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Online role-play environments for higher education

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Abstract
As online environments and tools have evolved over the last 15–20 years, their use for role-based learning has expanded. This analysis draws on work for an Australian project that has been sharing and developing knowledge about the use of online role-plays in higher education. We describe the learning needs that online role-play can meet, and give examples of solutions—some using custom-built software and some using standard online learning environments. We use these examples to develop a framework for evaluating how new technologies can support role-based learning activities in universities, taking into account the needs of both learners and teachers.

Introduction

Role-play is a form of experiential learning where students adopt different personas and work through a given scenario together, interacting in their assumed roles. Role-play is particularly effective for learning about complex social/human systems. In online environments, which are growing in number, diversity and availability, students can interact anonymously, in role. The EnROLE (Encouraging Role-based Online Learning Environments) project (Wills *et al*, 2009) brought together experience of online role-play designs, environments and tools going back to 1990.

In universities, online role-play learning is part of a complex adaptive system. Institutional and disciplinary contexts influence the academic organising processes by which new forms of learning activity and new web-based learning technologies develop and spread (Russell, 2009)—see Figure 1.

Project EnROLE uses the following specific definition of online role-play:

'Online (and blended) role-plays are 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;
- to do authentic tasks in an authentic context;
- involving substantial in-role human interaction such as collaboration, negotiation, debate.

Interaction between roles is substantially in an online environment. Learning outcomes are assessable and generate opportunities for student reflection'. (Wills *et al*, 2009)

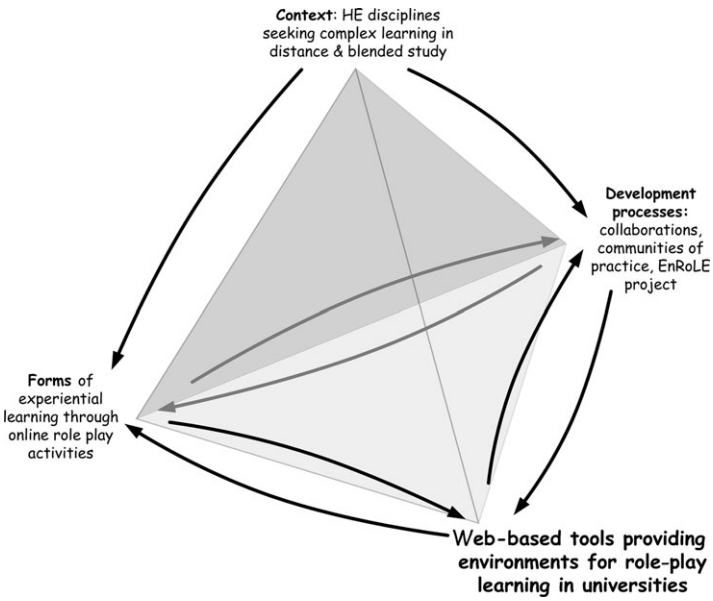

Figure 1: Online role-play environments as part of a complex adaptive system based on Russell (2009)

In this paper, we focus on the web-based tools used for online role-play learning in universities and identify some key interdependencies between technologies and their effectiveness for this type of experiential learning.

The educational context

Role-play learning takes the student through stages in an experiential learning cycle (Kolb, 1984)—action, experience, reflection, theory. However, the Kolb cycle describes individual learning and implies conscious development of abstract concepts. Although conscious theorising is part of university education, it does not always happen in professional practice.

For the reflective practitioner (Schön, 1983), professional learning is acquired implicitly as well as explicitly. Implicit learning relies on a stance of reflective imitation, and temporary suspension of disbelief, rather than deliberate learning of concepts. Role-plays are ideal for encouraging this type of complex holistic social learning experience. Although some professional skills learned in this way could remain as tacit knowledge, academic assessment of learning in universities requires conscious reflection, analysis and explicit communication of what has been learnt.

So, two fundamental design criteria for online role-play platforms in universities are to:

1. create a space for complex social learning;
2. support explicit reflection and theorising as part of the role-play activity.

Teaching, facilitation and scaffolding

Learning from experience can be risky, and another advantage of role-play over reality is that the students can learn in a supported environment before they launch themselves into deep professional waters. This brings in three more design parameters.

3. How a teacher or facilitator guides the process and sets boundaries

Although we are focusing on technology, facilitation also needs to be part of the technological design. For example, Salmon (2000) suggests that any online learning activity will require extra facilitation in the earlier stages of access and socialisation.

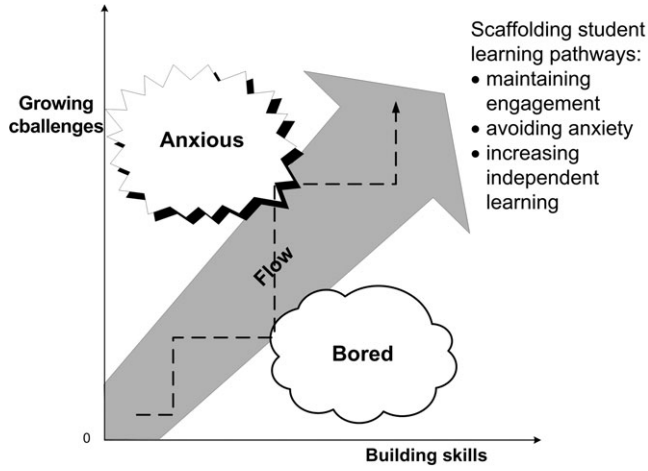

Figure 2: Scaffolding in the ideal role-play environment: keeping students in the 'flow zone'

4. How the technological environment pre-structures the learning experience

Synchronous and asynchronous communication tools, shared online work spaces for groups, resource banks to explore further information about a problem, all scaffold different types of cognitive process (McLoughlin & Luca, 2002).

5. Degree of independent learning expected

At one extreme, the students might be launched into a substantial scenario with large amounts of unstructured information and left to find their own way through the situation, in role. At the other extreme, the students might be given small parts of a problem situation to deal with, one at a time, each supported by highly specific resources, as they build confidence and skill. The online environment and tools can shape the granularity of the resources and support, which should match the task structure (McLoughlin, 2002). The ideal role-play learning environment would keep most of the participants in their 'flow zone' (Csikszentmihalyi, 1992) by building skills and growing challenges together (Figure 2)—neither boring them with routine skill building so that they become disengaged, nor giving them challenges they cannot cope with so that they become overanxious and stop learning.

Games, simulations and role-plays

Because games, simulations and role-plays can all be used for experiential learning, it is useful to clarify the similarities and differences.

Games

A game is a constructed situation in which players make efforts to win within defined rules. Academic games can be designed to develop particular skills, such as information recall, learning concepts or rules and solving problems (Gredler, 1992). Games can help motivate and engage students in developing skills by presenting artificial challenges that keep them in the flow zone.

Simulations

Simulations differ from games in that the former aim to model how a complex reality functions, and present participants with a realistic problem to solve (Gredler, 1992).

Computer simulations have been used for learning since the 1970s, when the time to receive the simulation response could be several weeks. In the 21st century, simulations and games can

include much more complexity, speed of response and realism. But they do not necessarily support online role-based learning, as defined previously. In some management games, participants play roles and interact with each other, but the dynamics of their interaction depends mainly on the rules and modelling built into the simulation.

Role-play

In a role-play, learning takes place through identification with a character in a social context. This means that, instead of providing ready-made characters in detail, as with 3D avatars in virtual worlds, it is better to leave room for the learners' own imaginative elaborations so that they are intellectually and emotionally active in the construction of their roles (Linser & Ip, 2005).

Gredler (1992) divides simulations into two main categories:

- *Tactical decision simulations* focus on analysing data and on achieving particular outcomes from the decisions based on that analysis. The learning outcomes are capabilities in data selection, organisation, interpretation and management.
- *Social process simulations* focus on interactions among people and how their beliefs, assumptions, goals and actions influence decisions. The learning outcomes are the ability to work in social systems, to build insight or empathy or to develop communication skills.

Although Gredler does not include role-plays in either of those categories, social process simulations provide the same advantages that van-Ments ascribes to role-play: 'It is an excellent way of developing interpersonal and communication skills and provides highly motivating and memorable lessons ... in any area where human interaction is paramount' (van-Ments, 1989, p. 37).

Online role-play simulations, as defined in Project EnROLE, include social process simulations, but not tactical decision simulations. This is important for the selection of online tools and environments for role-play because it implies providing support for realistically complex interaction between the roles, rather than building sophisticated models that generate experiences (data) for the student to analyse.

Some massively multiplayer online role-playing games have potential for educational simulations and 'serious' gaming (De Freitas & Griffiths, 2007). They can also be used as role-play environments, if there is sufficient scope for imaginative role construction, collaboration, negotiation and debate.

Rather than propose strict definitional boundaries, we therefore suggest that there is a continuum, in which online role-play may involve a simulated problem context and also analysis of related data, but where the focus of learning is on how the roles interact in dealing with the problem. Wills (in Wills *et al*, 2009, p. 10) draws on several potential role-play examples in the UK to create a triad framework (Figure 3) in which to position this emerging type of simulation alongside the many other role-based learning environments that Project EnROLE has catalogued.

Role-play requirements

For role-plays, the online environments and tools need to support:

- direct social interaction among participants (rather than interaction with, or mediated by, a computer model);
- student involvement in building or elaborating the roles they are to assume (rather than having these pre-programmed in detail);
- student exploration of a complex scenario that requires resolution through discussion, debate and negotiation among roles with differing points of view.

Role-play learning also requires student debriefing and reflection. Where the online environment is used in blended mode and primarily to support anonymity in role, the debriefing, reflection and

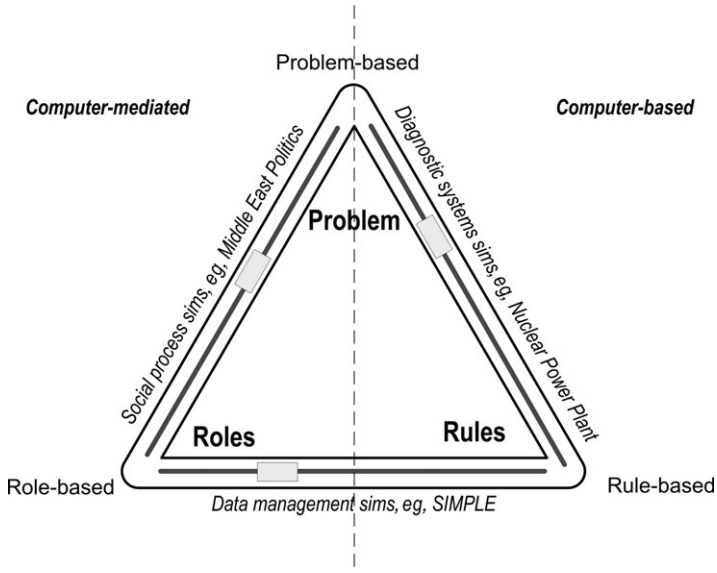

Figure 3: Simulation and role-play continuum (Wills *et al*, 2009)

theorising can take place face-to-face. Students can also articulate in written work their individual theorising on the role-play experience. However, the online environment can support monitoring, recording and analysis of actions (Salmon, 2001) in a much more detailed way than is usually possible in a face-to-face role-play.

Role-play environments in practice

The real examples of online role-plays logged by Project EnROLE use a variety of environments and tools, some of which evolved through a complex iterative process. Before the advent of online learning management systems (LMS) and tools, custom-built environments were the only option.

Customised environments

Online role-play environment (ORE)

ORE arose from collaboration between a politics lecturer and a computer science lecturer in 1990 in the University of Melbourne and since then has grown to support several other role-plays (Vincent & Shepherd, 1998). The environment was originally set up to develop students' appreciation of the political complexities underlying news reports on relations between Middle Eastern countries and the US. Students take on the roles of politicians and journalists in various countries and send public and private communications to the other roles. Early version of the system were called MEPS, short for "Middle East Role-play Simulation".

Version 1 (1989): Emails (representing political communiqués, press releases and published articles) were all sent to a central address and redirected manually.

Version 2 (1990–97): A mail alias system replaced manual email redirection, mapping role addresses to student email accounts. However, students still had to log in to an online account with their own IDs.

Version 3 1998 to present: A web application was written to manage the functionality for the simulation. The current system has tools to support role development and preparation activity in groups, in-role communiqués (by email to other roles) and public announcements to all roles

(simulating press coverage). However, there is no threaded asynchronous discussion, no embedded support for debriefing and no web interface for setting up roles and scenarios.

Version 4 will address some of these deficiencies. However, there are now several other environments for online role-play developers to choose from. The current version is informally managed and is available for use, from a server in University of New South Wales, on request.

Fablusi—generic role-play environment

Fablusi is a generic role-play environment developed in the mid-1990s after some experience with early online role-plays. It has a built-in design process and allows for multiple simulations. Its communication tools include forums (spaces) to provide asynchronous broadcast within small groups. Pre-allocation of students to roles and student selection of roles are both possible. *Fablusi* is run as an independent commercial educational service.

Project ICONS

ICONS (*International Communication and Negotiation Simulations*) runs from the University of Maryland in the USA. It is a custom-built online environment that includes tools for synchronous and asynchronous communication, collaboration in groups, team voting and support for out-of-role debriefing. Many of the examples listed on the website (http://www.icons.umd.edu/highered/home) for university-level study are associated with political contexts and are available for reuse, complete with resources. The project charges for use of these simulations, per student user.

Simulation builder

Academics in the University of Western Australia have an internal service to help them design and set up online role-plays, using an in-house *Simulation Builder*. Like ORE, this requires educational technologists or programmers to set up the simulations, and is not designed for academics to use directly to set up their own role-play activities.

SIMPLE

The University of Strathclyde, with external project funding and in collaboration with other UK universities, has developed an open source *SIMulated Professional Learning Environment* (*SIMPLE*)—with built-in resources to create a virtual town and a virtual office. The environment supports group and individual learning activities, and assessment. (Hughes, Gould, McKellar, Maharg & Nicol, 2008).

Standard LMS

An increasing number of online role-plays are being built using standard LMS such as *BlackBoard* and *Moodle.* For university lecturers, the institutional LMS is free, accessible to all staff and students, and usually integrated with student and staff administration systems. The use of standard online environments and tools means that role-play designs transfer easily between institutions and disciplines, as shown by the two Australian examples illustrated in Figure 4.

Mekong e-Sim

The *Mekong e-Sim* role-play consists of a realistic and highly structured scenario—a proposed development in the Mekong River basin in Southeast Asia in the context of a public inquiry. A series of unfolding events is simulated using conditional and timed release of materials. The students are required to interact with each other, in role, to deal with the scenario as it develops. The whole simulation runs on a standard LMS, with student login in role. However, in some institutions, there have been administrative barriers to setting up these role-based login IDs.

Round table

The *Round Table* role-play has a simple format, in which professional stakeholders meet in an online asynchronous discussion forum representing a face-to-face meeting. The participants each

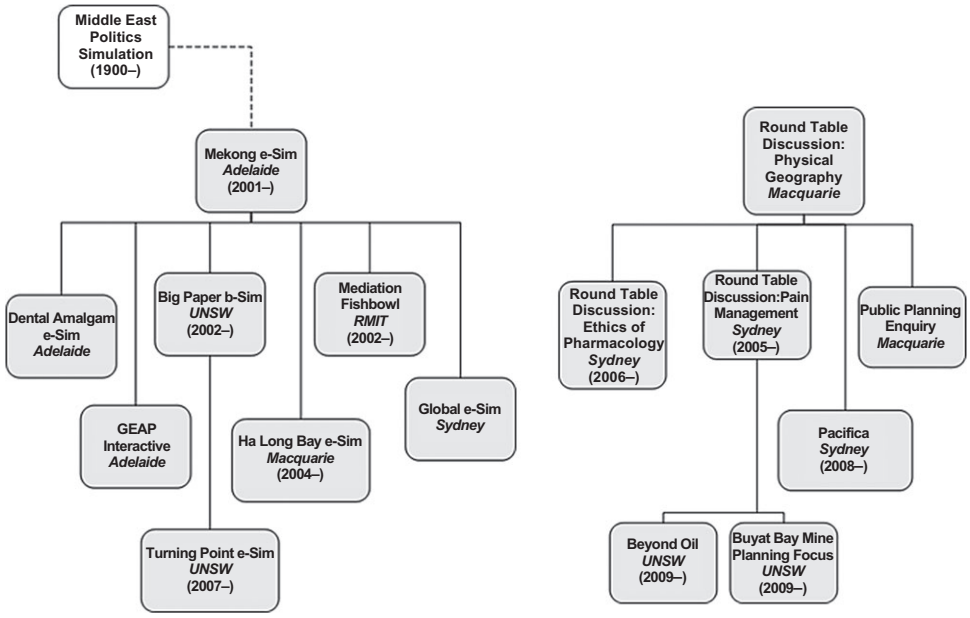

Figure 4: Mekong e-Sim and Round Table role-play 'family trees' (Wills *et al*, 2009)

present a prepared statement or position to the meeting, and then exchange questions and answers. One of the descendents of this model is a joint role-play for two postgraduate courses, in Mining Engineering and Public Health. Each course already has its own online course in the institutional LMS and log in to a separate *Moodle* environment in role.

Virtual Reality (VR) and virtual worlds

UNSW has developed an immersive (3D surround vision and sound) simulation of mining environments (Stothard, Galvin & Fowler, 2004) for training miners about safety protocols rather than role-plays. Immersive virtual worlds (IVWs) such as *Second Life* seem to offer a similar, although less physically immersive environment, where students might experience interactions in role through an avatar (Jamaludin, Ho & Chee, 2007).

Virtual worlds are not yet a familiar tool for most academics, and it is not clear how their use for role-play might best be integrated with other university systems. One possible strategy might be to use the open source *Second Life* engine to create a reusable virtual world for role-plays—just as the *SIMPLE* project has created a virtual town and office. This could be added to and developed over time, and customised for links to institutional administrative systems. The *SLOODLE* project, for example, is building links between *Second Life* and *Moodle* (Livingstone, Kemp & Edgar, 2008)—a potential environment for role-play learning in virtual worlds, integrated with other university online learning activities, courses and student administration systems.

Discussion

The examples above show how the technology chosen to support online role-play learning is part of an adaptive system that includes not only the technological environment (tools available) but also the university learning context (discipline, level, organisational support and funding) (Figure 5).

The development of the ORE environment shows three very different underlying technologies supporting the same learning activity over many years. Apart from an initial grant to pay for

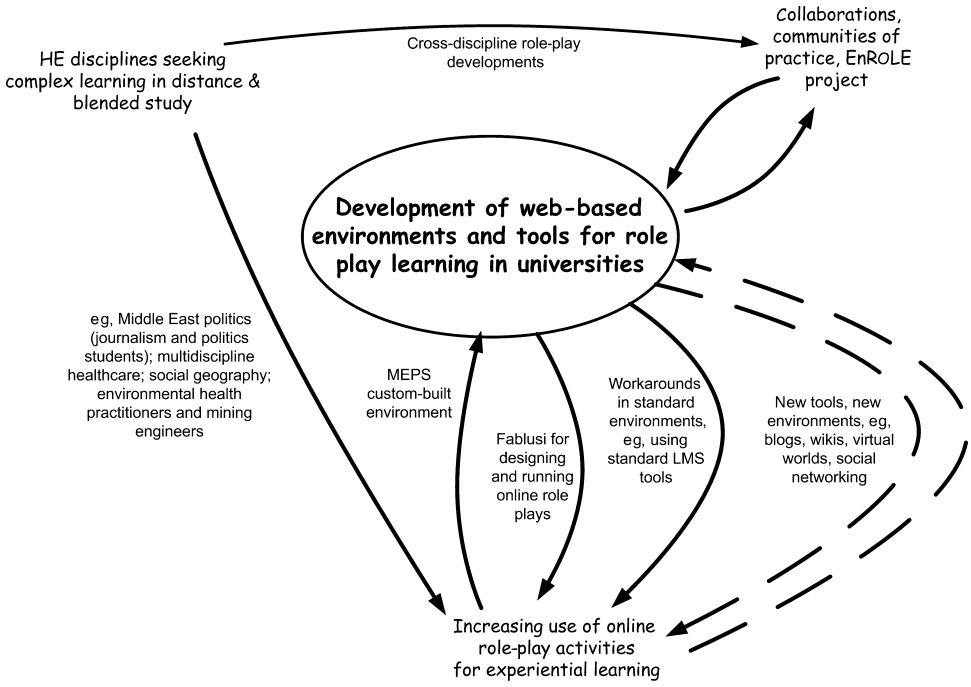

Figure 5: Role-play use and the available tools and environments for higher education (HE) disciplines

manual email redirection, ORE received no direct funding. Other customised environments for online role-play have had different funding models—national grants, institution-based funding and private funding—leading to different payment regimes for university users. What they have in common is a need either for effort and expertise to set them up, or for payment for use.

Off-the-shelf tools are becoming better able to support online role-play learning activities, without the need for specialist expertise. Most of our examples use Web 1.0 tools. A few are beginning to use social networking tools, and there is potential for using VR or immersive 3D virtual worlds.

Although newer environments, such as virtual worlds, seem immersive, it is not yet clear whether this helps or hinders student engagement with learning from the role. Linser and Ip (2005) suggest that ready-made realism detracts from students' active involvement in filling out their roles. One study showed that students who designed role-play simulations for their peers learnt more than those who performed the role-plays—confirming the 'listen and forget, see and remember, do and understand' adage (Druckman & Ebner, 2008). Yet there is no reason why students cannot build and elaborate on roles in IVWs—as many already do in online games.

In summary, from the learning perspective, new methods of providing students with an online environment in which they are present only in role have advantages, especially if students can contribute to the role description.

From the teaching perspective, there are still some barriers. Anonymity is hampered by institutional systems where student online access is locked into automated enrolment administration. For larger student groups, automation of the role allocation and login process would be essential, and this requires institutional investment. There are set-up costs for introducing such change,

and running costs in terms of staff time. Some of the customised environments have had considerable investment and/or require continued expert support of a type that has often not been available in Australian universities (Uys, Buchan & Ward, 2006). However, there are now many examples where online role-play uses established tools and builds on existing designs, with minimal investment and support.

We suggest that the following criteria might be applied to newer types of online environment to assess their usefulness as spaces for online role-play learning, with the weighting of each criterion depending on the specific learning context.

Learning

- immersion/authenticity: environment allows for activity in role without external distractions
- engagement with role: environment provides ways for student to build and inhabit roles
- anonymity: environment hides real identities of other players during role-play
- synchronous communication: chat, etc
- asynchronous communication: email, online discussion forums, etc
- group reflection: blogs, wikis, group discussion forums
- individual reflection: personal blogs, journals
- debriefing out of role: dual online identities (eg, separate authentication for role-plays)
- resources: material supporting role-play, eg, scenario, role briefs, background documents.

Teaching

- staff accessibility: available and familiar to all staff and supported institutionally
- student accessibility: available and familiar to students
- low role-play set-up costs/effort: few specialist skills and little time/cost to create each role-play
- low role-play running costs: routine activity management tasks minimised/automated
- activity tracking: tools for facilitators to monitor player actions
- activity structuring: tools for facilitators to shape and direct information for and communication among roles, eg, conditional release, threaded discussions, group tools.

Conclusions

Table 1 summarises our analysis and puts forward some tentative judgements on each environment type, based on the examples we have described. These criteria can be used to evaluate new environments and tools for role-based learning.

Instead of focusing on the potential of the newest environments, we developed this framework by analysing existing examples collected through Project EnROLE. The growth of web-based environments and tools for role-play learning in universities has entailed complex interaction between disciplinary learning needs, the technologies available and academic communities. The same underlying processes will be needed for effective use of newer technologies for online role-play—Web 2.0 tools, virtual worlds and whatever else comes along in the next 20 years.

As free web-based environments become more sophisticated, the affordances of online tools will become less important than how they are used. For example, one role-play used an asynchronous discussion forum for a synchronous role-play, to take advantage of the threading and tracking functions (Cornelius, Gordon & Harris, 2009). Environments such as *Second Life* and *Twitter* offer new possibilities for mixing synchronous and asynchronous interaction.

Not only is the range of online communication tools (synchronous and asynchronous, verbal and visual) expanding, but there are more tools for end-user customisation of virtual environments. So, before long, the distinction between customised online role-play environments and standard LMS environments could become irrelevant.

Table 1: Criteria for online role-play environments

	Environments					
Role-play criteria	*Classroom*	*Email*	*Custom web applications*	*Standard LMS tools*	*Web 2.0*	*Virtual worlds*
Learning						
Immersion/authenticity	X	X	✓	?	?	✓
Engagement with role	✓	✓	✓	✓	✓	?
Anonymity	X	✓	✓	✓	✓	✓
Synchronous comm.	✓	X	✓	✓	✓	✓
Asynchronous comm.	X	✓	✓	✓	✓	✓
Group reflection	✓	X	✓	✓	✓	✓
Individual reflection	✓	X	✓	✓	✓	?
Debriefing out of role	✓	X	✓	✓	✓	?
Resources	✓	X	✓	✓	✓	✓
Teaching						
Staff accessibility	✓	✓	✓	✓	?	?
Student accessibility	✓	✓	✓	✓	✓	?
Low set-up costs	✓	✓	?	✓	✓	?
Low running costs	X	X	?	✓	✓	?
Activity tracking	✓	✓	✓	✓	✓	?
Activity structuring	✓	X	✓	✓	✓	?

✓ We know of cases where an environment of this type supports the criterion.
? Environment may or may not support the criterion.
X Environment makes it difficult or impossible to meet this criterion.

Currently, some of the teaching criteria we have identified, such as staff accessibility and time/costs, are still in question. Even the basic function of anonymity, a well-established advantage of online environments, may be hampered by administrative rather than pedagogical or technical constraints. But if academic staff and university systems become as comfortable with virtual worlds as they currently are with emails, there is no reason why newer technologies cannot meet all of the learning and teaching criteria we have identified, especially active engagement of students in building their own roles.

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