

# The Best of All Worlds: Immersive Interfaces for Art Education in Virtual and Real World Teaching and Learning Environments

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Selected ubiquitous technologies encourage collaborative participation between higher education students and educators within a virtual socially networked e-learning landscape. Multiple modes of teaching and learning, ranging from real world experiences, to text and digital images accessed within the Deakin studies online learning management system and a constructed virtual world in which the user's creative imagination transports them to the "other side" of their computer screens is discussed in this paper. These constructed environments support interaction between communities of learners and enable multiple simultaneous participants to access graphically built 3D (three dimensional) environments, interact with digital artifacts and various functional tools and represent themselves through avatars, to communicate with other participants and engage in collaborative art learning. A narrative interpretative research approach was used to profile the 21st century higher education student learner, to investigate the lived experience and multiple art learning perspectives documented in students' visual journal entries and art educator observations to ascertain if an e-technology rich-augmented learning environment resulted in the establishment of more effective e-learning communities of practice.

*Keywords:* art education, collaborative e-learning, mixed reality, virtual worlds

## Introduction

The transition from a traditional instructional model to a more collaborative model of e-learning enabled a class of 32 second year undergraduate students enrolled in the trimester unit "Navigating the visual world", and the art educator to establish a community of learners within an augmented immersive environment. This included the graphically built 3D (three dimensional) virtual world of Deakin Arts Education Centre in SL (second life), the Deakin Learning Management System, D2L (desire2learn), on campus an art studio and field trips to selected art sites. Within this environment, artistic practice and work-based learning were enhanced through the creation of digital artifacts to support shared knowledge building and authentic learning tasks. Collaborative engagement was identified as an important aspect of the learning experience, given that students' prior learning in the visual arts varied from students completing a visual art major in an undergraduate teacher education degree to those who had no prior experience in art making and were completing the unit as a single elective subject in another discipline degree.

## Profiling the 21st Century Learner

Identifying and understanding student attitudes to learning, their demonstrated expertise in manipulating

traditional art media and techniques, their level of e-technology skills and how they interact with their peers, socially and within formal and informal education, settings were important factors influencing the initial design of the unit “Navigating the visual world”. A preliminary survey of 32 students enrolled in the unit revealed that 75% were school leavers of whom, 95% were women. Similarly, of the remaining 25%, all were female and categorized as mature age students. Of the participants, 95% were undertaking a visual art major in a primary education undergraduate course, and the remainders (5%) were completing the unit as an elective in other courses across the university.

A review of literature profiling 21st century higher education learners variously describes them 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 use of Web and mobile-based applications are commonplace and years of participation in interactive game play had generated high-level new media, visual, audio, and digital literacy skills (Oliver & Goerke, 2007). Prensky (2001a; 2001b) argued that these students effectively accommodate the “language” of new technologies because it is, and always has been, part of their reiterated experience. This implies that many students entering higher education have acquired the ability to articulate new ideas, and to create and interpret digital artifacts using new technologies. It is also suggested that these students comprehend rapid information delivery, prefer multi-tasking, non-linear access to information and active experiential learning (Oblinger, 2003). However, observation of student participation in art studio activities identified that some students, initially assumed to be a part of the e-generation conform more to the profile of digital immigrants (Prensky, 2001a) and are situated within a digital melting pot. This indicates a lack of homogeneity amongst students with regards to experience and the acquisition of skills in using new technologies. Similarly, Lorenzo, Oblinger, and Dziuban (2006) stated that a typical student cohort in higher education is not just the new age of Net Generation, nor have they all had the benefit of state-of-the-art ubiquitous technology. These findings were considered during the development of introductory computer-based workshops and were supported by the responses in a student questionnaire that revealed that not all participating students conformed to Prensky’s (2001a) initial definition. In fact, some mature age students, displayed more sophisticated skills than those of their younger colleagues. As a result of these early findings the potential for a “digital divide” between students was overcome when students with advanced skill levels and capabilities were invited to work collaboratively to develop technical and digital manipulation skills among lesser competent class members (Grenfell, 2009).

Examples of the positive outcomes from this practice are recorded in the images (see Figures 1a and 1b). The comments accompanying the images are from the two students who worked collaboratively in a computer based workshop activity. Their responses illustrate the diverse range of computer skills identified in the class.

One student identified as exhibiting Y Generation characteristics (Prensky, 2001a) stated:

In this activity, I appropriated Da Vinci’s “Drawing of a woman” (see Figure 1a). The original image depicts a serene woman, with the face beautifully rendered but the hair and neck merely suggested with sketched lines in order to keep the face as the focal point. The face almost appears to be coming out of the drawing, as though peering through a veil. I chose to appropriate this image, because I admire the woman’s beauty and serenity, as well as the skill displayed by the artist. I was trying to show my appreciation of Da Vinci’s skill and my desire to learn by paying homage this way. Instead of drawing with conté-crayons, I created my image with photo-shop by selectively cropping an image of myself and then merging it with the original drawing through various filters and careful editing. I ended up with a much warmer hue than the original, but decided to leave it that way, because it better suited my personality. (Grenfell, 2011b)

The second student (see Figure 1b) identified herself as a digital immigrant. She commented:

Wow, what a process! For a Photoshop virgin, I think I did all right! There is obviously much room for improvement which I think can be seen most in top right-appropriation (where Mazzas face is coming through way too much). It was tricky for me to change the color of my face to the vivid colors that Andy Warhol used, but I think it still has a level of success. Keen to practice more! (Grenfell, 2011b)

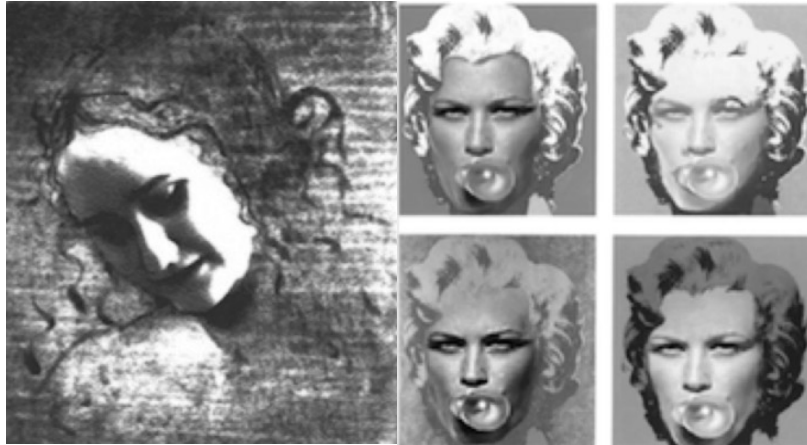


Figure 1a. Digital image manipulation (images reproduced with permission of Grenfell, 2011b). Figure 1b. Journal entry comment digital immigrant.

As a result of these preliminary activities, directed computer-based sessions were timetabled to develop student competencies in a range of digital software, such as the Adobe Creative Suite including Photoshop, movie editing, and Web design including digital manipulation and problem-solving exercises.

Students were also introduced to the Deakin online study environment, D2L and after acquiring an avatar, they began to participate in exercises in the virtual world of the Deakin Art Education Centre in SL. As students mastered new skills in the 3D virtual environment (see Figure 2), they worked together to create new scenarios, including personal studio spaces and a group exhibition space. They considered as potential collective courses of action to develop deeper thinking processes and alternative perspectives in particular social, cultural, and educational contexts (Grenfell & Warren, 2012). Throughout this process, students were encouraged to record their experiences. They took screen shots of in-world activities (see Figure 3), uploading them in the online discussion area within D2L and recording their experiences in their visual journals.



Figure 2. Orientation activities in the sandpit located in the virtual arts education centre (image reproduced with permission of Grenfell, 2011b).

One student reported:

To live in-world, you need to develop your avatar. When you join the SL community, you are invited to choose from a number of basic avatar types. Having arrived in-world, you are invited to customize your look or appearance. A number of possibilities are available free or you may purchase clothing, skins and accessories using Linden dollars from a vendor. Shopping is addictive! (Grenfell, 2011b)



Figure 3. Student B: Studio in SL (image reproduced with permission of Grenfell, 2011b).

In an interview, Student B demonstrated advanced digital technology skills when she outlined how she planned and built an individual exhibition space to present her portfolio of artworks for assessment (See Figure 3). She stated:

I wanted the studio to reflect my personality. It was an extension of the ideas and images I explored in my work, I thought of the space as an installation. I used a number of appropriated images and gave them new meanings but with social, cultural and political underpinning. I will present my final folio of artworks in both the real world studio and the virtual studio on Deakin island in SL. (Genfell, 2011b)

### The Role of the Educator

Laurillard (2002) stated that the introduction of e-learning technologies has the potential to change the role of the educator from transmitter of knowledge to that of facilitator of knowledge transformation, requiring her to adjust her pedagogical models to enhance new generation learning (Oblinger, 2003; Frand, 2000). To facilitate this process, Laurillard (2002) invited the educator to question what is the nature of learning and how does it occur within a rich technology and e-learning environment. Of concern is Prensky's (2001a) statement regarding an apparent lack of technological literacy amongst some educators. In a more recent study, D. G. Oblinger and J. L. Oblinger (2005) confirmed that as information and communication technologies influence the Net Generation, they have significantly impacted on the growing currency of the educator as a co-learner. This requires re-thinking by some educators to include innovative ways to accommodate augmented learning modalities, and maximize the value of e-technologies to promote new forms of student engagement. In this unit, the role of the educator was perceived as facilitator and co-learner, to embrace new pedagogies and practices to support active, collaborative, and authentic art learning. It was also recognized that given the diverse and developing digital and technological skills of higher education students, an instructional role would be assumed by the educator during some aspects of the unit. Throughout the trimester, the educator engaged in a self-reflective journaling process. She recorded that before the beginning of the trimester, bringing all of the

selected learning environments together under the concept of augmented learning was quite challenging, particularly in developing an e-technology skill base that includes designing and developing learning artifacts for online learning, the building of the 3D virtual art education centre in SL and of course working with digital manipulation technologies in image creation. Once the unit began, one of the most valuable experiences for her was to invite support from more skilled students when confronted with a skills-based issue, admitting lack of knowledge and asking for advice. In setting up, this process in both the studio and the computer lab, most students began to share their expertise and to support lesser experienced colleagues. The concept of a community of learners began to evolve (Grenfell, 2011b).

### Pedagogies

Emerging collaborative learning pedagogies to promote active learning (Jara, Candelas, Torres, Dormido, Esquembre, & Reinoso, 2009) have a central place in students' construction of knowledge and skill development. Expressly designed for and carried out by interacting groups (Barkley, Cross, & Major, 2004), collaborative learning is most effective when participants verbalize their ideas, challenge others and unite to achieve collective solutions to problems (Shih & Yang, 2008). Within an augmented learning environment, students seamlessly use new technologies to access new ways of learning (Metcalf, Clarke, & Dede, 2009) to present their ideas or respond to discussion threads (Prensky, 2001a). They have the capacity to talk and interact in real time, share still or move digital images, audio streams or add to the digital infrastructure of the virtual environment, while engaging in art learning episodes or mounting simulated art exhibitions of their work (Grenfell & Warren, 2012).

In establishing an art education e-learning community, the idea of the centrality of the participant in the process of knowledge creation is not new. What is innovative, however, is the ability for students to engage in collaborative and active authentic learning and to construct knowledge within an augmented immersive environment. Punie (2007) contended 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 the more participants believe they can learn from a community by sharing their experiences, projects, and values, the more likely they are to engage and participate as active members of that community.



*Figure 4a. Student avatars and art educator in SL (Courtesy Grenfell, 2011b).*

Because of the asynchronous nature of working in the virtual world (see Figure 4a), students met in-world and worked on the development of the art exhibition space in the evening. The educator reported that there was a small group who met her in-world in the evening. They worked on building the exhibition for a time, then teleported to other locations, such as the street art Laneways (see Figure 4b) build in SL. On return, they reported on their experiences and resumed work, building the exhibition space. One of the most interesting aspects recorded by the educator was the social interaction between the students and the educator (Grenfell, 2011b). She observed that this collaborative relationship continued to develop during on campus studio sessions.



*Figure 4b.* Street art laneway on Deakin Island in SL (left) and student photographic report on street art located in Hosier Lane Melbourne (image reproduced with permission of Grenfell, 2011b).

### **Student and Educator Collaboration in the E-learning Process**

To facilitate student and educator discussion, a framework based on Meredith and Newton's (2003, p. 52) cycle of e-learning was devised. This model focuses on the idea that deep learning results from active participation in problem-solving using a process of experimentation, implementation, and reflection, to achieve an initial solution. The learning cycle continues as new variants and approaches emerge. This model enabled student and educator participants to review outcomes from activities and discussions and to make suggestions to progressively modify and enhance the unit design, content and class activities ranging from text based and image making to interactive virtual constructions. During discussions, the group sought ways to encourage participatory collaborative learning, and to support the emerging learning community. Key questions were devised and provided a common framework:

- (1) How does the concept of augmented reality support a collaborative community of learners in a technology-rich environment?
- (2) Are there benefits of integrating virtual and real world e-learning contexts to students accustomed to a traditional atelier environment?
- (3) What skills do students have or need to acquire to actively engage in a predominantly technology-based e-learning environment?
- (4) What do you consider are the roles of students and the art educator in a collaborative community of learners?
- (5) Did computer workshop activities and peer tutoring support student skills development in digital image manipulation and in-world construction of artifacts?

### The Learning Environment

In the unit “Navigating the Visual World”, all learning artifacts were located within the Deakin learning management system: D2L. The aim was to encourage students to move seamlessly from e-technology based content, consisting of text, static and moving images and audio and movie clips, to online activities linked to discussion boards. These learning experiences are further enhanced by student participation in studio activities using traditional media and techniques or digital image manipulation software and field trips to art focused locations.

By recording their explorations using mobile technologies and data-collection devices (including digital cameras, iPhones, and iTouch), the collaborative learning experience extends beyond the studio or field trip, as students upload and annotate their visual experiences on group discussion boards in D2L and in individual visual journals. Student participation in the unit culminated with mounting a virtual exhibition of their art works in the art gallery on Deakin art education island in SL.

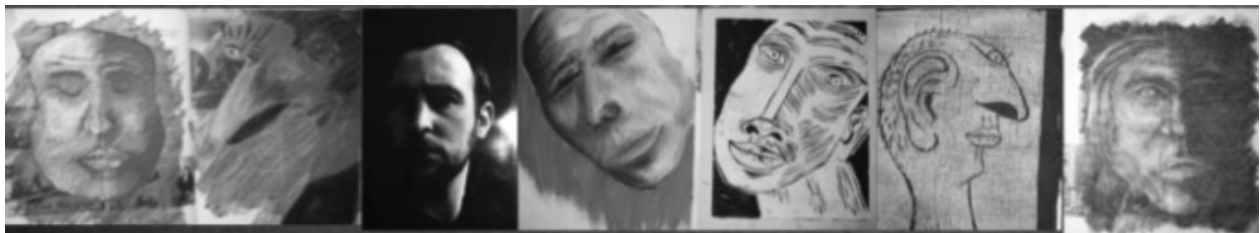
One of the central ideas in developing, this unit was to encourage students to actively contribute to the content development of the unit and to explore concepts of visual literacy in art and popular culture. What this means is to have students actively engage in knowledge creation, to question and to develop their own ideas both in making and responding to art works. The unit study materials are a beginning, providing students with a starting point to their exploration of ideas and key art concepts. Here, participatory engagement is central to the learning experience. Individual journaling participation in online discussion is part of the process that includes uploading visual and text based responses to class activities and personal explorations. Although some students were initially reluctant to participate, their confidence in using technologies grew as they engaged in dialogue with each other, looking at the images, commenting on ideas and the use of media and technique, looking at the appropriation of images and links between text and image. Students also learned to access online study materials from within the virtual environment in SL (see Figure 5).



Figure 5. The learning environment: Accessing online study materials from within the virtual art gallery in Deakin arts education centre in SL 2011 (image reproduced with permission of Grenfell, 2011b).

The focus of the project within the unit “Navigating the Visual World” was to investigate the lived experience and multiple art learning perspectives of all participants and to profile the 21st century higher education student learner to ascertain whether introducing students to a e-technology rich-augmented learning environment resulted in the development of a more effective e-learning community of practice.

In this unit, students engaged with selected ubiquitous e-technologies and traditional artistic processes to focus on the theme “personal identity”. An example of this activity is illustrated in Figure 6 where the student experimented with a range of techniques and styles to represent visually, ideas of his personal identity. Students experienced visual journaling as a form of research inquiry, meaning making, and collaborative learning (La Jevic & Springgay, 2008, p. 37), a practice supported by Connelly and Clandinin (1990, p. 14) who contend that humans make meaning of experience by telling and retelling stories about themselves. In this context, the focus (Beath, 1991; Jeffers, 1993) was on students’ personal learning journeys and the interpretation of the lived experience (Van Manen, 1990; Tan, Wilson, & Olver, 2009) encompassing art making and engagement with virtual scenarios and online e-learning. This notion of the lived experience was chosen for its ability to capture the immediacy and subjectivity of experience (Tam, 2008; Crotty, 1998) and includes contextual and personal frames to enable participants to explore how meaning is constructed as they visually interpret the world around them (Crotty, 1998).



*Figure 6.* Individual student exploration of the theme “personal identity” in the studio (image reproduced with permission of Grenfell, 2011b).

Throughout the trimester, the art educator in the role of collaborator actively participated in dialogue with the student group (Barnacle, 2001) to encourage self-study, to facilitate the visual communication of ideas, critical reflection, and dialogue (Van Manen, 1990, p. 32) and to “capture a phenomenon of life in linguistic description that is both holistic and analytical” (Van Manen, 1990, p. 39). Throughout this process, students and the art educator engaged in journaling activities to assist in the process of reflection and interpretation. Students documented their exploration of ideas, experimented with media including traditional mark making techniques, and the digital manipulation of images. Their artistic decision-making included the construction of a visual language, incorporating image, text and video, and recorded responses published in the online discussion room and in their visual journals. The educator also engaged in a process of self-reflection, to articulate her own experience and to identify ways in which her position may influence the interpretation of issues addressed in student responses (Lavery, 2008). To aid this process, four procedures (Jeffers, 1993, p. 14) were used to construct an interpretative, textual, and visual framework. They were:

- (1) Collaborative student and educator engagement in the construction of participation in augmented immersive learning environments;
- (2) Investigating experience as we live it, student and educator participation in art making processes, including visual journaling;



(3) Reflecting on the essential themes which characterize the immersion in artistic practice and dialogue;

(4) Describing image creation and dialogue as an expression of ideas incorporating an interpretative narrative approach.

The interpretative narrative research focus enabled students to explore the creative process associated with image making, individually, collaboratively and an audience. Image making experiences manifests themselves within a spiraling phenomena of problem-solving, experimentation, implementation, and resolution, where the parts integrate to form the whole experience to support further engagement with the existing artwork and which may result in additional creative work (Glass, 2008). This concept is expressed in the following diagram (see Figure 7).



Figure 7. An interpretative narrative framework within an art making process (image reproduced with permission of Grenfell, 2011b).

### The Narrative of Visual Journals

Visual journals were introduced into the unit “Navigating the Visual World” to enable students to engage in research into their own practice and to develop an embodied and relational understanding between self and other (La Jevic & Springgay, 2008, p. 73). Throughout the trimester, the students’ visual journals became an environment in which they explored ideas, beliefs, and opinions through image and text. Grauer and Naths (1998) believed that the inclusion of text “describes and supports depictions and become graphic devices that aid reflection on personal themes and metaphors” (p. 14). Visual journals formed part of the assessment of the students’ engagement with online study materials, experimentation with media and technique, articulation of ideas and concepts, imagery and text. In Figure 8, Student C incorporates image and text to respond to the question “But what is art”?



Figure 8. Student C response: What is art? (image reproduced with permission of Grenfell, 2011b).

She recorded in her visual journal:

I have always interested in art. For me, it is a source of release and relaxation. Art never judges you on how good you are at, like math and English for which you are always marked on your content. Art allows the exploration of uncommon issues and also feelings. It is the exploration of these feelings that has at times allowed me to explore my and express my own from time to time, as it does not judge or stereotype. I am an only child, and therefore, had to amuse myself a lot of the time, I spent most of this time making things, drawing and or painting. It was always and is still funny for me. (Grenfell, 2011b)

In the following example from Student D (see Figure 9), the focus of the exercise was to explore the concept of personal identity using a photomontage technique developed by the artist David Hockney:



Figure 9. Students employed a drawing medium in their explorations of “personal identity” (image reproduced with permission of Grenfell, 2011b).

Students were encouraged to annotate their visual responses to problem-solving activities:

Art is important in my life because of its freedom, art is subjective and does not stereotype, it allows you to explore issues that are not commonly spoken about. Having that freedom has allowed me to find something that I enjoy and is for me, it enables me to have fun and explore. I feel that art is not just paint and canvas, but is music, ink, drama, film, cooking, anything creative or that shares something about you. Being in a large family and having somewhat of a challenging childhood, I love having this freedom to express myself without others involving themselves. It is my voice (see Figure 9).

Another Student E demonstrated the diversity of ideas generated by the visually rich located, online and virtual learning environment. She outlined her focus:

I was aiming to question the importance of fashion in these pieces, and how it influences our identity, much like Kruger’s work titled “Your Body is a Battle Ground”. I was trying to portray the way women in today’s society are expected to cover up their true selves through the parody of “super balanced” and how much we are expected to sacrifice in order to be accepted by society, including physically giving up our health in order to be thin (seen in the skeletal images of fashion models). In earlier pieces, I used bright colored pencils to emphasize the obvious cover-up, and used a black background to further enhance this through vivid contrast I used a grey-lead pencil on black paper to create an x-ray-like effect on another piece to portray the transparency of women who allow their identities to be dictated by others. In these postcards, I appropriated found images in the style of Kruger to further explore the stereotyping of women. The overall message I was attempting to communicate was how we are willing to make ourselves ridiculous in order to fit in, and how society abuses its power by pressuring women to conform, perpetuating the idea that our existence can only be validated through the acceptance of others, rather than encouraging women to form their own identities. (Grenfell, 2011b)

Throughout the trimester, student and educator’s reflective visual journals recorded individual and

collective experiences of all aspects of the unit. In addition, pre- and post- trimester questionnaires and weekly group discussions enabled students to reflect and comment on their overall participation in the unit. This synergistic collaboration (Salmons, 2011) contributed to the ongoing design and development of the e-learning environment.

### **Art in the E-learning Virtual Environment**

Devised as an assessment task, students participated in a collaborative project to design, to build, and to curate an exhibition of artworks in the Deakin virtual art gallery in SL. Early in the project, students were surveyed about their skill levels in using digital technologies and their experiences with 3D virtual environments including SL. The survey revealed that while all students had been varying levels of technological competencies, no students had prior experience with working in virtual worlds. These results led to the development of workshops enabling students to acquire necessary technological skills to access the virtual platform. They 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 SL. These sessions and resources were crucial in assisting students' develop skills associated with navigating and building in 3D worlds and in digital image creation and manipulation. During these sessions, students with more highly developed technological skills and experience with computing technologies were encouraged to work in partnership with less technologically competent colleagues.

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' (2011) 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.

One of the initial tasks involved the requirement for all participants to create an avatar and to individualize the appearance of their alter ego. Nowak (2004) believed that the individual's avatar alter ego can increase the sense of social presence and awareness of issues surrounding personal identity. Students 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 human life 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, Klesath, & Holmes, 2008; Giresunlu, 2010). Students quickly realized 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 online communication tools, uploading objects including image textures into personal inventories, experimenting with building and "rezzing" objects in the "sandpit". 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 (see Figure 10) became a regular meeting place, where their alter ego avatars congregated before teleporting to other SL sites, returning to report their experiences to fellow classmates and educators. Mindful of social issues occasionally encountered in some SL locations, students are encouraged, to set their “home base” to the Art Education Centre before venturing away from Deakin island.



Figure 10. The teaching environment of the Deakin Arts Education Centre in SL (image reproduced with permission of Grenfell, 2011b).

Throughout the project, students held regular timetabled meetings, initially, on campus and later in-world, to facilitate group decision-making and information exchange.

Because of the complexity of the project asynchronous, in-world meetings became more frequent as 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. They also continued to work in the studio and to upload images and comments into the discussion site in D2L. Their reflective journals charted individual experiences relating to their art making and engagement in the project. Student participation was underpinned by two of the most powerful developments to impact on contemporary art experience, the use of e-learning strategies 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. The virtual environment offered its simulation platform as open land for students willing to explore digital expression in tandem with studio-based art activities, blurring the edges between reality and fantasy to create and reflect their artistic imagination.

One outcome of this development was that the divide between, what is traditionally categorised as high and popular art, diminished as art students pushed the boundaries of innovative and creative practice. Giresunlu (2010) supported the idea that when digital artworks undergo a transformation from real life to a simulated digital environment, new contextual avenues for their aesthetic re-evaluation occur. The virtual environment became a social space for its residents to generate 3D art works using digital graphic media and creation tools available within the virtual platform. Digitally rendered installations were scripted and built to rotate.

At the beginning of the project, participating students collectively chose personal identity as the overarching theme for the art exhibition. They began the individual collaborative, and creative processes of researching and exploring ideas, experimenting digital media and techniques to create a collection of artworks. 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.



*Figure 11.* Student images of self using digital imaging technologies in a virtual art exhibition (image reproduced with permission of Grenfell, 2011b).



*Figure 12.* Students used traditional art making techniques, such as drawing, painting and print making (image reproduced with permission of Grenfell, 2011b).

In timetabled studio sessions, students explored issues of their own identity within broad societal and cultural frameworks (see Figures 11 and 12). This process encouraged frank discussion of issues relating to gender, class, and identity, and how these issues impact on individual lives and personal experience. Students selected artworks and critically examined the definition of art within historical, social, and cultural frameworks. 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. Many of their own artworks reflected these discussions. They also considered the practical roles of artists, gallery directors, and curators in the creation and presentation of the artwork to a wider real and virtual community of viewers.

Throughout the trimester, students continued to make journal entries, researching and annotating works related to their own art making and in response to gallery activities. They located Web-based resources, including the blogs of established virtual world artists where machinima used to record in-world installations. Direct exposure to virtual art worlds enabled students to transition from experiencing in a totally real world environment to progressively develop technical capabilities to enable them to work collaboratively in-world, and to construct their exhibition space on Deakin island. To support this process of a meeting with curatorial experts from a regional gallery in Victoria, Australia provided students with valuable insights into the process of mounting an art exhibition and provided useful spatial design concepts for students to consider and incorporate into the construction of the virtual exhibition space in SL.

## Conclusions

Throughout the trimester, observations recorded by the educator of the level of individual student and group engagement in unit activities reinforced the view that the progressive development of a strong technology skills base is crucial for successful participation in an augmented e-learning environment. Discussion during weekly meetings, online discussion, journal entries, and end of trimester surveys revealed that introducing students to an e-technology rich-augmented learning environment had resulted overall in a high degree of student satisfaction in the development of more effective community of practice.

Students reported that they were fully immersed in problem-solving activities that enabled them individually and collaboratively to explore, experiment, research, improvise, reflect, discuss, critique, and evaluate their digitally manipulated artworks. However, there were a small number of students who indicated that although they had developed higher levels of technology and digital manipulation skills, they would prefer to continue to make artworks using more traditional media and techniques in a studio environment.

Finally, 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 participation in an augmented e-learning environment. As technology and educational practice continue to bridge the divide between the virtual and the real, the test for educators is to develop meaningful collaborations relevant to their own students and professional fields. This development is only confined by the imagination and the willingness to translate conventional teaching methods into a more collaborative, and social model of e-learning with discernible real-world relevance.

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