

Lost Cities.

draft by jane turner and gavin sade 2002.

Project Summary

The Lost Cities project sets out to further develop/refine the pedagogy related to the use of multi-user technology in a teaching environment, primarily through the continued use of the Lost Cities MOO in the delivery of KIB814 Applications of Design Technology, and as an extension to the use of Mixed Reality solutions in KIB821 Virtual Reality.

MOOs have been used within academic settings since 1990 (Kort 1990) and have been proven to enhance / enrich students learning experiences through: the provision of rich environments for the exploration of textual expression, communication and creativity (Kolko 1995; Davis 1994; Carlstron 1992; Kort 1990) ; the support of collaborative learning experiences in manners not possible using alternate technologies (Turner 2001); and the improvement of 'technology fluency' through the use of constructivist approaches to teaching and learning (Bruckman 1994, 1998; Shneiderman 1997; Shield et.al. 2000).

This project will develop a strategy for the extension of the MOO into a Mixed Reality platform capable of supporting rich media, multi-modal interactions. The use of a MOO as the core for such a development has already been demonstrated by Novak, Fleischmann, Strauss et.al. 2000, through the creation and demonstration of a technological framework for development of electronic arenas integrating on-line and on-site participation. This proposal will investigate the potential application of such work in an educational setting initially with focus on KIB814 Applications of Design Technology and KIB821 Virtual Reality with a view to provide similar environmental exploration to other courses and units both within Communication Design and Creative Industries and potentially cross faculty in Information Technology and Built Environment.

Definition of terms:

“MOO (Multi-User Domain Object Oriented) is a computer program that allows multiple users to connect via the Internet to a shared database of rooms and other objects and interact with each other and the database in synchronous time.” (Haynes, Holmevik 97) A MOO provides facilities that allow a community of users to ‘build’ a virtual world entirely in text. The affordances for ‘world building’ and ‘communication’, despite the age of the technology, are still more sophisticated and accessible than any of the current alternatives.

Lost Cities. Communication Design is running a MOO (called Lost Cities) on the Faculty of Creative Industries server Kubrick. Lost Cities uses Encore Xpress to provide a web interface to the MOO. Lost Cities can be accessed via the following URL: <http://kubrick.cdes.qut.edu.au:7000/>

Mixed Reality is a term used to describe environments that support the interaction of communities of people with both physical and digital/information spaces. Focusing on facilitating interaction of participants who are both on-site and on-line (Milgram 94) (Benford et.al .98) (Benford et.al. 99)

Project in Context

The real issue/problem this project sets out to address is how to develop/extend the current MOO into a Mixed Reality environment while maintaining a constructivist pedagogy which is supported by the properties/characteristics of the MOO, as detailed above, and led the authors to the selection of the MOO in the initial curriculum design of KIB814 Applications of Design Technology. Such an extension is seen to directly address contemporary challenges faced both inside and outside the university within the context of design of computer mediated interactive products for the networked knowledge society.

In relationship to the teaching and learning priorities this project specifically aims to:

- (i) improve the level of “technology fluency”, and promote life long learning attributes;
- (ii) continue innovation in the use of the MOO as a space for experiential learning and assessment, supporting the priority to improve student generic capabilities through assessment;
- (iii) develop a technology based constructivist learning

environment as an interactive tool for the collaborative construction of 'immersive' mixed reality simulations;

(iv) provide a greater range of interactive learning experiences, resources and options via the use of technology within the Faculty of Creative Industries that may as a result be utilised by other areas of the university;

(v) investigate the potential for such technology to support flexible delivery, specifically focusing on the provision of a greater range of interactive learning experiences and the fostering of on-line communities of learners.

Please note that aims (iii), (iv) and (v) are consistent with the challenges presented in the areas of growth presented in the QUT on-line teaching framework.

Definition of terms:

Constructivist pedagogy is based in the works of Dewey, Montessori, Piaget, Bruner et. al and represents a shift in approach to education, from a behaviourist epistemology to a constructivist epistemology (Fosnot 1996), which is particularly resonant with the challenges presented with/by the contemporary networked knowledge society. Gagon and Collay identify four assumptions that form the core of their constructivist pedagogy, where they view knowledge as being: physically constructed by learners who are involved in active learning; symbolically constructed by learners who are making their own representations of action; socially constructed by learners who convey their meaning making to others; and finally, theoretically constructed by learners who try to explain things they don't completely understand.

Technology fluency. "What does it mean to use technologies fluently? To be truly fluent in a natural language (like English or French), you need more than phrase-book knowledge; you must be able to articulate a complex idea or tell an engaging story – that is, you must be able to "make things" with language. Analogously, fluency with new technologies involves not only knowing how to use technological tools, but also knowing how to construct things of significance with those tools.

Fluency means not just accessing information on the Web, but creating your own Web pages. Not just downloading MP3 music files, but creating your own digital-music compositions. Not just playing SimCity, but creating your own simulated worlds." (Resnick 2001)

Evaluation of the use of technology and computer-based learning environments to date (Reeves 1997) indicates a focus on implementation of technological innovation with a lack of regard to pedagogical perspective – specifically the pedagogical perspective built-in to the technological presentation. For example the use of the web to provide on-

line resources proliferates but many web-based materials merely present the textbook or the lecture on-line. Technology based environments that are developed with an embedded constructivist learning pedagogy, generally speaking, focus on the presence of the educator in order to ensure that the task is achieved (for example Tom March and Bernie Dodge's webquest philosophy: <http://webquest.sdsu.edu/webquest.html>) or, provide sophisticated interactive flash-shockwave-java environments for very specific instances of learning (see for example: NASA Quest's Astro Adventure: <http://quest.arc.nasa.gov/projects/astrobiology/astroventure/>). There is a clear dearth of resource environments such as these at tertiary level and the majority of on-line technology based environments available to tertiary educators provide rich opportunities at the administrative level of teaching and learning but not at the pedagogical level (see for example [Blackboard.com](http://www.blackboard.com)'s version 5 press release applauding new administrative tools).

The most compelling vision of the use of technology as a powerful pedagogical tool is expressed by Seymour Papert in his 1980 work: *Mindstorms*. The underpinning logic of this work is to use technological environments as places where exploration can take place. This enables the learner to construct their own knowledge and offers opportunity to question the foundational skills necessary to educate themselves and build mental models of the world. While Papert's work focuses on young learners, it is a strong aspect of the knowledge nation rhetoric that all students become efficient life-long learners adept in the navigation of technological environments.

This efficiency is not brought about by USE of technology but by FLUENCY with technology (Resnik 2001). The university stakeholders may be currently viewed as being reasonably adept users of technology, with the use of the on-line teaching facilities, university wide email and QUT virtual being well established. Of interest in this proposal is the provision of a technology based learning environment where the participants can go beyond usage and construct their own creative work within a community of other learners.

The Lost Cities project seeks to address this gap in interactive tools at the pedagogical level by developing the currently exploited interface. This software is currently embedded within the University's On-Line Teaching (OLT) provision and offers the following pedagogical tools:

a. for students and participants:

- provision of an established community based environment

- synchronous (real time) and asynchronous exchange within the same environment
- 'ownership' of the environment, that is the ability of participants to create and publish within the environment instantly
- open-ended creativity within the environmental parameters
- collaborative opportunities within the environment based on individual publishing 'rights' (that is any individual student may pass on 'ownership' and share objects within the environment)
- constructive learning opportunities within the environment (the MOO based environment is based on a metaphor of space and as such provides unique 'building' opportunities)
- access to a robust but simple programming language within the environment that can be handled by a wide range of students or ignored if not applicable)
- open ended creativity at the level of writing/publishing on-line

b. for educators and administrators:

- a discrete environment based on user – password access which can be opened or closed remotely
- individual activity audits including presence and visits
- open source software and low bandwidth

The Lost Cities MOO has been used successfully for the past three semester (including this semester) and this proposal now seeks to address some key issues of DESIGN in order to facilitate further use of the environment within the faculty and university. The current version of the environment used in the aforementioned units has been designed specifically as a classroom – writing environment. It is core to this proposal to develop the MOO further in order to make it a more versatile technology for use in the Faculty of Creative Industries and the wider university where applicable.

Description of the Project

Objectives

The primary objective of this project is to improve the teaching and learning environment and optimise student learning experiences through the continued innovation and refinement of the pedagogy related to the use of multi-user technology in teaching and learning. This directly addresses objective 1 from the university teaching and learning plan 2002 – 2006.

The second objective is the continued use of the Lost Cities MOO to support student studies in the field of on-line communities, computer games and multi-user applications. This will be achieved by developing an experiential learning environment where students who are studying online/virtual communities actually engage in such a community during their studies. This not only provides a collaborative, community oriented constructive learning environment but also provides a space for the development of the generic capabilities discussed in the previous section. Thus responding to objective 2, strategy 2.1, “Ensure that QUT graduates have generic capabilities as well as those associated with the relevant disciplines and professions.” Taking note of target 2.1a relating to technology literacy, which the authors read as technology fluency as defined by Resnick 2001.

The final objective of this project is to develop a strategy for extending/turning the current MOO into a Mixed Reality platform capable of supporting rich media and multi-modal interactions. This will enhance student experience and provide a framework for students to develop visual worlds and objects which are layered over the textural worlds and objects of the current MOO. Thus providing students with a pathway into later classes including KIB821 Virtual Reality, and providing these classes with a base environment to work with(in).

Positive impact on student learning.

The project will lead to the improvement of student learning outcomes through the continued refinement / development of the “Lost Cities” MOO, which is a proven written – literacy based platform used for collaborative community orientated constructive learning. (Schwienhorst 1998; Shield et al 1999; Davies et.al. 1998)

Students will be involved constructively in this project through engagement with the MOO in KIB814 Applications of Design Technology where they will be required to become an active member of the on-line community and will construct the virtual environment/world(s) inhabited by the community. The project will also seek student involvement through KIB815 Interaction Design 2, KIB821 Virtual reality and KIB823 Design Practice, these students will be involved in the research and development related to the extension of the MOO.

The project sees the embedding of technology literacy and creativity within curriculum in a manner that supports a diversity of students. KIB814 Applications of Design Technology is a core unit in the Communication Design sub major and normally has a cohort of students from a number of study areas including the single degree programs within Creative Industries and programs that include higher levels of computer

science / information technology content (ie IF90 Double Degree in Information Technology and Creative Industries Communication Design). The MOO environment provides affordances that allow students from both backgrounds to be active members of the on-line community and to work collaboratively in the construction of the virtual environment/world. (Bruckman 1994, 1998)

The direct engagement of students in this activity of construction of and participation in a collaborative on-line community reflects real world demands of employment and will improve learning outcomes by support both life long learning and addresses demands/requirements of industry.

Previous work and 'off the shelf resources'

As already discussed this project builds on the existing use of a MOO within the Communication Design undergraduate unit KIB814. The MOO has been successfully used in this unit for the past three semesters (including semester 02 2002). Currently Lost Cities uses the Lambda MOO Core (freely available) combined with the Encore Xpress web Interface (also freely available). Through the use of this technology over the past three semesters a number of significant issues have been identified that require resolution in order to improve students experience, and maintain a contemporary focus.

The use of a MOO as the core for multi modal mixed reality has already been demonstrated by Novak, Fleischmann, Strauss et.al. 2000, who use identical core technologies as proposed in this project and created custom extensions that allowed for the development of Three D visual worlds, connection to tangible interfaces, connection to streaming media services, and provision for delivery on hand held devices. To the knowledge of the authors such a framework has not been utilised within a teaching and learning environment, especially with an underpinning social constructivist/experiential pedagogy. The software developed by Novak, Fleischmann, Strauss et. al. 2000, from Media Arts Research Studies (MARS), is advertised as being available to institutions interested in collaborating with MARS. The authors have made an initial approach to MARS regarding such a collaboration.

The authors are also currently developing relationships with staff in the Faculty of Information Technology and the Faculty of Build Environment and Engineering with a view to a cross faculty collaboration that will work towards developing a technological framework influenced by the work of Novak, Fleischmann, Strauss et.al. 2000, and Ishii 1997.

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[1] Lost Cities environment is already being explored by Drama for the purposes of process drama in KIB214 Theatre as Social Action and is also being investigated as a basis for early interactional programming experiences for Introduction to Media Technology (KKB818 / KIB807 / KIN818) and advanced design studies in Interaction Design 2 (KIB815), Virtual Reality (KIB821) and Design Practice (KIB823)

[2] The school of Maths and Science in the Faculty of Education is also investigating use of MOO spaces for student collaboration

[3] The expression wizard refers to the internal MOO administrator and denotes as certain level of access and authority.

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