Augmenting Reality, Transforming Learning

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Abstract

From very early in life I knew there were hidden worlds – worlds that could be accessed through day and night dreams, through portals in my garden and the portals of my mind. These worlds were populated by ghosts and spirits, fairies and monsters, private investigators and aliens. These realities were as real to me as my day to day existence- the regimented and serious world of schooling.

As I look around today it seems that things haven't changed too much. Today's youth still supplement (or escape) their day to day existence by engaging their waking and dreaming imaginations and have the added (dis)advantage of having greater access to the realities conjured up by mind-altering substances. They now also occupy a multitude of digital spaces which provide opportunities to socialise, wage warfare and share creative offerings. With the rapid evolution of hand-held and mobile communications the boundaries between these different realms is in flux and our education system is struggling to keep up.

But there are opportunities for transformation to occur – one of which may be in the form of mixed-reality games. This paper briefly outlines some of the 21st century educational issues we face, and then provides an overview of the mixed-reality tools that are evolving to provide solutions. It represents the beginning of a PhD research project focussed on using these tools in the New Zealand context – a project that helps me reconnect to the multi-ontological reality I experienced as a child.

Education today

With the advent of geo-aware mobile technologies, it is possible that the boundaries between the physical, digital, social and imaginal realms are becoming irretrievably blurred. However, the industrial era schooling structures we have inherited have not effectively caught up with the boundary-less, multi-realmed nature of post-industrial society. Learning largely remains an activity that is confined to designated physical spaces such as 'the class room' and 'the school grounds'. Even 'e-learning' generally occurs within school boundaries in specially designated labs or classrooms, or on laptops within classroom settings. Mainstream schools begin and end at certain times of the day and, in the higher levels, specialisms remain clearly segregated through the week.

Boundaries of power, role and relationship are also enforced. The roles of teacher and student are clearly segregated with the teacher disseminating information (or facilitating learning) and controlling the classroom environment. The teacher also controls standards ensuring that goals and performance measurement criteria are met at both school and national levels. The experts are clearly separated from the novice, the smart from the 'learning challenged' (Senge et al. 2000).

In most societies, epistemological and ontological boundaries set the outer limit of what is acceptable truth or knowledge, and delineate what is considered to be real versus 'make believe' or imaginings (see Rivera & Sarbin 1998). One example of this in our schooling system is that there are clear boundaries (time, location, structures, resources) between secular and spiritual/faith based knowledge. There are also rules about what is 'right' and 'wrong', and as Ladislaus and Kincheloe note, "…many of the children who get the wrong answers consistently fall outside the cultural norm of whiteness, maleness, and middle or upper-middle classness" (1999, 27). Despite the best intentions of educational reformers and lobbyists, today's education system, although rapidly reforming, still contains many assumptions and ideas from the early 20th century (see Kalantiziz & Cope 2008; Prensky 2001; Senge at al. 2000).

Industrial schooling in a post-industrial society

The dominant 20th century educational paradigm is recognised as not meeting the needs of 21stcentury parents, employers, children or their teachers. Research by the Kaiser Family Foundation (2010) shows that today's young spend disproportionally large amounts of their time consuming various forms of online media compared to print media (cited in Zhao 2010). Levin, Arafeh, Lenhart, & Rainie (2002) note that there is a recognised disconnect between student's experience of media and technology in school and in their lives outside of school. Zhao (2010) also points out that in order to engage children we need to use their media and platforms and assist them to be producers of this media, not just consumers.

We also need to foster their creativity (see Bentley & Seltzer 2001; Hargreaves 2009), emotional and social intelligence (Goleman 1995; 2006) and cognitive skills such as meta-reflection and systemic thinking (see Senge et al. 2000; Shute, Dennen, Kim, Donmez, & Wang 2010) if we wish to properly equip our youth to meet the needs of a 21st century word.

Unfortunately, within the New Zealand education system there is a continued emphasis on rigid standards and measurement which has, even this year, met fierce opposition. On April 9th, 2011 a vote of no-confidence was taken in a meeting by the 750 strong Principals Federation against the New Zealand Minister of Education Anne Tolley. Federation President Peter Simpson was quoted in an Otago Daily Times news article as saying:

> *We have known from the outset that the National Standards are fundamentally flawed and will narrow not broaden children's learning. They focus on the old-fashioned notion that the 3Rs are what count in the curriculum when, in the 21st century, the experts are telling us that the skills children need today are creativity, innovation, critical thinking and problem solving. ("Principals Federation Vote Against National Standards," April 9th, 2009)*

Ironically the solution to this problem, of bringing mainstream schooling into the present, may include marrying 21st century creative technologies with traditional ways of understanding the world, thereby potentially re-engaging today's reality juggling youth.

Alternative Ways of Knowing

Indigenous and first nation knowledge systems have engaged in holistic learning practices for thousands of years. Unfortunately, until very recently, their various and particular 'ways of knowing', have been systematically marginalised by a western education system that devalues many of their underpinning philosophies (see Denzin, Lincoln, & Smith 2008; Smith 1999).

As Ladislaus & Kincheloe (1999) point out, it is problematic to try and create a taxonomy of alternative ways of knowing and alternative pedagogy. They argue that just as academic epistemology is a continuum from positivist to constructivist ways of knowing, so epistemologies of other nations and contexts are not easily able to be generalised or universalised. They also note the high degree of dynamic change within different 'alternative' epistemological groups as cultural cross-fertilisation and internal critique work together to shape culture (Ladislaus & Kincheloe 1999).

However, with these criticisms in mind, researchers (see MacDonald, Cove, McManus, & Laughlin 1989) note that in other realities the sense of 'knowing' can be very different. Instead of seeing reality as separate and object to us, reality is instead seen as multi-dimensional and interconnected existence where spirit directly impacts and interacts with environment. In fact the idea that there is a separate 'environment' is often entirely foreign. In other realities boundaries are permeable between the living and non-living, the material and immaterial, the magical and actual and imaginary. In other realities there is often a connection between knower and known and knowledge is gained through relationships between people, nature and spirit (Meyer 2008). Learning involves attention to process as well as content (Berkes 2009). In fact, learning is acquired through living in one's environment (Berkes 2009) and is connected with the whole person rather than just their mind (Maurial 1999). For this reason, local context and situation is critical to content (Maurial 1999) as a

person learns by actively engaging with their surroundings, perhaps with the advice of a mentor or more experienced member of their social group.

Because education is a lived experience in context, learning is a ubiquitous experience rather than one which is carefully segmented into measureable time slots. Knowledge is, as Maurial (1999, 63) notes, "… alive in the indigenous people's culture." It is the result of interactions between families, communities, indigenous and non-indigenous peoples and is recreated through generations (Maurial 1999).

It is my contention that dynamic, non-linear understandings of time and space may allow the past and future(s) to actively inform the present and other dimensional beings (ancestral or other worldly) to collaborate in day to day and sacred activities. In many societies, reality is co-created and reinforced through the telling and re-telling of stories across generations. These stories are often held as sacred, with only those who have gained special place within a group being able to access the most important of these narratives. Rather than being perceived as a radical alternative, prominent 21st century educational commentators, including Hargreaves, have noted that, "The strength of traditional knowledge can be seen as a firm foundation for innovation and knowledge development in the future" (2009, 952).

Bridging Realities

Interestingly, if we examine the leading edge of learning today: mixed reality games and trans-media storytelling, there are some startling commonalities with indigenous pedagogy.

In general, game based learning is gaining huge traction internationally. As mentioned earlier, there is a need to engage the youth of today in ways that have meaning to them, rather than to their forebears. It is increasingly recognised that play and fun are key to engaging media savvy youth, and that interaction and active participation are pedagogically more likely to permanently embed skills and knowledge (see Bober 2010; de Frietas 2007; McConginal 2011).

The leading edge of digital game based learning is mixed reality games which, as mentioned, have resonance with alternative ways of knowing, and alternative pedagogies. 'Mixed reality', 'hybrid-reality', 'augmented reality': these are terms often used interchangeably to discuss game formats that bring together the physical, digital and imaginal worlds.

Augmented Reality Geo (Location Aware) Game Formats utilise new generation mobile phones (with GPS, and high quality sound and imaging systems) combined with augmented reality applications. Augmented Reality is a situation in which a real world context is dynamically overlaid with coherent location or context sensitive virtual information. Educationalists are experimenting with this game technology to create location-aware mobile (hand-held computing) games that allow a rich interchange of data both from user to facilitator, but also collaboratively from user to user and user to the environment (de Souza e Silva & Delacruz 2006).

Some of the best known examples of these games are: 'Environmental Detectives', a game uncovering a potential contamination within a university setting (Klopfer 2008; Klopfer & Squire 2007); 'Mad City Mystery', where science students play detective to

uncover the real cause of mysterious drowning in a lake (Squire & Jan 2007) and 'Reliving the Revolution', which allows students to relive the Battle of Lexington in the American Revolution (Schrier 2005; 2006), although there are many more and the numbers are growing. MIT's Scheller Teacher Education Program and Harvard Graduate School of Education are lead developers in this area, although there are private companies, such as Qualcomm, working in collaboration with schools to promote mixed reality learning on diverse projects such as 'School in the Park' (Magee 2010).

Alternate Reality Games are a transmedia, narrative based collaborative game form that use a wide mix of digital and physical media to create the game experience (Martin & Chatfield 2006). They are another emerging educational tool that in the last few years have been part of experiments in various formal educational settings (Buxton 2008; Colvert 2009; Gislén, Löwgren & Myrestam 2007). Increasingly they are using GPS systems to locate aspects of the game in physical spaces, combining with mobile digital cinema and geo-caching to create multi-layered, multi-dimensional game narratives that cross the boundaries of time and space. These interactive hyper-narratives offer a sense of agency to their viewers, as they become participants and co-creators rather than passive recipients of the story reality.

'Mixed reality' game formats are increasingly combined to create unique and effective game based learning experiences. Interestingly they share a number of areas in common with indigenous learning systems. First of all they share a foundation of experiential learning. In mixed reality gaming, active participation is required of all game players, and learning happens through active reflection on process as well as attention to content. These transdiscipinary game forms also promote holistic learning. Social, emotional and physical intelligences are tested alongside cognitive intelligence, and depending on the narrative structure and game content, spiritual and imaginal intelligence may also be strengthened.

Also, they have in common a focus on collaborative generation (Bober 2010); players create the content of the game and do so via communication and collaboration (de Souza e Silva & Delacruz 2006; Price & Rogers 2004). Most crucially, mixed reality games acknowledge, and operate across, multiple dimensions of time and space. In ancient times shaman utilised portals such as mirrors, sacred objects and plants to communicate and move interdimensionally (see McDonald, Cove, Laughlin & McManus 1989). Hand-held devices such as mobile phones and iPads can be seen to be new generation portals, allowing students to access the past and distant future and to communicate with other worlds and realities. Stones, trees, rivers and mountains can 'talk' to the user, sharing knowledge and stories with them. Students can deposit stories in their environment, enriching and activating the spaces around their communities.

Mixed reality games, such as 'Environmental Detectives' and 'Reliving the Revolution' allow an imaginal layer of reality to be overlaid on physical landscapes, changing the players' relationship with those spaces, and blurring the reality of the game and day-to-day life, leisure and learning. The game environment is therefore expanded outside the traditional game space and learning can break through the boundary of school room and school yard.

A Cautionary Note

Looking back at these various traits connections can be made with alternative ways of knowing and pedagogical practice. But of course, there are areas where caution should be exercised. To ensure rigour, these games need to be embedded within well-developed pedagogical frameworks. As de Frietas (2007) notes, "where games are inadequately used, selected without clear criteria or incorrectly embedded into practice there are indications that this may lead to negative learning experiences" (p. 18). Also, it would be naive to imagine that these tools can somehow bridge the very deep divisions created through imbalanced power and privilege. But there is opportunity to respectfully engage in dialogue with practitioners from indigenous communities to see what opportunities may exist to collaboratively research this area further.

Conclusion

In the digital age the boundaries of reality have blurred and the structures of the 20th century are breaking apart. Institutions once venerated are no longer trusted, disciplines and professions are rapidly changing and our sense of stability is undermined as never before. I believe that today's youth need to have confidence that their education system is keeping pace with this change, and is relevant to their lives today and tomorrow. It may be possible that these game formats, when married with traditional pedagogy and relevant and respectful cultural wisdom(s), can provide credible way for educators to keep pace with this change and address some of the issues noted earlier in this paper.

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