Applying the Current Educational Research when Using Technology in the 21st Century Art and Design Classroom

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Abstract

Students of this millennium are faced with a rapidly changing, technologically based world; a world of instant gratification and information overload. Generation Y and Z no longer need teachers to provide them with information. What they do require are skills in flexibility, organization, the ability to make quick choices, ways to deconstruct information and the ability to think creatively in their solution finding.

This paper discusses the research surrounding learners in the 21st century and will provide ideas that engage secondary middle years students in their Art studies. It will look at the application of virtual space and new technologies in the creating and making of Art and the exploring and responding to Art.

Included are examples of the use of online resources and virtual space to engage students in the classroom based on the educational research discussed.

1. Introduction

With the move in Australian schools to adopt a 1:1 computer policy, the need for all teachers to look at using technology and virtual space to engage millennial students has never been more relevant. In 2001, Marc Prensky penned his "Digital Natives, Digital Immigrants", a paper outlining the learning style of a computer literate generation. Prensky argues that Digital Natives are used to receiving information really fast. They like to parallel process and multi-task. They prefer their graphics before their text rather than the opposite. They prefer random access (like hypertext). They function best when networked. They thrive on instant gratification and frequent rewards. They prefer games to "serious" work. [1]

Whether this is true of all 21st century students may be debatable but the fact remains that students are using technology for entertainment and communication at ever increasing rates. Teachers cannot afford to ignore the technological revolution that has been, and is still, happening.

2. Who are the Millennial Generation?

How are they acting in the classroom?

The current group of students, those born between 1982 and 2004, has been classed as Millennial [2]. Others have called them Generation Y and Z. Teachers are observing in the classroom a set of characteristics shared by the majority of this group, specifically 14 to 16 year olds:

middle years students are electing to do Visual Arts subjects for entertainment, as a career path or both;
they do not want to hear the teacher talk for too long;
they like the teacher to get to know them and what they want to do;
they will question why they are doing something;
they do not like repetitive work, unless they can see the reason for it, (look at the online games they play);
they are great scanners of information;
they can multitask;
they use their computers to play games as much as possible and this will include in class time;
they will text, email, facebook, tweet, again as much as possible and in class time;
some will struggle with technology but this is happening less and less;
they can teach themselves to use software programs;
they will teach each other;
they work more effectively in a group with one computer rather than on their own;
their interest in photography and video is wide spread;
they get bored easily;
they are happy to teach their teachers.

3. Research on the use of e-Resources as a form of student engagement

The range of ubiquitous e-resources available to teachers is vast and somewhat daunting, with little evidence of what actually does engage students. However, there are some explicit examples based on actual research that provide a starting point. One such example of this was the Minimally Invasive Education (MIE) pedagogy that was developed and documented by Professor Sugata Mitra from

Newcastle University in the UK [3]. Known widely as the 'Hole in the Wall' study, it challenges the need for students to be formally instructed in the use of technology. This encourages teachers to explore the wider use of online applications with their students in the classroom without needing to be 'experts' in them. Classroom observations show that students are more than happy to explore the possibilities and teach their teachers. Mitra [4] also observed that once students are engaged, they will teach themselves what they want to know and they will teach each other.

Yet another reference to the use of e-resources occurs in a paper presented by Ken Williams from the Marzano Research Institute at the Morehouse College in Georgia in 2011. He referred to the institute's research on student engagement. One of the four ways discussed to tap into a student's personal goals was the use of technology. A range of online examples were cited in his paper [5]. Williams continues his discussions in this paper around the student's belief in themselves and whether they can do something and how important this belief is to their success. In the classroom, providing tasks in small achievable steps is imperative to building up this belief. Teachers also need to use their knowledge about their students' prior achievements and capabilities to provide feedback into this self belief.

A third such example is found in the work of Marco Torres. A secondary school teacher and consultant to Barak Obama, he has a motto of "stay curious + stay hungry + be creative". His use of video technology together with free online resources and the use of iMovie to engage students is well documented on his website. (torres21) Torres argues that teachers need to learn to use the tool of technology more effectively and that we live in a time, where students are just not recipients of information, but need to be producers of content [6]. Kids want to share and showcase their ideas and what they are learning; the stage is greater than the four walls of the classroom. Teachers need to be tapping into cyber space and working in the "space" that the students inhabit daily.

Another approach, that has been effectively used by business executive turned elementary school teacher, Ananth Pai, has been to use games with his students. With the aim to improve literacy and numeracy skills, he conducted and documented pre and post tests. These results showed strong evidence that using the correct technology has a significant effect on a student's interest and consequently their learning [7].

Professor Sasha Barab [8] in his keynote address at the Australian Computers in Education Conference in Perth, October 2012, discussed the future of gaming in education and the importance of games providing students with an opportunity for transformational play. His explanation of 'transformational play' is when the player uses the knowledge, skills and concepts embedded in the game to make choices that transform the situation. Barab's research into the use of videogames as a curriculum revolves around virtual worlds in which learners are central, important, active participants. A place where the actions one takes has a significant impact on the world and a place in which *what* you know is directly related to what you are able to do and, ultimately, who you become.

4. Pedagogy Research on student engagement

Technology is a tool, like a pencil, and needs to be underpinned by solid educational principles. In the last decade, several extensive studies have been conducted using data to formulate a list of factors that affect the improvement of a student's performance. The Marzano Research Institute in the States [9], Shirley Clarke from the UK [10]; and John Hattie, who is based in New Zealand [11], have all produced quantitative research in this area.

For teachers, dealing with students on a daily basis, the relevance of this information needs to be reviewed in the light of what is observed. "When teachers stop talking deep learning takes place" [12]. Professor John Hattie advocates the need for teachers to reduce the amount of time they spend talking at students in their classrooms. He believes that when teachers stop talking deep learning is able to take place. His research indicates that 80% of many classes is spent in teacher talk. Hattie's research also examines the things that make the most difference to the learning of students. Feedback is at the top of the list. His research also indicates that 40% of what students are being taught, they already know [11].

Michael McQueen in his writings on "The New Ways of Engagement", [13] discusses the importance of building a relationship with the student; not only teachers understanding the student in terms of who they are but also in terms of what they know. "Matrix Learning", a term coined by McQueen, "aims to highlight the relevance and connectedness of learning".

The Millennial Generation needs to see the relevance of what they are doing in relation to the world in which they live. Technology is one way of tapping into this need. We can glean from McQueen's writings that when teaching students we need to be very clear about the expected outcome and flexible in the processes students use to achieve these outcomes. McQueen also stresses the importance of "affirming" the student in the learning process. The issue of the 'granny factor' [4] is when enthusiastic encouragement is given liberally and often to the discoveries being made by the students.

Mitra used unskilled surrogate 'grandmothers' to provide this encouragement in his research. Both teachers and parents are fully aware of how positive encouragement is to students. This reinforces Hattie's view [11] on the importance of feedback.

5. Communication and Learning

Mitra discusses the use of Self Organised Learning Systems (SOLS) in his "Hole in the Wall" presentation [4]. In this approach students organize themselves into groups around a computer and proceed to solve given tasks. Although the cooperative learning model has been around for a number of years, it has been interesting to see it applied in this 'personal computer' age. Undoubtedly, if students are given the opportunity to work cooperatively around one computer, a culture of shared learning will occur.

The research discussed indicates that the old established pedagogy of a quiet classroom with each student working individually on a given task must be replaced for the 21st century learner. This paper suggests a noisy classroom should be an indication of a spirited exchange of ideas and a cooperatve learning space.

6. Applying the research to the classroom

Extensive information on this Millennial Generation tells us that engagement via traditional teaching practices, where the teacher is delivering information to the student, is simply not working. This is evident from observations in the classroom. Ways to engage students, deliver content and feedback need to be reviewed in the light of elearning resources available to students and well grounded in current educational research. Through using pedagogical research, plus, classroom observations and experiences, we can improve the level of engagement of our students by,

- using Technology to know your student;
- using Virtual Space to engage and entertain as part of the learning process;
- using Technology to deliver content and skills (less teacher directed);
- using Technology to help students develop creative ideas;
- using Technology to provide feedback;
- exploring Publishing and Sharing opportunities using Technology.

Technology can be used to 'know your student', thus developing a relationship whereby the student is able to share with the teacher more about themselves and the teacher is better able to assess the needs of the student and what they already know.[13, 11] There are many online sites where users can create an 'avatar'. An avatar has the advantage of allowing the student to take on a persona, which in turn, develops their self confidence. Students think more deeply about what they want their avatar to say and tend to share more about themselves. Using a 'blog' as an online journal encourages the reflective practice of the student. The blog can be public to the class or private, just between the teacher and the student. The advantage of the blog is that it can be accessed beyond the classroom, where both teachers and students have greater time to reflect.

'Virtual space' is where many students already spend much of their leisure time in entertainment. Using educational tools in virtual space is tapping into an interest that already exists and makes learning entertaining. There are many online gaming sites with educational curricula that can be built in to existing programs.[8] A specific example is the Gif sites of which there are many. These sites are similar to traditional zenotropes, however, the speed of delivery can be altered by the user. Teachers can use this technology to stimulate the pupil's visual memory and provide opportunities for their class to create images that can transform and morph.

With a great diversity of students in our classrooms, more and more we need to deliver 'content and skills' when and where the student needs it. Not all students need it at the same time or are ready for it at the same time. Technology creates the opportunity for storing this information so that students can access it when they need it and as often as they need it. A student may be asked to video their teacher delivering content or demonstrating a skill or video each other as they practice a skill. Students become the producers of information rather than receivers of information. [6] Teachers are able to use screen capture software, preparing their own podcasts that students can access in their own time. The concept of the 'flipped classroom' where content is available outside the classroom and then the application of the content and skills are practiced inside the classroom is strongly supported through the advent of technology.

Technology that helps students to 'develop their creative ideas' provides that instant gratification that this generation craves. There is a plethora of online image manipulation programs for creating Art and Design ideas. Programs such as Artweaver.de allow replications of 2D art mediums such as colour pencil or conte, and paint as well as 3D enhancement and provide students with opportunities to explore their work. Students make creative decisions online before constructing the finished product in the real world.

Teachers need to be looking at 'providing feedback' often, in detail and individualized. Dr Robert Marzano, in his model of school reform for Lindsay Unified Schools District, California proposed that teachers do this every two weeks [9].

Teachers need to look to simpler and more effective ways of providing feedback and technology is providing opportunities for this to be done. Screen recording programs enable teachers to give direct feedback to students on their digital created work, by saving as an mp4 file and sending directly to the student. Learning management programs are increasing in schools but need to provide ease of access to students, teachers and parents. Teachers can quickly create online quizzes and tests that provide quick feedback on both the success of a student and the success of the teachers' strategy. Some online software that is available marks the student's responses and records the number of attempts a student takes to get the correct answer.

For a generation that is "connected", not using online 'publishing and sharing' is to ignore one of the greatest opportunities for student engagement. The success of YouTube and Wikipedia attest to this. Students receive affirmation that their work is good enough to be out there and is of value to others. Teachers have many choices available to them to publish and share the work of their students within safe and protected space at the class, school and global classroom level as well as in the public domain.

7. Conclusion

One issue that has arisen with computers in the classroom is the teacher's reliance on formal approaches to teaching. The use of technology, solely as a word processer, and for internet research, is resulting in the disengagement of the learner. It can be argued that teachers do not have the time to review and become 'expert' at using many of the Web 2.0 tools before introducing them to their classrooms. And whilst, Mitra [4] suggests this is not necessary, there is, however, a growing need to provide teachers with a range of ways to use these e-resources. Due to the breadth of ubiquitous agents and the time needed to find suitable ones, teachers more than ever require access to resources that have been proven to be effective. Until this is done, it appears most teachers will not look to incorporating technology creatively in their programs.

Where does the teacher go from here? The World Wide Web hosts many sites that showcase links to e-resources, however, most lack a solid educational basis. Educators require well organized online spaces, ones that document the best e-resources, ones that show evidence of engaging students' interest.

The rise of online professional learning communities indicates that teachers are grasping at these opportunities to share. Social media is providing immediate access for the sharing of ideas for the classroom. (Twitter.com)

It appears that 'Millennials' will not stand still in their use of and adoption of technology. Teachers need to be open to new changes and approaches in pedagogy when it comes to engaging their students and using online resources and virtual space. The 21st century challenge for educators is to know which eresource to use, how to use it and why? Websites that document and have explicit examples are the first step to this happening.

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