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Immersive interfaces for art education teaching and learning in virtual and real world learning environments.

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Abstract

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 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 student 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.

Introduction

The transition from a traditional instructional model to a more collaborative model of e-learning enabled a class of thirty two 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 virtual world of Deakin Arts Education Centre in Second Life, the Deakin Learning Management System, Desire2Learn, an on campus art studio and field trips to selected art sites. Within this environment, artistic practice and work based learning was 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 student 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 thirty two 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 post school leavers.
as mature age students. Of the participants, 95% were undertaking a visual art major in a primary education undergraduate course, and the remainder (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 has 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, a later study by Kennedy et al. (2008) identified that some students, initially assumed to be 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 (Stoeger, 2009). Similarly, Lorenzo et al. (2006) state that a typical student cohort in higher education is not just the new age 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 workshops and were supported by student questionnaire responses 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. These early findings revealed 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). The positive outcomes from this practice are recorded in the images and accompanying journal entries (Figures 1a and 1b) from two students who worked together in a computer based workshop activity. In addition, their comments illustrate the diverse range of computer skills identified in the class.

In this activity I appropriated Da Vinci’s “Drawing of a Woman”. 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. (Journal Entry Comment from Y Generation student. Figure 1a).

![Digital image manipulation](Images reproduced with Permission J.Grenfell, 2012)
Wow, what a process!! For a photoshop virgin I think I did all right! There’s 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 colour of my face to the vivid colours that Andy Warhol used, but I think it still has a level of success. Keen to practice more!! (Journal Entry Comment Digital Immigrant. Figure 1b)

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 and included digital manipulation and problem solving exercises. Students were also introduced to the Deakin online study environment, Desire2Learn (D2L) and after acquiring an avatar, they began to participate in exercises in the virtual world of the Deakin Art Education Centre. As students mastered new skills in the virtual environment they worked together to create new scenarios including personal studio spaces and a group exhibition space. They considered potential collective courses of action to develop deeper thinking processes and alternative perspectives in particular social, cultural and educational contexts. (Grenfell & Warren 2010). Throughout this process students were encouraged to record their experiences collectively in the online discussion area within D2L and in their visual journals.

Figure: 2. Orientation activities in the sandpit located in the virtual Arts Education Centre  
( Image reproduced with Permission J.Grenfell. 2012)

To live in world you need to develop your avatar. When you join the second life 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 !!!!!!!. (Journal Entry by Beth)

Figure:3 Hannah’s Studio in Second Life. ( Image reproduced with permission J.Grenfell. 2012)
I developed my studio in Second Life (above) and designed the space to present my artworks. 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 Second Life. (Journal Entry by Hannah)

The role of the educator

Laurillard (2002), states 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 and Frand. 2000). To facilitate this process, Laurillard (2002) invites the educator to question what is the nature of learning and how does it occur within a technology rich, 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, Oblinger and Oblinger (2005) confirm 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 maximise 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 recognised 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.

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 Second Life and of course working with digital manipulation technologies in image creation. Once the unit began, one of the most valuable experiences for me was to invite support from more skilled students when confronted with a skills based issue, admitting lack of knowledge and asking for advise. 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. (Journal Entry by Art Educator).

Pedagogies

Emerging collaborative learning pedagogies to promote active learning (Jara et al., 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 verbalise 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 moving 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, 2010). 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, active authentic learning and to construct knowledge within an augmented immersive environment. 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 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.

Because of the asynchronous nature of working in the virtual world, students have been meeting and working on the development of the art exhibition space in the evening. There is a small group who meet me inworld in the evening, work on the exhibition for a time and then teleport to other locations in SL. They return and tell me what they have experienced and then continue working or leave. One of the most interesting aspects for me has been the social interaction between the students and myself. This collaborative relationship has developed further in the on campus studio sessions. (Journal Entry by Art Educator)
Student and Educator collaboration in the e-learning process

To facilitate student and educator discussion, a framework based on Meredith and Newton’s (2002:52) cycle of e-learning was used. 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 to e-learning 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, to support of the emerging learning community. During group discussions throughout the trimester the following key questions were devised and provided a common framework for discussion:

• How does the concept of augmented reality support a collaborative community of learners in a technology rich environment?
• Are there benefits of integrating virtual and real world eLearning contexts to students accustomed to a traditional atelier environment?
• What skills do students have or need to acquire to actively engage in a predominantly technology based eLearning environment?
• What do you consider are the roles of students and the art educator in a collaborative community of learners?
• 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 Navigating the Visual World, all learning artifacts were located within the Deakin learning management system, Desire2Learn (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 the mounting of a virtual exhibition of their artworks in the art gallery on Deakin Art Education Island in Second Life.
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. So participatory engagement is central to the learning experience. Individual journaling is part of the process but so is participation in online discussion. Students have begun to upload visual responses and text in response to class activities and personal explorations. Although some students have taken time to participate they are now engaging 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. (Journal Entry Art Educator)

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. They were introduced to visual journaling as a form of research inquiry, meaning making and collaborative learning (La Jevic & Springgay 2008; P37), a practice supported by Connelly & Clandinin (1990 p14) 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 (Ajjawi & Higgs 2007) and the interpretation of the lived experience (van Manen1997,Tan et al 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: 5. Individual student exploration of the theme Personal Identity in the studio.

Throughout the trimester, the art educator undertook the role of collaborator, actively participating 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 1990:32) and to “capture a phenomenon of life in linguistic description that is both holistic and analytical” (van Manen1990:39). 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 (Laverty 2003). To aid this process, four procedures (Jeffers 1993:14) were used to construct an interpretative, textual and visual framework. They were:

- Collaborative student and educator engagement in the construction of and participation in augmented immersive learning environments;
- Investigating experience as we live it, student and educator participation in art making processes including visual journaling;
- Reflecting on the essential themes which characterise the immersion in artistic practice and dialogue;
- Describing image creation and dialogue as an expression of ideas incorporating an interpretative narrative
The interpretative narrative research focus enabled students to explore the creative process associated with image making, individually, collaboratively and with an audience. Image making experiences manifest themselves within a spiraling phenomena 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).

Exploring 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 p73). 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) believe that the inclusion of text “describes and supports depictions and become graphic devices that aid reflection on personal themes and metaphors”(P14). Student visual journals formed part of the assessment of student engagement with online study materials, experimentation with media and technique, articulation of ideas and concepts, imagery and text.

An example of image and text in a response by Leanne to the question “But what is Art? I’ve 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 maths 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 fun for me. (Journal Entry by Student C)

Figure: 6. Students explored David Hockney’s technique of photomontage and adapted the concept using a drawing medium in their explorations of Personal Identity (Image reproduced with Permission J.Grenfell. 2011)

Art is important in my life because of it's 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. (Journal Entry by Student D:

Students explored their ideas using both traditional and digital media, uploading their images to facilitate group discussion and critique into online portfolios, and the virtual art studio on Deakin Island. Student and educator 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 eLearning environment.

Figure: 7. Student Postcards. Identity in art and advertising (Image reproduced with Permission J.Grenfell, 2012)

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 coloured pencils to emphasise 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. (Journal Entry by Student E).

Art in the e-learning virtual environment

Devised as an assessment task, students participated in a collaborative project to design, to build and curate an exhibition of artworks in the Deakin virtual art gallery in Second Life. Early in the project, students were surveyed about their skill levels in using digital technologies and their experiences with three-dimensional virtual environments including Second Life. The survey revealed that while all students had 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 Second Life. 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 throughout the group. (Journal Entry by Art Educator).

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’ (2010) 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 individualise the appearance of their alter ego. Nowak (2004) believes 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 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’. 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.

![Figure 8: The teaching environment of the Deakin Arts Education Centre in Second Life. (Image reproduced with Permission J. Grenfell. 2012)](image-url)
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 onto 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 creative practice. Giresunlu (2010) supports 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 three dimensional art works using digital graphic media and creation tools available within the virtual platform. Digitally rendered installations were scripted and built to rotate. (Journal Entry By Art Educator)

At the beginning of the project, participating students collectively chose Personal Identity as the overarching theme for the art exhibition. They began the individual and collaborative 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: 9. Student images of self using digital imaging technologies (Image reproduced with Permission J.Grenfell. 2011)

Figure: 10. Students used traditional art making techniques such as drawing, painting and print making. (Image reproduced with Permission J.Grenfell. 2011)
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, 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 artworlds 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 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 Second Life.

Conclusion

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 eLearning environment. Discussion during weekly meetings, online discussion, journal entries and end of trimester surveys revealed that, introducing students to a 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 an 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, participation in an augmented eLearning 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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