Through the looking glass: teaching and learning in blended immersive multiuser virtual and real world environments

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This paper reports on the participation of higher education students and educators in blended immersive multi-user virtual (MUVE) environments and real life teaching and learning experiences. Selected next generation technologies engage students and educators within the virtual socially networked e-learning landscape of Deakin Arts Education Centre , and support the interaction of communities of learners in multiple modes, ranging from text and images accessed within the Deakin Studies Online learning management system to the "through the looking glass" virtual world in which the user's creative imagination transports them to the "other side" of their computer screens. These constructed environments enable multiple simultaneous participants to access graphically built 3D environments, interact with digital artifacts and various functional tools, and represent themselves through avatars, to communicate with other participants and participate in collaborative art learning.

Keywords: Blended e-learning, art education, multiuser virtual environments

Today's new generation of students have been variously described as the Net Generation, Digital Natives, Millennials or the Y Generation. They inhabit a world dominated by the use of information and communication technologies where the internet and mobile phone use are commonplace (Oliver & Goerke, 2007) and where years of participation in interactive game play have generated skills linked to high-level visual, audio, digital, or new media literacies. Prensky (2001a; 2001b) argues that learners within this environment effectively accommodate the 'language' of new technologies and its place in their world, and they are comfortable with it because it is, and always has been, part of their reiterated experience. This implies that many students entering higher education have the ability to articulate and create ideas using new technologies and to interpret the layers of meaning multimodal digital environments may convey.

In a study of students entering higher education Kennedy et al. (2008) reveal a departure from Prensky's (2001a) initial concept, where not all students can be categorised as digital natives. Rather, many young people assumed to be part of the e-generation are actually situated within a digital melting pot (Stoeger, 2009) indicating a lack of homogeneity amongst students with regards to the acquisition of skills in using new technologies. Similarly, Lorenzo et al. (2006) state that a typical student cohort in higher education is not just the traditional-age Net Generation, nor have they all had the benefit of state-of-the-art ubiquitous technology. Within a blended e-learning art education project , the potential for a 'digital divide' between students was overcome when students with advanced levels of technological skills and capabilities were encouraged to work collaboratively to develop technical skills amongst lesser competent class members (Grenfell 2009). These skill based activities were augmented with web-based problem-solving to enable active participation in both real and virtual-world e-learning.

Integral to the success of this engagement was the educator whose role was to introduce and support peer assisted mentoring and to encourage students to experience art learning as an active and collaborative process. Students worked together to create new scenarios and build new virtual environments, they considered potential collective courses of action to develop deeper thinking processes and alternative perspectives in particular social, cultural and educational contexts. (Grenfell and Warren 2010).

However, Prensky (2001a) identified an apparent lack of technological literacy amongst some educators labelling them 'digital immigrants'. This view is supported Oblinger (2003) and Frand (2000) who suggest that educators need to engage with new technologies and adjust their pedagogical models to enhance new generation e-learning. Oblinger and Oblinger (2005) also comment that as information and communication technologies have influenced the Net Generation, they significantly impact on the evolving role of the educator, from discipline expert to a participant facilitator. Importantly, the development of a learning community that includes the educator as a co-learner has growing currency and requires re-thinking by educators of conventional methods of conveying information to include innovative ways to accommodate blended learning modalities, maximising the value of new technologies to promote new forms of student engagement.

Emerging collaborative learning pedagogies aim to encourage the construction of knowledge, deep learning and greater skill development to engage students in active learning (Jara et al., 2009). Collaborative learning has a central place in art education and is defined as activities expressly designed for and carried out by interacting groups (Barkley, Cross & Major, 2004), and is most effective when participants verbalise their ideas, challenge others and collaborate to achieve collective solutions to problems (Shih & Yang, 2008). By integrating face-to-face workshop activities and online learning resources within a purpose-built MUVE, the social interactive aspects of a real world classroom can be replicated to provide a virtual meeting place where learners who find it difficult to attend face-to-face classes due to employment, family, geographical or timetable constraints are able to collaborate with peers at times outside of normal class hours (Prasolova-Førland and Divitini, 2002).

Social constructivists contend that reality is constructed primarily through human activity (Kukla, 2000) and that knowledge, which is also a human product, is equally socially and culturally constructed (Ernest, 1999; Gredler, 1997; Prawat & Floden, 1994) by individuals who create meaning through their interactions with each other and with their environment. This model highlights that a society's practical knowledge is situated in relations between participants, their disciplinary practices, the social organization and political economies of professional practice communities (Lave & Wenger, 1991, Gredler, 1997).

Currently, with increasing technological convergence, collaborative models such as social constructivism have the potential to engage students and educators in more authentic forms of learning. However, this pedagogical change is not about technology *per se*, nor is it about students accessing lectures from their iPhones, iPads, Blackberry or iTunes. Students are encouraged to work collaboratively, to use the internet to locate groups with affiliated interests despite geographical and cultural separation, (Beavis 2004) and to join informal 'exchange networks' or more formalised professional 'communities of practice' (Lave and Wenger, 1991).
Using a metaphor of physical space and place to create the illusion of 'being in the virtual world' (Lombard & Ditton, 1997) multiuser virtual environments are shared platforms that allow multiple simultaneous participants representing themselves through avatars (Czarnecki

& Gullett, 2007) to communicate with each other, interact with digital artifacts, and take part in immersive problem solving scenarios and simulations (Dede et al., 2004).This engagement enables a new realm of constructivist learning, enhancing collaborative and individual practice (Bartle, 2004) and enabling students to seamlessly use new technologies to access new ways of learning (Metcalf, Clarke & Dede, 2009) present ideas or respond to core discussion themes (Prensky, 2001a). Students have the capacity to talk and interact in real time, while sharing still or moving digital images, audio streams or adding to the digital infrastructure of the virtual environment, by engaging in art learning episodes and mounting simulated art exhibitions of their work. (Grenfell & Warren, 2010).

In establishing an Art Education blended e-learning community, the idea of the central role of participants in the process of knowledge creation is not new. What is innovative, however, is the formation of a collaborative, active, virtual community who engage in authentic learning to construct knowledge within the discipline of art education. Punie (2007) contends that the collaborative engagement of participants in common or linked experiences and projects has the potential to establish communities of learners based on the perception that interaction, knowledge exchange, experience sharing or creation, stimulating curiosity and novelty enhance the learning process. The more participants believe they can learn from a community by sharing their experiences, projects, and values within it, the more they are likely to engage and participate as active thinking members of that community.

Figure 1: A view of the Deakin Arts Education Centre on Deakin Island in Second Life (Grenfell 2010)

The Deakin University Strategic Teaching and Learning Grants Program (2007) funded the development of the Art Education Centre in *Second Life,* a virtual architectural space that includes venues for large group lectures, conferences and seminars, office spaces for educators, a virtual art gallery with exhibitions spaces for student and community artworks and a festival arena for the performing arts. All spaces have power point and movie display screens that support both streamed video and audio. In-world access to study materials located on the university learning management system (LMS) was provided together with links to conventional web content and social software platforms including Facebook, Flickr, and UTube. Observation has shown, that when students have a plethora of ways to participate and engage in a learning community of practice (Sanders & McKeown 2007) ‘on demand’ access supports high levels of independent asynchronous learning among students. When students develop authentic responses to purpose created digital artefacts the result is an increased

acquisition of knowledge through art discipline based problem solving. (Grenfell 2009)

Devised as an integrated assessment task, a blended e-learning collaborative project was undertaken over a twelve week period by two groups of students enrolled in separate undergraduate art education and public relations courses. Throughout the project, students were required to hold regular timetabled meetings, initially, on campus and later in-world, to facilitate group decision-making and information exchange between the two cohorts of students.
The project outcomes were presented in an in-world art exhibition *Identity,* curated by art education students at the Deakin virtual art gallery in *Second Life,* and a real world public presentation of the virtual gallery promotion *Real Art works in a Virtual World* by the public relations students to an audience of educators and students.

Figure2. Student art works exploring the theme Identity from the foyer of the Deakin Virtual Art Gallery in Second Life. (Source Grenfell, 2010)

Early in the project, the public relations group interviewed participating art students and educators on their perceptions regarding the initial campaign design proposal, its specifications and target audience. Participating educators also used these meetings to survey the twenty-four student participants about their skill levels in using digital technologies and three-dimensional MUVEs including *Second Life*. The survey revealed that fourteen art education students had varying levels of technological competencies while ten, including all the public relations students, had little or no prior experience. These results led to the development of workshops enabling students to acquire necessary technological skills to access the virtual platform. These included scheduled group help sessions with educators in face-to-face and in-world modes, comprehensive written tutorial guides and instructional videos outlining the basics of *Second Life*. These sessions and resources were crucial in assisting students with the transition into undertaking an assessment task within the Deakin MUVE. They also developed skills associated with digital image creation and manipulation. It was immediately apparent that although the majority of students in the group were of the Net Generation (Lorenzo, Oblinger & Dziubam et al., 2006), they did not fit Prensky's (2001a) digital natives profile and that, within the art education cohort, a greater number of mature age students possessed advanced skills including the use of digital manipulation technologies such as *Photoshop*. To overcome this disparity students with more highly developed technological skills and experience with computing technologies were encouraged to work in partnership with less technologically competent colleagues. Individual instruction from educators was also available on demand throughout these sessions and additional support was provided in the form of print based handouts and an instructional video. During the introductory phase,

one of the most rewarding outcomes was the willingness of students to support each other, both verbally and through shared knowledge to acquire new technical skills. Individual success in achieving a positive outcome from what may initially have been a frustrating process was met with great enthusiasm by the group. During these timetabled computer sessions, it was evident that peer group encouragement was important factor in retaining student interest and engagement throughout the initial stages of the project. This observation is supported by Salmons' (2006) concept of the learning community, in which participants are, joined together by mutual interest, exchange existing knowledge and work collaboratively on shared problem solving activities.

Figure 3: A virtual world avatar class portrait . In a virtual world such as Second Life, an avatar is the embodiment of a person usually an online user. Avatars can be custom designed to create a truly unique appearance for each player.(Source: Grenfell 2010)

One of the initial tasks involved the requirement for each student to create an avatar and to individualise the appearance of their alter ego. A person wishing to participate in a virtual world creates an avatar who is the primary medium through which a virtual world user communicates, moves and teleports. Nowak (2004) believes that avatar alter egos can increase a student's sense of social presence and awareness of issues surrounding personal identity. Throughout the project, art education students focused on ideas of *identity* to further personalize an avatar or persona from the stock of default characters provided by Second life developers, Linden Labs. They also explored the concept that avatars are individually sculptured art forms designed by their owners and as such contribute to the aesthetic of the virtual environment. By acknowledging these personae are different from real life human presence and appearance, students individually explored of the 'look' of their avatar as a means of expression of their virtual self as an artistic form. From feline to robot, attractive top models to amorphous beings or objects, each student created avatars involving multiple textures and shapes (Annetta et al., 2008; Giresunlu 2010). Students quickly realised that they had the ability to explore the character of their virtual personas at any time by changing clothing, hairstyles or other elements of visual appearance.

To support individual skills development, each student participated in activities that required interaction with avatar colleagues in the Deakin Art Centre. Students were also encouraged to develop proficiency in using in-built audio, text and MSM communication tools, uploading objects including image textures into personal inventories, experimenting with building and

'rezzing' objects in the 'sandpit'. Other activities included navigation of the interface of the virtual platform by changing the time (day/night) of day, adjusting the sound, experimenting with editing and creation tools and taking screen shots. The successful completion of each task further enhanced students growing confidence in navigating and working in-world. Many students carried out these in-world tasks outside of formal class times. For some, the Deakin Art Centre became a regular meeting place, where their alter ego avatars congregated before teleporting to other *Second Life* sites , returning to report their experiences to fellow classmates and educators. Mindful of social issues occasionally encountered in some *Second Life* locations, students are encouraged, to set their 'home base' to the Art Education Centre before venturing away from Deakin island.

Because of the complexity of the project and oncampus timetabling difficulties, the two groups decided that during the developmental phase they would work independently to create their artworks, design the exhibition space and frame the promotional campaign. Asynchronous in-world meetings became more frequent more as art students continued to work outside timetabled classes to design and construct the exhibition space, upload artworks to personal inventories and generally, to curate the exhibition. Their co-collaborators also used these times to meet with them in-world and report on the development of the promotional campaign. In these contexts, the use of audio was found to be a more efficient form of communication than written text or instant messaging (IM).

Throughout the project, art education student participation was underpinned by two of the most powerful developments to impact on contemporary art experience, the use of information and communication technologies (ICT) for art teaching and learning and the acceptance of technology enhanced artistic practice that includes, still images, video, film, animation, machinima and 2D and 3D installations. *Second Life* offers its simulation platform as open land for imaginative real life pioneers of the arts (Giresunlu, 2010) who are willing to explore digital expression in tandem with aspects of the real life art scene and where, for example, real world artists and film makers including Tim Burton and virtual artist Alizarin Goldflake (2009) blur the edges between reality and fantasy to create and reflect their artistic imagination through digital media. One outcome of this development was that the divide between, what traditionally is categorised as high art and popular art diminished or completely disappeared as art students pushed the boundaries of what is identified in both worlds as innovative art creative practice. Giresunlu (2010) supports the idea that digital artworks undergoing a creative transformation from real life to a simulated digital environment open new contextual avenues for their aesthetic re-evaluation. In *Second Life*, interactive two dimensional art works as well as avatar interactivity within a digital installation's infrastructure heightens the expressive quality of the art form. (Grenfell & Warren 2010). In this environment, avatars are considered artistic creations in and of themselves, painting *Second Life's* ever- expanding canvas with their diverse colourful shapes, and rendering the virtual landscape as a unique global performance. The virtual environment becomes a social space for its residents in generating all forms of art works using the tools of digital graphic media and inbuilt creation tools available within the MUVE platform. Digitally rendered paintings are scripted and built to rotate. Sculptures may change color, shape and sound. Human portraits can morph into other forms as the viewer approaches to appraise what appears to be a living art form.

At the beginning of the project, participating art education students collectively chose *Personal Identity* as the overarching theme for the art exhibition and began the individual and collaborative creative processes of researching and exploring ideas, experimenting, digital

media and techniques to create a collection of artworks to be exhibited at the virtual art gallery in *Second Life*. A conceptual framework in which the artist is perceived as a cultural agent who individually and collectively creates visually aesthetic objects for public viewing, underpinned this strand of the project. For virtual viewers, aesthetic contexts are socially constructed through collaborative interactions and conversations about the artworks with their creators.

In timetabled studio sessions, students explored issues of their own identity within broad societal and cultural frameworks. The process encouraged frank discussion of issues relating to gender, and class and identity, and how these issues impacted on individual lives and broader personal experiences. Students critically examined ways in which art has been traditionally defined, within a given contemporary society. They debated the use of irony and parody as strategies for critical social commentary and the appropriation of artworks to fuse fine art traditions and popular cultural statements to evolve new art forms and new meanings. Students also considered the practical roles of artists, gallery directors, and curators in the creation and presentation of the artwork to a wider virtual community located in *Second Life*. As discussed earlier, one of the initial tasks was for each student to create an avatar or alter ego, where students focused on ideas of the *identity* and considered the concept that avatars are individually sculptured art forms and as such contribute to the aesthetic of the virtual environment. The possibilities of exploring the 'look' of each avatar for individual expression are limitless, especially when all the tools for artistic production, are located on individual laptops for students to freely enact their ideas in creating the art form. As virtual world inhabitants, students realised that they had the ability to explore the character of their virtual personas at any time by changing elements of visual appearance.

During this period, students using computer based digital and in-world creation tools and more traditional art making techniques such as drawing, painting and print making moved freely from virtual to real world experimentation. They kept visual diaries, researching and annotating works located in virtual installations and galleries. They researched artworks located in virtual world art galleries and located other web based resources, including the blogs of established virtual world artists where the use of machinima to record in-world installations and exhibitions provided a valuable resource for students. Direct exposure to virtual artworks enabled students to progressively develop a broad range of technical capabilities enabling them to work collaboratively in-world, to construct the a virtual gallery infrastructure to facilitate their simultaneous participation in both real world and virtual world art learning. In addition, curatorial experts from a regional gallery in Victoria, Australia provided students with valuable insights into mounting an art exhibition. This knowledge provided useful spatial design concepts for students to consider and incorporate into the construction of the virtual exhibition space in *Second Life.*

Observations of the level of student engagement incorporating a blended e-learning approach reinforced the view that the progressive development of a strong technology skills base is crucial for successful art making and working with art based scenarios in-world. Student satisfaction and success was high when they were fully immersed in role playing and problem solving activities that enabled them individually and collaboratively to explore, experiment, research, improvise, reflect, discuss, critique and evaluate their digitally manipulated artworks. These experiences resulted in students mounting their exhibition in the digital infrastructure of Deakin Virtual Art Gallery. The three-dimensional capabilities of this MUVE ensure the experience of gallery viewing can incorporate novel forms of computerised design,

which in turn can promote new forms of artistic composition to accommodate the technical requirements of this platform.

Figure 4: Student Images from the virtual Deakin Art Gallery on Deakin Island in Second Life (Source Grenfell 2010)

Framed around the concept of a proposed partnership with a public art gallery in regional Victoria, Australia, a group of public relations student researchers using the pseudonym *Canvas Communications* researched, designed and developed a virtual promotional campaign for the in-world art exhibition. The goals of their campaign were identified as raising awareness and increasing the level of public visitation in the Deakin Virtual Art Gallery. (Lovell, Pitaro & Taylor, 2009).
Two exploratory in depth reviews with the executive of the participating real world gallery provided useful information regarding current communication strategies used in the contemporary art world. Surveys were conducted targeting current art patrons and higher education students not involved with the project. An initial survey of sixty tertiary students revealed that forty-two percent knew of *Second Life*, and of those, ninety-seven percent had limited knowledge of the function of virtual environments other than for gaming and social interaction. These findings implied that in order to gain exposure for Deakin Gallery in *Second Life*, target audiences needed greater awareness of the nature and potential of virtual worlds. The surveys also revealed that key audiences were open to gaining more knowledge about the virtual Art Gallery, with eighty-three percent of respondents indicating they were interested in art and seventy-eight percent were pleased or extremely pleased to have the opportunity to view art works using three-dimensional MUVEs.

During an interview, the executive of the public art gallery expressed interest in establishing a presence in the MUVE art world. Encouraged, the student public relations campaigners worked to establish a partnership with the gallery. They reasoned that this would allow them to further enhance their promotional activities for the Deakin virtual gallery by leveraging the public gallery's pre-existing reputation, patrons and marketing skills. Further, the proposed partnership provided the opportunity for the public gallery to become a real world portal

allowing the Deakin art gallery in *Second Life* to be accessed by real-world patrons. The public gallery foyer was the proposed the venue for a computer kiosk to provide direct access to virtual art exhibitions displayed in the Deakin gallery. Pre-created avatars acting as guides would enable casual art patrons to access the MUVE and take selected predetermined tours of the various art venues and artworks located in the virtual art.

The campaign group also considered that throughout the university, a greater awareness promotion of the virtual art gallery was necessary. Selected locations on campus, such as the university library, student cafeteria and a number of computer laboratories, were identified as venues for students and staff to access the virtual exhibition.
After a joint meeting of all participants in the project, during which examples of the work of *Second Life* artist Bryn Oh (2010) captured by machinimagrapher Chantel Harvey (2010) were viewed, the decision was made to create a machinima of the art exhibition for display on another website. Large screens will be erected in the cafeteria and the library to play the in-world tour of the exhibition. Promotional post cards, and posters of current artworks, together with information pamphlets were available at all venues.

Conclusion

The success of this initiative involves a number of convergences. There is the convergence of technology facilitated by three-dimensional MUVEs, which forms the key medium for experimentation, innovation and developing new means for students to engage with authentic tasks in ways that form meaningful collaborations between learners. Through these means, the educator's own learning and experimentation enables the convergence of conventional methods of knowledge transmission to facilitate new forms of constructivist learning. In this respect, the classroom not only has new meaning in the three-dimensional digital realm, but also entices institutions outside of the academe to explore emerging technologies to as means of enhancing their own professional and community-based activities. Finally, the convergence across academic disciplines developed strategic partnerships amongst cohorts of students that would otherwise have not been brought together. The deliberate intention of creating a learning community involving students enrolled in separate degrees, with different educational, professional and technological capacities and aspirations, was forged through unified, collaborative and goal-directed participation in a novel technological platform. These convergences become the centerpieces of an evolving art gallery, built on meaningful and ongoing collaborations within and outside the university context, centered on the converged technical capacities of a MUVE platform.
The future of MUVEs and simulations in educational contexts involve the very ingredients that have shaped the evolution of the Deakin Arts Education Island as an appealing and intellectually challenging space for students and other visitors exploring three-dimensional artwork, the practicalities of gallery management, and the identity of their own digital personae. In this respect, as technology and educational practice continue to bridge the gap between the virtual and the real, the test for other educational disciplines in developing meaningful collaborations relevant to their own students and professional fields is only confined by the imagination, and the willingness to translate conventional teaching methods into simulated activities with a discernible real-world relevance.

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