom. Many traditional methods can be amended in game form to capture the attention of students. Students like to test their teachers and are usually very impressed and feel safe when their teacher know the content and can transmit this information appropriately (pedagogic skills).

Classroom behaviour issues are minimal when students feel challenged and engaged with a topic that is packaged in a way to hold their attention. They will volunteer instead of waiting on their turn to answer a question or make a comment. Classroom behaviour management is a crucial point for many teachers as students of this generation are generally not as well-mannered as they used to be in the days of the millennials and backwards. Lessons that are planned carefully and stimulatingly caters to the different learning styles and our students will thank us openly or quietly for taking their personal likes and dislikes into consideration.

Who will be interested in your findings?

Fellow educators, aspiring teachers, trainers, administrators at the school level and the government level is interested in strategies to effectively engage our students.

#### Conclusion

Looking at the needs of today's students while critiquing their views is a task worth embarking on as these researchers share some salient points worth reflecting on. Students, for the most, are the same like us the older ones, but with the social happenings technologically, violence and even significant decline in standard of living, many students come from homes that are troubled and need extra help in the classroom.

The views of these researchers challenge us, as educators to improve on our best effort constantly so that we become and remain relevant to this generation and every generation that we teach.

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