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Role-based e-learning for university students : a comparison of Australian, American, British and Singapore designs

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Role play in face-to-face contexts has been shown to be a powerful teaching design at all levels of education. The arrival of e-learning makes it possible to engage with different types of role play, for example inter-national and inter-institutional collaborations, role plays blending online and face-to-face interaction, role plays blending synchronous and asynchronous media including recordings of the sessions, and role play within distance learning contexts. It is now possible to conduct elaborate and responsive role play activities where the identity of the participants is not immediately apparent, where they may use avatars or inhabit 3D virtual worlds as part of the role play. This paper charts the development of role-based e-learning over the past 20 years in Australia using simple e-learning technologies such as email and online discussion forums and compares this with emerging forms of the e-learning design which are adopting newer technologies in America, Britain and Asia.

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Role-based e-Learning for University Students:

A Comparison of Australian, American, British and Singapore Designs

Introduction

Role play in face-to-face contexts has been shown to be a powerful teaching design at all levels of education (Bolton & Heathcote, 1999; Levy, J. 1997). Through description of a number of examples, this paper will illustrate how role play can be undertaken in online environments. The technologies required need not be sophisticated. In fact, a wealth of very powerful role play designs have been implemented in Australia over the past 20 years (Wills, 2010). This paper sets out to compare the role play designs adopted in Australia with more recent examples of role play and simulation found in other countries.

Role Play

Role plays are situations in which learners take on the role profiles of specific characters or representatives of organizations in a contrived setting. Role play is designed primarily to build first-person experience in a safe and supportive environment. Much of the learning occurs because the learning design requires learners to explore and articulate viewpoints that may not be their own. It is a similar learning experience to that of debating except there is potential for the learning to be more personal and less abstract as participants actually put themselves in somebody else's shoes. Many learners find the personal aspect more engaging than the formal aspects of debating. One student interviewed by the author describes the experience in the following way. This student was a participant in *Environmental Decision Making Round Table Discussion* (Brierley et al, 2002) at Macquarie University, Australia.

I was Minister for Fisheries and I had to research it quite thoroughly before I went online in order to understand where someone in that position would be coming from but I also had to research all the other roles in order to be able to state an argument and one that possibly could not be challenged … I found out many aspects of my own character and personality that I was not aware of so it was not just a learning tool for understanding fisheries, it was a learning tool for understanding the processes for how I think about things. I was quite surprised at times about the way I developed my argument to try and convince people that my position was one that the committee should take. I learnt communication skills, negotiation skills and also how to articulate those ideas that I developed through my research on that topic … It is very interesting in a role play to see how things change and fluctuate through the whole process. You might think things are going a certain way then someone throws something in and you hadn't thought of that so you have to start reconsidering how you came to your ideas … It was a different teaching method. It was stimulating. It wasn't just sitting in a lecture theatre listening. You are interacting with each other and it made you think in different ways. [1]

Educational Rationale

As a theoretical basis, the focus on designing for learning through the use of games, simulations and role plays draws on the work of a range of constructivist, constructionist and connectivist authors including Vygotsky (1978), Rogers (1969), Brown, Collins & Duguid (1989), Brookfield (1995), Papert (1991), Duffy & Cunningham (1997) and more recently Siemens (2005). An online role play learning design, empowers learners to construct their own meanings, to test the multiple perspectives of a social setting, to construct their own

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[1] http://www.learningdesigns.uow.edu.au/guides/info/G1/more/C3Cliplist.htm#esm

learning environment, to harness the power of the internet to facilitate connections with resources and each other, and to use those social networks to validate their mental models.

On a more practical level, online role play draws on the principles of high quality learning derived from recent reviews of the literature by Boud & Prosser (2002) and Siemens & Tittenberger (2009), combined in Table 1. Online role play engages and challenges learners, and provides a safe environment for practising skills in a situated social context. A well-designed role play provides a reflective debriefing phase and facilitates learners to move between theory and practice and co-construction.

Table 1

Some principles of high quality learning

Boud & Prosser Summary of Principles	
Engage learners	Consider learners' prior knowledge & desires & build on their expectations.
Acknowledge learning context	Consider how the implementation of the learning design is positioned within the broader program of study for the learner.
Challenge learners	Seek the active participation of learners, encouraging them to be self-critical
Provide practice	Encourage learners to articulate and demonstrate to themselves and their peers what they are learning.
Siemens & Tittenberger Summary of Principles	

Social	Learning is a social process and knowledge is an emergent property of interactions between networks of learners.
Situated	Learning occurs within particular situations or contexts, raising the importance of educational activities mirroring actual situations of use.
Reflective	Learners require time to assimilate new information.
Multi-faceted	Learning incorporates a range of theory, engagement, "tinkering" or bricolage, & active construction.

Role-based e-learning provides opportunities to address all the principles of quality learning design. In particular role-based e-learning addresses the principle that learning should be situated and authentic. Herrington, Reeves & Oliver (2009) have described situated, authentic learning as engagement in an inventive and realistic task that provides opportunities for complex collaborative activities, listing nine elements of authentic learning:

1. Provide authentic contexts that reflect the way the knowledge will be used in real life

2. Provide authentic activities

3. Provide access to expert performances and the modelling of processes

4. Provide multiple roles and perspectives

5. Support collaborative construction of knowledge

6. Promote reflection to enable abstractions to be formed

7. Promote articulation to enable tacit knowledge to be made explicit

8. Provide coaching and scaffolding by the teacher at critical times

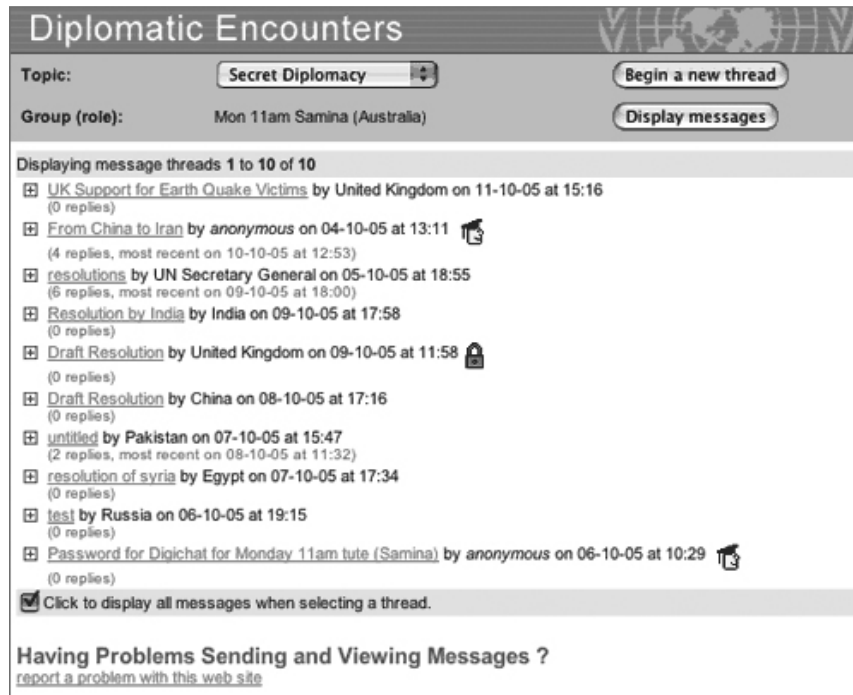9. Provide for authentic assessment of learning within the tasks.

Role-base e-learning is authentic e-learning, addressing all nine elements. However role play's most significant contribution is in addressing the fourth item on the list above:

providing multiple perspectives. In role play this is done through the construct of learners assuming a role whilst undertaking authentic learning activities.

The Technology Underpinning Role Play

Online role plays are generally conducted via email or a combination of email and web-based threaded discussion forum (see Figure 1).

Figure 1. Screen capture of Diplomatic Encounters online role play at University of Western Australia showing threaded discussion by students in role as national delegates for UK, China, Syria, Russia, Pakistan, and Egypt (Yasmeen & Fardon, 2002).

These technologies are called "asynchronous" technologies, meaning that users do not have to be online at the same time. Messages are stored and read in the receiver's own time and replies are likewise stored and read when the user is able to be online. This contrasts with face-to-face communication and telephone communication which can only happen in real-

time. These "synchronous" technologies in an online environment are for example Chat, *Skype*, *Second Life*[2] etc.

Online Role Play and Blended e-Learning

Online role play need not be entirely online. Whenever in this paper the term "online role play" is used, it is assumed that it has been the designer's choice to implement it along a continuum from wholly online through blended (Littlejohn & Pegler, 2007) to mainly face to face depending on their educational context. However, as the real power of this teaching technique stems from the interaction among roles being mainly in an online environment, most examples in this paper are implemented in a blended e-learning environment. Very few are in a wholly online environment.

Format of Online Role Play

Online role play has a different format and a different purpose from traditional one-to-one role play. It also differs from another traditional face-to-face technique known as "scripted role play" in which participants take on and understand a role by reading from a script pre-written by the designer/educator. These techniques are often used in a "fish bowl" setting, that is, where some participants take on roles and the remainder of the group observe the action before making their own attempt at the role. Both participants and observers contribute to the discussion about the implications of the scenario they see enacted before them. In online role play, it is more usual that the whole group participates simultaneously in the action, although it is conceivable that the fish bowl technique could also be used in an online environment (Douglas, 2007).

An Australian national project[3] was tasked to identify learning designs that have been demonstrated to contribute to high quality learning experiences and determine which learning

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[2] *Second Life* is a free 3D virtual world where users can socialize, connect and create using free voice and text chat. http://secondlife.com/

designs may be redeveloped in a more generic form. One of the four categories of quality

learning designs identified by the Learning Designs project team was role-focused learning

designs. The generic Learning Design for online role play is illustrated in Figure 2 (Wills &

Ip, 2002).

Figure 2. Online role play from the learner's perspective

The Learning Designs Project evolved a graphical representation mechanism to describe

and document the generic learning design in terms of the tasks, resources and supports that

would be required in the learning setting (Hedberg et al, 2002). This 'Learning Design Visual

Sequence' representation uses the following graphical notation aligned into three columns:

- squares represent Tasks

- triangles represent Resources

- circles represent Supports

[3] funded by the Australian Universities Teaching Committee (AUTC) 2000-2003

- asterisks represent assessable tasks.

Nomenclature

The naming of the field of online role play has been a contested area. Terminology used to describe the field at times include: online role play (Wills & Ip, 2002); authentic learning environment (Herrington, Reeves & Oliver, 2009); virtual situated learning environment (Jones, 2007); transactional learning (Barton, McKellar & Maharg, 2007); experiential learning (Demetrious, 2007); role play simulation (Vincent & Shepherd, 1998); e-sim (McLaughlan, Kirkpatrick, Maier & Hirsch, 2001). The variation in names makes it difficult to find case studies in literature searches and databases. This hampered the growth of any support community for the innovative designers of this form of e-learning.

It is a form of e-learning that has been developing in Australia over the past twenty years as charted by Wills (2010). The lack of consensus on naming has particularly hampered the building of the Australian community: as a country of small population, splitting the potential support community via diverse nomenclature was counter-productive to self-identification with a critical mass of similar designers. Nomenclature was one of the first tasks tackled by Project EnROLE[4], an Australian national project[5] designed to follow-up the role play part of the Learning Designs Project by specifically working to encourage uptake of online role play in Australian university education. The project adopted the following characteristics of online role play as a definition:

- Designed to increase understanding of real-life human interaction and dynamics

- Participants assume a role in someone else's shoes or in someone else's situation

- Participants undertake authentic tasks in an authentic context

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[4] enrole.uow.edu.au

[5] funded by the Australian Learning & Teaching Council (ALTC) 2006-2009

- Task involves substantial in-role interaction with other roles for collaboration, negotiation, debate

- Interaction between roles is substantially in an online environment (Wills *et al.* 2009, p.2)

Since the official close of the project funding, the team has been working to grow Project EnROLE's Australian community of online role play designers into an international community. However terminology again proved to be a stumbling block. Countries outside Australia have not usually used the term online role play and have often used different, more expensive technologies.

The project proposed the term "role-based e-learning" as a broader inclusive nomenclature for the area and this enabled the project to include examples from around the world. The above-listed terms representing the various e-learning activities all have in common a focus on *roles*. They may vary in number of roles and type of role as well as the types of scenarios that the roles grapple with. However, they all use roles as means to place learners in someone else's shoes. The name "role-based e-learning" has therefore been coined as a broader term encompassing a range of approaches to e-learning that are based on learners adopting roles.

This paper uses a number of examples of designs for role play and simulation to illustrate their differences and at the same time to illustrate how they fit under the broader concept of role-based e-learning.

In this paper, the name "online role play" is also used, sometimes interchangeably with the broader "role-based e-learning" name, but usually to refer to a specific example, or to be more concrete, or sometimes for brevity.

The Australian Learning Design for Role-based e-Learning

One of the earliest examples of online role play was Middle Eastern Politics initially

developed at The University of Melbourne in 1990 (Vincent & Shepherd, 1998). In Australia

other pioneering work in online role plays has been conducted in university-level subjects

including politics by Linser, Naidu & Ip (1999) and Kinder, Fardon, & Yasmeen (1999);

economics by Freeman & Capper (1999); psychology by Chester & Gwynne (1998);

engineering by McLaughlan et al (2001); education by Bell (2001, 2002); geography by

Brierley et al (2002); and history by Wills, Ip & Bunnett (2000). Most of these are based on

Vincent's first online role play. Adapting a family tree metaphor, Figure 3 illustrates the

impact of this pioneering design (Wills et al, 2009). At least 14 further role plays have been

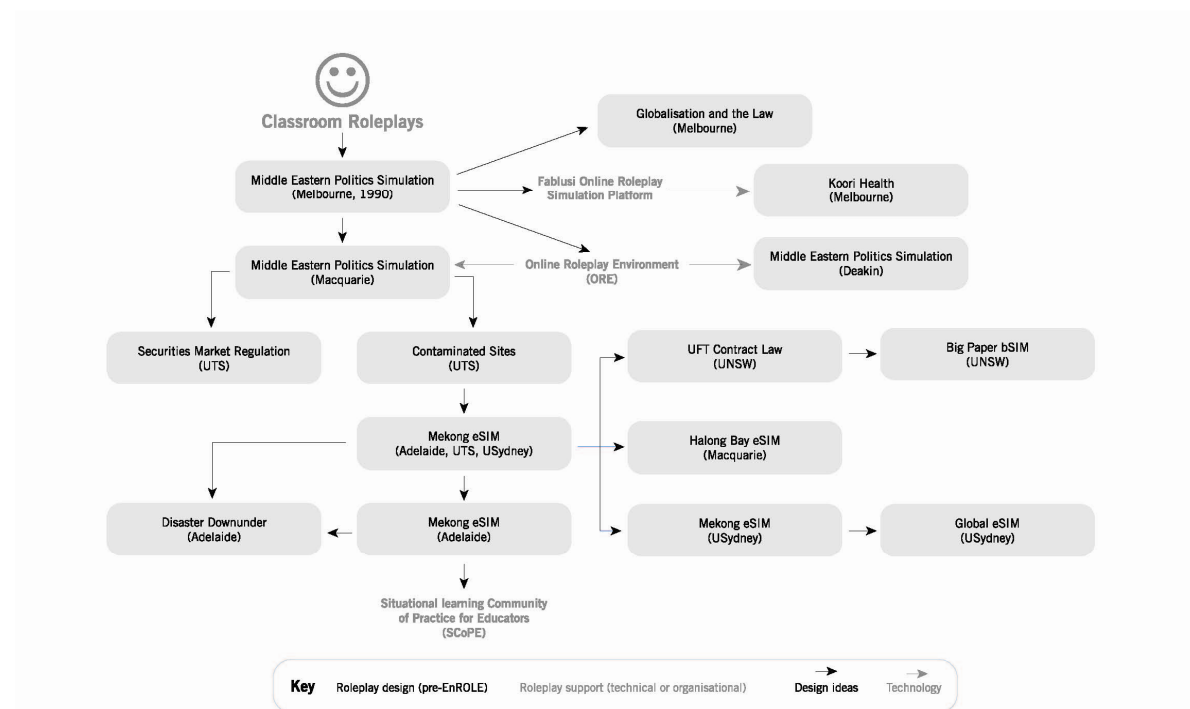designed on the same model as Middle Eastern Politics.

Figure 3. Middle Eastern Politics: impact for over 20 years (from Wills et al, 2009, p.26)

Australian Example 1: Middle Eastern Politics

Vincent's pioneering online role play at The University of Melbourne in Australia

adapted the US work of Gamson (1966) who used face-to-face role playing (called *SimSoc*)

with college-level social science students. Middle Eastern Politics is an extended role play

conducted over a number of weeks via a purpose-built web-based interface (Figure 4). It was

run successfully by Dr. Andrew Vincent and Dr. John Shepherd who continuously developed

it for over fifteen years with overwhelmingly positive student feedback (Vincent & Shepherd,

1998). Student evaluation of the role play has indicated that it is a powerful learning tool,

providing both motivation to study and "hands-on experience" in the practice of international

relations.

Figure 4. Screen capture from Middle Eastern Politics Simulation when running at

Macquarie University, Australia

MEPS was designed for undergraduate or postgraduate students studying the Middle

East, terrorism, international relations, history, or journalism. Students were divided into

teams playing a real person involved in Middle Eastern politics including journalists, and

over four weeks responded to a likely political scenario, set four weeks into the future, in

order to further their role's interest. Therefore, the scenario at the end often closely mirrored

current events in the real world. It was played in the students' own time via simulated

mechanisms of asynchronous e-mail and synchronous chat-rooms. It concluded with a real-time conference of three to four hours, framed as a UN Peace Conference, which addressed the issues that the students have been discussing in the preceding weeks.

MEPS was normally run as a partnership between Vincent's Australian university and one American university. One time, Vincent tried it with three universities, adding a Middle Eastern university. It was used in second year, third year and postgraduate politics courses. Teams playing one role were in the same university, not split across the universities. The role play at times had 40 roles in it and accommodated around110 students, making it one of the largest online role plays in the EnROLE repository. Since Vincent's death in 2008, MEPS has continued as an inter-university collaboration within Australia only.

As illustrated in Figure 3, this role play design was replicated by many other teachers in Australia. Mekong e-Sim (McLaughlan et al, 2001) is one of the most notable since it also has a sustained history. Through the work of Linser, one of Vincent's tutors for a number of years, the role play design was also replicated internationally, in defence force training as well as in universities (Linser, Naidu & Ip, 1999), supported by an online platform called *Fablusi,* developed by Ip.

Figure 5 lists Australian and international examples of online role play tracked by the author for twenty years. The wealth of Australian examples compared to examples from other countries is one indicator of the difficulties caused by different terminology referred to in an earlier section of this paper. However, it can also be inferred that online role play, in the format represented by Figure 2 and using technologies such as email and discussion forum, is an Australian design not often seen elsewhere in the world.

To illustrate how preferences for different types of technology (and access to higher levels of funding) might be a factor influencing inter-country difference in design, five further examples of role plays have been selected from Figure 5, for fuller description in the

following sections of this paper: Scarlet Letter, Save Wallaby Forest, Youtopia, Virtual Peace

and Virtual Patient. This international sample represents the different trends in role-based e-

learning design the author perceives in different countries of the world. The examples also

serve to highlight differences in the learning design of role play compared to the learning

design of simulation.

Table 2

Catalogue of Australian and international online role plays (from Wills et al, 2009, p.13)

Australia by states			
New South Wales	Victoria	South Australia	International
A Conversation Between Educationalists (UTS)	A Different Lunch (UMelb)	AIT Xmas Party (TAFESA)	Afghanistan Peacebuilding (Wichita, US & Carleton, Canada)
Australian Politics (Mq)	Allied Health (UMelb/St Vincent's Hospital)	At Risk (TAFESA)	Ardcolloch (Warwick & Strathclyde, UK)
Banking Law (UOW)	Asia Pacific International Relation (UMelb)	Avian Flu (UniSA)	A Trip to Australia (Jaume I, Spain)
Beyond Oil (UNSW)	Australian Foreign Relation (UMelb)	Battery Hen (Adelaide) proposed	Black Blizzard (Hedmark, Denmark)
Big Paper eSim (UNSW)	Autism Education (Latrobe)	Contemporary Social Issues	Construction Law (Bath, UK)
Birds of Paradise (UOW)	Coffee Business (RMIT Vietnam)	(under construction, TAFESA)	Dental Amalgam eSim (Sharjah, UAE)
Buyat Bay Planning Meeting (UNSW)	Delicate Dining (RMIT)	CSI (TAFESA)	Difficult Behaviours (SIAST, Canada)
Campaign Journalism (Griffith)	DRALE (UMelb)	Dental Amalgam eSim (Adel)	EcoLicense (Secondary schools, Denmark)
Conference Lunch (UOW)	Fibco (RMIT)	Disaster Downunder (Adel)	Eighteenth Century Music (Chinese Uni Hong
Contaminated Sites (UTS)	Fire Services Simulation (Deakin)	Fashion House (TAFESA)	Kong)
Debate over Drugs (Newcastle)	Foochow Road Shanghai (UMelb)	GEAP International Homestay (Adel)	Ending Violence (Antwerp, Belgium)
Environmental Decision-making (Mq)	Globalisation and the Law (UMelb)	Gender Analysis (Flinders)	Expert Witness, (Portsmouth, UK)
Equity in Education (UOW)	Global Politics (UMelb)	Jatropha (Adelaide)	Holocaust (Caldwell CC, US)
First Fleet (UOW)	Islam and Political Activism (UMelb)	Shenzen eSim (TAFESA)	Justice in Rwanda (ISS, The Hague)
Fish in Hot Water (UNSW)	Keelbundoora (UMelb)	Transgenic Grapes (Adelaide)	No School Left Behind (Fablusi, Appalachian State
Global e-Sim (USyd)	Koori Health (UMelb)	Tattoo Parlour (Flinders)	Uni)
Halong Bay eSim (Mq)	Legal Ethics (UMelb and Monash)		Paklet (Postal Service, Denmark)
Idontgoto Uni (UOW)	Leadership Skills (La Trobe)		Paediatric Patient Management (UGhent, Belgium)
Interactive Whiteboards (Mq)	Living History (Deakin)	**Other States**	Perioperative Nursing (SIAST, Canada)
Internet Gambling (UOW)	Managing Change (Fablusi)		Perspectives to Conflict Resolution (Fablusi, Tel
Katalonia (UTS)	Mediation Fishbowl (RMIT)	AUQA Audit (CQU)	Aviv Uni)
LegSim (USyd)	MOOing in Educational Practice (RMIT)	Bluewaters Project (UWA)	Pharmaceutical Care (UGhent, Belgium)
Pacifica (UNSW)	Negotiation (student designed role plays, RMIT)	German Cinema (UWA)	Scarlet Letter (Caldwell CC, US)
Public Planning Enquiry (Mq)	PBL & Engineering Practice (Fablusi, VU)	Include a Dude (Canberra)	Small Island States (Open Uni, UK)
RFID: Airport Security (UOW)	Power in International Relation (UMelb)	NeedleStick (USQ)	Task Force on Distance Learning (Fablusi,
RiftRaft (UTS)	Russian Politics (UMelb)	OHS in Mining (CQU)	Appalachian Uni)
Securities Market Regulation (UTS)	Save Wallaby Forest (Deakin)	Star Academy Critique (UWA)	US Senate (Maryland, US)
Talking out of School (UNSW and UOW)	The Campaign (UMelb)	UN Security Council (UWA)	Venezuela (Wales, UK)
The Buying Game (USyd)	Virtual Tokyo Campus (RMIT)	Werewolf (UWA)	Ward Management (Glasgow NC, UK)
The Pitch (USyd)	Virtual Print Room (RMIT)		War Supply Chain (US Army War College)
The Education of Gerry: Project Mgt (UOW)	WeSell (RMIT)		Youtopia (Nanyang Tech)
Transnational Crime Prevention (UOW)	World Politics in Transition (UMelb)		
Turning Point eSim (UNSW)			
UFY Contract Law (UNSW)			
Working Man's Paradise (UOW)			

US Example 1: Scarlet Letter

This online role play (Noggle, 2005) teaches students about the early American novel

The Scarlet Letter (Hawthorne) by placing them directly into the conflict of the story as

characters from the novel. Students acquire a deeper understanding of character, theme, language and historical perspective. The role play is set within the historical framework of the novel (America in the mid 1600s) with first phase beginning in 1649 triggered by a kick-start episode projected from the events of the novel. The second phase advances the storyline fifteen years in order to incorporate events leading up to the Boston witch trials of 1665. Setting the second kick-start episode fifteen years later introduces students to other historical developments that will serve as background for later literary works, such as Michael Wigglesworth's *The Day of Doom* and Cotton Mather's *Wonders of the Invisible World*, also studied in the course.

 The Scarlet Letter is embedded as a four week activity within an American Literature course at Caldwell Community College & Technical Institute, Hudson, North Carolina, USA. As first run in 2005, participants were placed in teams of two to three players and assumed the identity of one of ten roles, totalling 20 – 30 students in a single world. The role play can be run simultaneously in parallel worlds and/or use smaller or larger teams to accommodate various cohort sizes. Interaction spaces relate to spaces described in the novel. The forest scene, the governor's mansion, and the meeting house, among others, serve as areas to intermingle, further developing the plot. These spaces are designed for private reflection and public interaction.

 The learning design for the Scarlet Letter online role play follows the learning design illustrated in Figure 2. However, since there are fewer roles, it is not as complex, or perhaps daunting for the teacher, as the first Australian online role play with 70 roles: Middle Eastern Politics.

Australian Example 2: Save Wallaby Forest

 The next example, from Australia, also follows the generic learning design in Figure 2, but in a simpler format since it uses only two roles. Half the class represents a property

development company. The other half of the class represents a community action group. These two examples represent either end of an enormous range of design decisions to be made by a lecturer selecting role-based e-learning designs for their teaching. Wills (2010) documents 77 of these design decisions under eight main headings (Wills, Leigh & Ip, 2011).

This example also serves to demonstrate the differences between online role play and simulation because Save Wallaby Forest was first developed as an online role play for a Public Relations course at Deakin University (Demetrious, 2004) and later re-developed as an e-simulation PRessure Point! Getting Framed (Demetrious, 2007) for the same course. The course investigates the theoretical frameworks of pluralism and Marxism and in the role play students adopt one of those perspectives along with the role of either property developer or environmental activist. Participation is anonymous in order to foster greater involvement. The role play begins with a four-minute trigger video clip which sets the scene about a particular imaginary environmental dispute at Wallaby Forest. The separate groups of property developers and environmental activists are provided with further 'private information', a detailed 'role profile' description, and a group task to complete which is a 500-word speech to post at a public meeting. After posting, the two groups critique each others position. The online participation, which took between four to ten hours over several weeks, plus the essay, contributed to 40% of students overall mark. (Demetrious, 2004)

The designer of both the role play and e-simulation explains the differing learning outcomes from the differing learning environments, justifying her decision to build an alternative learning design:

> In my experience, the exciting pedagogical dynamics of the online role-play also place unexpected demands on both teachers and learners. Students' capacity to participate fully in the exercise can be affected by such things as distance for example, students that are located in different time-zones, or by an unwillingness to

commit. Furthermore, like most group-work, Save Wallaby Forest is subject to the

sometimes unpredictable social processes of membership formation that may affect

the extent of a participant's inclusion or exclusion. Indeed, these dynamic and

problematic factors influenced my decision to offer online role-play in the post-

graduate study area of Deakin University where smaller cohorts of around 40-50

students were a more manageable size for the learning activity. PRessure Point! GF,

while based around similar learning themes as Save Wallaby Forest, was developed

for large undergraduate cohorts where students interact with the technology as
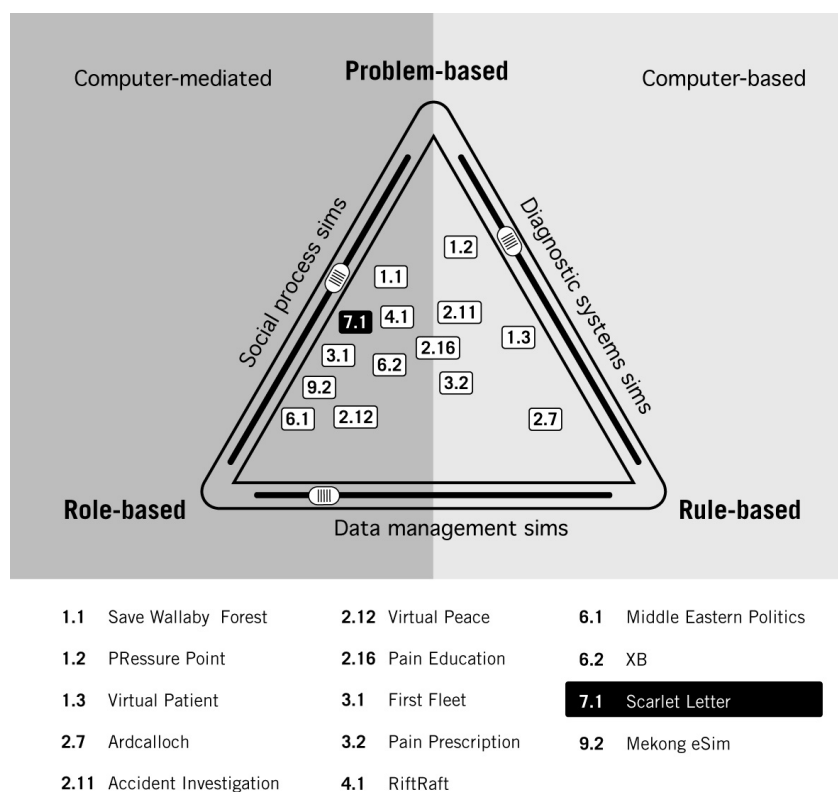
individuals. (Demetrious, 2007, p.189-90)

The e-simulation uses the same story and characters that were developed in Save

Wallaby Forest, but puts students in virtual workplaces, with a deadline and task to complete.

The different technology used to create the e-simulation is much more complex than the

standard online discussion forums used for online role plays but opens up other possibilities

and takes some new directions.

Determining the differences and similarities between online role play and simulation

was one of the catalysts for selecting "role-based e-learning" as the name to define a broader,

more inclusive area of e-learning activity, described earlier in this paper.

Role Play Versus Simulation

In the e-simulation one student adopts a role to interact *with* a computer. In the online

role play students adopt a role to interact with each other *via* the computer. Online role play

provides a scenario for the action and a set of roles that participants adopt in order to solve a

problem collaboratively, create something new, or explore an issue. Save Wallaby Forest and

PRessure Point! are both examples of "role-based e-learning" but they differ in the amount of

emphasis placed on interaction between roles.

The Simulation Triad (Figure 5) was developed by the author to represent these differences and similarities. It takes as its starting point that all simulations involve roles and rules and a problem. (Problems are sometimes called case, situation or scenario).

Figure 5. Situating online role play examples on the Simulation Triad. Triad sides are labelled using categories from Gredler (1992). Descriptions of examples are available on Project EnROLE website enrole.uow.edu.au

The Triad utilizes a slider metaphor on each of the three sides to indicate a continuum. The Triad is a framework that recognizes design decisions according to the amount of emphasis put on Roles versus Problem versus Rules. Some of Gredler's terminology for simulation categories (1992) has been adapted to label the three sides of the Triad. In Figure 6 the position of the sliders on each side dictates that Scarlet Letter would be the example of role-based e-learning that best fits the three variables. Similarly, the first two Australian examples, Save Wallaby Forest and Middle Eastern Politics belong along the problem-roles

continuum, varying from Scarlet Letter in the number of roles. By contrast, the design of PRessure Point! places it along the problem-rules continuum.

According to the taxonomy of simulations developed by Gredler, the first two Australian examples fall into the category of multi-agenda/social-system/social-process simulations because "…participants assume roles in a hypothesized social group and experience the complexity of establishing and implementing particular goals within the fabric established by the system. The differences and potential conflicts among the roles set in motion the dynamics..." (p.102)

PRessure Point! would be categorised by Gredler as a diagnostic systems simulation and other business simulation examples such as Ardcalloch (Barton, McKellar & Maharg, 2007), a legal transaction simulation developed in the UK, would be closer to her third category of data management simulation.

American Example 2: Virtual Peace[6]

More recent online role plays are experimenting with new technologies which are highly visual and highly immersive such as Lenoir & Herron's Virtual Peace at Duke University (see Figure 6). In the role play, based on real life, there is a major international emergency following Hurricane Mitch. The region is devastated. In particular, two countries – Nicaragua and Honduras – are affected most drastically and need urgent assistance. Students representing governments, UN and bilateral agencies, and NGOs meet (virtually) to provide assistance. The effectiveness of assistance requires intensive planning, coordination, collaboration, and diplomacy, as well as an awareness of the limitations of time and

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[6] Edited from a description provided by Tim Lenoir & Patrick Herron for

http://enrole.uow.edu.au   – see also http://www.virtualpeace.org

resources. Honduras and Nicaragua are in dire need of immediate international aid, but that aid has to be provided in such a way as to put in place a sustainable recovery program.

On entering the online role play, participants are immediately, viscerally engaged with the effects of the hurricane, as what was previously only text and data becomes film and audio of real events. An opening montage introduces the disaster.

Participants, who have learned about their roles in advance, represent 20 different organizations. Their task is to negotiate the specific commitments of cash, in-kind and personnel donations that will address immediate needs such as medical assistance, security, water, shelter and food. They also respond to larger issues such as logistical coordination and political rehabilitation.

Before entering the online role play, participants use the website to gain essential information, including specific details about the extent of the hurricane's devastation, the needs of the affected people, and the goals of and resources available to their particular governmental or organizational roles, as well as links to important international aid documents. In the two-hour live simulation session, they will interact with one another to achieve successful relief and recovery for the affected people in a way that will best reflect the values and goals – from immediate hunger and medical relief to long-term, sustainable rebuilding plans – of the collaborating governments and organizations.

Each participant assumes a role by way of a first-person perspective avatar designed to look like real figures in the international aid community. Wearing a head-set with microphone, they talk via voice- and text-channels within the game-space, which is designed to look much like the real venues where these representatives might convene. During the session, virtual tools keep track of needs-met in real-time updates of a chart of commitments, and of the dialogue among the participating parties.

Classes of 16 to 20 participants adopt one role each, presenting their views to the group at large, and then breaking out into smaller groups for planning and negotiations. During the two-hour role play, moderators can "fly" around to observe the conversations and send "curveball" messages to particular participants to simulate unexpected crises. Participants and moderators are able to digitally bookmark important events. Afterwards, together, they dissect the simulated experience in order to chart successes and teachable moments, and to ultimately emerge prepared for actual crisis response. Together they can assess whether important goals were met, if participants properly represented the values and practices of their government or organization, and how they could work more effectively in the future.

Figure 6. Screen from Virtual Peace, Duke University, USA

This role play enables learners to use voice and body language as well as text to convey their role's input to the topic under discussion. However this also means that the role play is conducted in real time and thus places the same demands (and stresses) on learners as face-to-face role play does. In synchronous modes of interaction, learners are required to respond immediately whilst at the same time maintaining their role. Some learners find this daunting and it may not be necessary for all learning contexts. The visually immersive nature of *Second Life* is very appealing and is a powerful aid to role adoption. However its emphasis

on real-time interaction between roles can make it a less flexible or supportive environment than that experienced in more reflective role plays conducted asynchronously over a number of weeks. The asynchronous technologies provide time for learners to consider their responses and the inputs of other roles and may provide for a more reflective learning experience.

It is clear that the use of 3D virtual worlds as a platform has dominated the examples collected by the author (up till 2009) for America, Britain and Asia, in contrast to the simpler technologies supporting the wealth of Australian examples. In the main, 3D worlds are being used for simulation rather than role play as defined in Figure 1.

Hew and Cheung (2010) suggested there are three types of virtual worlds: communicative, spatial and experiential. Role play in a 3D virtual world would cover all three types. However the majority of examples so far do not involve in-role interaction between roles. Communicating via an avatar which represents, or deliberately *mis*-represents, the identity of the user is not the same as placing the student in someone else's shoes to solve a problem. It is easy to imagine that role play can be conducted in 3D virtual worlds. However, to date the focus has been on building the spaces and contexts (rules) rather than problems and roles as illustrated in the Simulation Triad.

British Example: Virtual Patient

A British example of 3D virtual worlds is University of Leicester's SWIFT project. It is focussed on developing science laboratory simulations in *Second Life* but is also investigating adding a role play layer to explore ethics issues related to science experiments (Cashmore *et al.*, 2007). Another British example which is described in more detail in this section is Virtual Patient developed at Glasgow Caledonian University. Using *Second Life* for simulating virtual patients, the example is situated elsewhere on the continuum mentioned above.

Figure 7. Screen from Virtual Patient, Glasgow Caledonian University, UK

In Virtual Patient a number of avatars have been created as simulated patients each with a condition that nursing students need to be able to diagnose. For example, Heart Bot (Figure 7) is an avatar that has heart problems. Traditionally, diagnosis practice for medical professionals is provided through volunteers who play patients according to a case they are given. Using avatars means that volunteer patient actors can be used at a distance and need not come into the university. The student, role playing the professional they are training to become, interacts with a patient who is being played by a volunteer. There is no interaction with other students in the class, although one can imagine a design that could encompass that, depending on the learning objectives.

This application is best classified as a rule-based simulation rather than a role-based simulation because the only role is the professional one that the learner is training to become. However such environments show potential for expanding the horizons of role-based e-learning by providing ever more vivid virtual worlds with the overlay of augmented reality, audio, gesture-based computing, and data visualization tools. Combined as well with the anywhere access afforded by mobile computing, future online role plays provided by training organizations and universities for learners will likely be highly rich and intense educational experiences.

Singapore Example: Youtopia

One early example of this trend for 3D virtual worlds is an online role play developed by Jamaludin and colleagues (Jamaludin, 2007) at Nanyang Technological University in Singapore for an A-level subject to provide students with practice in argumentative writing. Using a private *Second Life* island called Waga Waga, a context for the topic of globalization was created, with five interest groups: native peasants, women peasants, International Monetary Fund, a non-governmental organization, and a multi-national corporation. The settings for the five groups were designed to convey their differing status, power, and resources. Members from these five different parties attempt to establish an alliance after decades of totalitarian government. Students' participation in the role play was complemented by use of a web-based structured argumentation tool, Voices of Reason (Jamaludin, 2007), which tutored them on forms of appropriate sentence openers around elements such as claim, grounds, qualifier, warrant, backing and rebuttal.

Second Life and 3D Virtual Worlds

Most universities around the world are exploring applications of *Second Life* (Salmon, 2009) and some are looking at role play as one of the *Second Life* designs. For example, Hong Kong Polytechnic University has a *Second Life* project (Figure 8) to explore ways the environment can support learning: online role play is one of the modes they are encouraging and supporting by providing tools and templates for *Second Life* role plays.

While choices about technology will continue to depend on decisions about learning objectives, role play in 3D virtual worlds such as *Second Life* places similar demands on students as face-to-face role play. It is live, in real-time and thereby the benefit of asynchronous reflection is lost. For some learning objectives, this real-time immediate response from students interacting may however be very appropriate. Future trends are most likely to blend the two ends of this continuum, balancing the needs of the learner for any-time

any-place learning with educational needs for real-time interaction. Meanwhile new designers

of role play should examine the assumptions contained within the technology choice before

leaping into new technologies just because they are new and appealing.

Figure 8. Second Life Project, Hong Kong Polytechnic University[7]

Selecting Technology for Role Play

One way to determine technology's potential for role-based e-learning is to examine it

in relation to the following three dimensions of a learning design: time, group and

environment. The time dimension is concerned with how the technology will influence the

response time expected from the learners. For example, *Second Life* requires learners to be

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[7] screen shot by Jackie Kwong; classroom shot by Jovi Liu

responding in near real time providing opportunities for impromptu actions. On the other hand, forward and store services, such as email, provide opportunities for reflection, research and collaborative brainstorming. The second dimension concerns the way technology influences learning group dynamics. Whilst any learning design must promote individual learning, it should also enhance collaborative work. Some *Second Life* designs are only about the individual interacting with the information or the environment rather than interaction with the other learners.
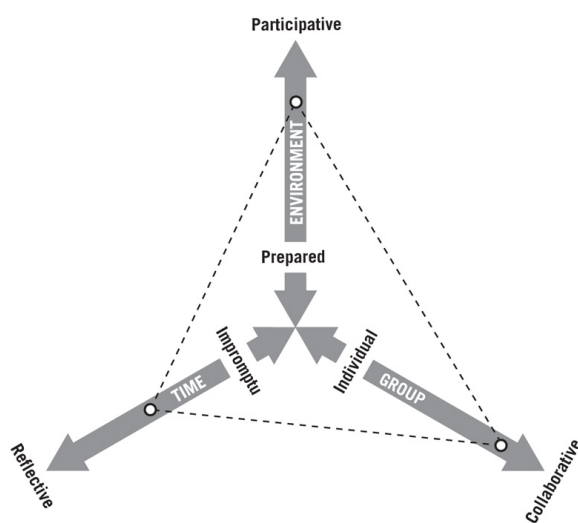

Figure 9: Three dimensions for understanding technology functions in role-based e-learning (Wills, Leigh & Ip, 2011)

The third dimension concerns how the environment is developed. At the present time, the virtual spaces created in *Second Life* are of necessity prepared with institutional authority, due to cost and time. In Graphics and Design courses there have been cases of learners creating visual representations of their context. However, in online role play the time taken up with learner-designed environments may interfere with the main learning objectives.

Figure 9 presents these three dimensions as related and maps a hypothetical online role play against those dimensions. Virtual Peace would be towards the centre on two out of three of the dimensions. Diplomatic Encounters shown in Figure 1 would be on the outer edge for all three dimensions.

Inter-country Comparison

Australia has led the way for the past 20 years with innovative learning designs for online play. This growth was based on a solid example exhibiting pedagogical soundness and demonstrating sustainability. The technologies of 20 years ago were also sound and now have proven stability and low entry cost. However, newer technologies are emerging and these technologies dominate the examples of role-based e-learning cited from other parts of the world.

Table 3

Comparison of role play examples by country and technology

Role play name	Country	Technology
Diplomatic Encounters	Australia	Discussion forum
Middle Eastern Politics	Australia	Discussion forum
Scarlet Letter	USA	Discussion forum
Save Wallaby Forest	Australia	Discussion forum
PRessure Point	Australia	Online simulation
Virtual Peace	USA	3D virtual world
SWIFT & MOOSE	UK	3D virtual world
Virtual Patient	UK	3D virtual world
Youtopia	Singapore	3D virtual world
Second Life Project	Hong Kong	3D virtual world

The advantages and disadvantages of the newer technologies for role-based e-learning have been discussed for each example. It was noted that examples in 3D virtual worlds tend not yet to be fully-fledged online role plays. Perhaps energy that should be spent on designing

a rich problem and fleshed out roles has been diverted into designing visually immersive places and contexts.

In the past two years, many Australian universities have now started using 3D virtual worlds[8] as evidenced in the results of a national scoping study funded by ALTC (Dalgarno et al, 2010). Some of these 3D virtual worlds are used for role-based e-learning but none have yet scaled up to match the standard set by the first Australian online role play: Middle Eastern Politics. This first example has not yet been matched either in its commitment to inter-country collaboration with students in teams across the world working to propose solutions to world peace.

Conclusion

This paper has covered the history and theoretical underpinnings of the emerging field of role-based e-learning. It describes a number of examples of online role plays and presents a taxonomy for categorising online role plays and e-simulations. It discusses some of the issues faced by academics designing and implementing online role plays for their university courses.

The author hopes that readers will be enticed to experiment with this different design for teaching in the e-world. As people are increasingly able to create and publish resources online themselves there is also potential to incorporate artefacts created by participants themselves into the role play as it develops, creating an even more dynamic, blended e-learning experience for learners.

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[8] DEHub Virtual Worlds Working Group http://virtualworldsworkinggroup.wikispaces.com/

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