

Epistemic games & applied drama: Converging conventions for serious play

David Cameron

University of Newcastle
Callaghan NSW 2308
Australia
david.cameron@newcastle.edu.au

John Carroll, Rebecca Wotzko

Charles Sturt University
Bathurst NSW 2795
Australia
jcarroll@csu.edu.au, rwotzko@csu.edu.au

ABSTRACT

This paper describes a way to bridge the remaining conceptual gap between the conventions of digital games and those of non-theatrical drama forms, particularly when both fields are applied to non-entertainment settings. The approaches and literature surrounding both David Williamson Shaffer's work in epistemic games and Dorothy Heathcote's work in applied drama are compared. The teaching strategies in both approaches use a range of dramatic techniques that engage students in learning tasks which involve solving problems, and producing working content as if the students were professionals in a particular field of expertise. The similarities between the two pedagogies allow designers of serious digital games to borrow from frameworks in applied drama to further develop authentic learning experiences. A case study examines the application of these two pedagogies in the design of a Web-based game engine for the delivery of training scenarios.

Keywords

Digital, epistemic, serious, games, applied drama, Mantle of the Expert, education

INTRODUCTION

Digital games and non-theatrical drama forms share similar strategies when applied to non-entertainment settings. These two practice-based pedagogies as discussed in this paper centre around David Williamson Shaffer's work in epistemic games and Dorothy Heathcote's work in applied drama. Both approaches aim to deliver student-centred curriculum content through specific learning theories. The scholarly literature around both can be compared to reveal convergence between the conventions of epistemic games and applied drama, closing a conceptual gap between the two fields. This is further explored through application of the conventions to produce a prototype Web-based scenario system.

Serious and epistemic games

The use of digital games for learning and other overtly non-entertainment purposes is regularly placed under the paradoxical term 'serious games'. Squire notes that although

Proceedings of DiGRA 2011 Conference: Think Design Play.

© 2011 Authors & Digital Games Research Association DiGRA. Personal and educational classroom use of this paper is allowed, commercial use requires specific permission from the author.

this is often used by entertainment game developers to describe a potential new market for their products and expertise (2007, 51), it does not necessarily represent the entire field of games and learning. Prensky uses the term ‘digital game-based learning’ as the title of his well-known book (2001), though many of the products he describes are specifically aligned to corporate training and business simulation. Shaffer has used the term ‘epistemic games’ to describe digital models of professional practice used to engage students with problem-solving skills (Shaffer 2004), and this study explores this form in greater depth. Shaffer (2005), Gee (2005) and others discuss epistemic games within the discourse of digital games, and although the principles they describe are not necessarily limited to these forms, they see computer technology as opening up much wider possibilities for authentic learning experiences through a capacity to model real-world processes (Shaffer 2006). Beyond these representational aspects, they see the potential to create learning environments that situate students within a virtual professional community of practice. This places serious and epistemic games into territory that educational designers might normally label as simulation (Gredler 1996), though the technical distinctions are increasingly problematic with the evolution of digital technology. In particular, the creation of 3D virtual worlds and other mediated spaces in which people come together to share practice has rapidly blurred the distinctions between computer-based simulations and games.

Applied drama

The authentic learning experiences identified by Shaffer in epistemic games are similar to practices undertaken in the field of ‘applied drama’. This too is a contested term among practitioners and researchers. Nicholson argues that the terms ‘applied drama’ and ‘applied theatre’ should not be viewed in opposition to the concept of ‘pure’ drama as an art form or the theatre as a specialized performance space, but rather as a set of cultural and theatrical practices ‘...that are motivated by the desire to make a difference to the lives of others’ (Nicholson 2005, 16). In this paper, applied drama is used to describe the use of dramatic conventions for non-entertainment, and therefore mostly non-theatrical, purposes — and, most directly, those grounded in the educational field. We have also used the term because of an early tendency in the emerging games studies discipline to confuse the principles and aesthetics of drama and theatre. The central problem appears to be that of the role of an audience. Theatre has an audience, but applied drama like digital gaming does not necessarily need one. Seminal works on digital interactivity considered the ‘computer as theatre’ (Laurel 1991), such that ‘computers are providing us with a new stage for the creation of participatory theatre’ (Murray 1997, 12). However, a difficulty in creating a conceptual link to the theatre was that the digital technology couldn’t replicate the theatrical experience for participants or spectators. Many games researchers instead turned to more familiar screen-based narrative forms such as cinema, and so ‘the videogame industry became closer to Hollywood and not to Broadway’ (Frasca 2001, 17). This paper describes a way to bridge the remaining conceptual gap between the conventions of digital games and those of non-theatrical drama forms, particularly when both fields are applied to non-entertainment settings.

Drama and games: Forms and conventions

In educational contexts, applied drama is expressed through a variety of methods, principles and sets of conventions which themselves are collected under an assortment of terms. This includes the role-based improvisational forms known as process drama, Mantle of the Expert, and the Commission Model. Many of these drama conventions would strike a chord with games researchers, particularly those working in educational settings. Firstly, process drama is a form of non-theatrical role-based drama with a history

that goes back to the middle of the twentieth century and emerges from the educational drama work of Heathcote (1991), Haseman (1991), O'Neill (1995), Bolton (1999), Howell and Heap (2001) and many others. As the name implies, it sees the process of performance as being the learning objective rather than the actual product. It is a form of improvised drama, situated in a specific context, which develops a performed dramatic narrative without a script or an external audience. It unfolds at life-rate and operates from a discovery-at-this-moment basis rather than being memory-based (Howell and Heap 2001, 7), such that participants interact in role but do not have to act in character. The narrative, tensions and drama unfold in time and space through action, reaction and interaction without the use of a pre-written textual script. A characteristic of this and related forms is that the teacher moves in and out of role as required, 'bestriding the two worlds of fiction and reality' (Heathcote and Bolton 1995, 30).

Mantle of the Expert (Heathcote and Bolton 1995, 15) extends process drama into a dramatic form in which the participants assume a role of professional expertise to run an imagined enterprise for a client. Heathcote argues that this process operates in both the real and imagined worlds of the learner, and feels the term expresses the dual layers in which:

'expert means opportunity to work at knowledge and master the skills. Mantle means I declare my calling and live up to what is expected of me in the community' (Heathcote 2002, 3).

Ideally, the application of Mantle of the Expert as a drama strategy will allow students to become characters endowed with specialist knowledge that is relevant to the situation; that situation will usually be task-oriented; the power and responsibility moves from teacher to student; and the learners feel respected by having expert status (Neelands and Goode 2000, 34).

A further development of this technique is now occurring in applied drama where the dramatic conventions of Mantle of the Expert are combined with online communities of practice (Wenger 1998) and situated learning (Lave and Wenger 1991) to provide participants with access to professional areas of expertise. It is an approach which emphasizes 'involvement, participation and engagement' (Nicholson 2005) in the dramatic context. A more recent extension of Mantle of the Expert's principles to include real clients can be seen in Heathcote's description of what she calls the Commission Model:

'It will work like this. The work of the staff and students will be that of responders to commissions sent to them from the community. The commissions will make precise demands and will have a built-in time structure so that on the commission being accepted an allowance of time and resources will be decided. The work and results of the commissions will always be brought to a publication which can vary according to the nature of the commission' (Heathcote 2002, 9).

These applied drama forms, and digital game forms such as epistemic games, share common ground with attempts to provide learning that is situated in real-world practice, with authentic activities (Brown, Collins, and Duguid 1989) and problems for the learners to engage with. The focus on professional problem-solving links these forms with educational strategies such as cognitive apprenticeship (Collins, Brown, and Newman 1989), which attempts to make visible to the novice the invisible cognitive processes of

the expert. There has been some exploration of using technology with that model in ways that make use of games or simulations (Parkes and Muldoon 2010).

Educational drama practitioners are familiar with the adoption, adaptation and application of conventions. This broadly describes indicative models or examples based on common practice. Conventions are generally not presented as prescriptive standards, and as Heathcote and Bolton suggest drama practitioners often draw upon a series of guidelines 'rather than "steps" because they are not meant to suggest a particular order of doing things' (1995, 28). Howell and Heap use the term 'drama strategies' to include 'focus, metaphor, tension, symbol, contrast, role, time and space' (2001, 85), which they emphasise are shared by all forms of theatre. Neelands and Goode suggest that 'conventions are indicators of the way in which time, space and presence can interact and be imaginatively shaped to create different kinds of meaning in theatre' (2000, 4).

One of the drama conventions that helps shape the imaginative interactions considered in this paper is that of pre-text (O'Neill 1995), which serves to activate the meanings that are inherent in the dramatic content and helps to establish the location, roles and situation of the drama. The imaginative power of the dramatic pre-text is that it can provide infinite imagined roles and places for exploration, even within the physical context of a classroom (Howell and Heap 2001, 28). Pre-text builds a 'past, present and future' (Heathcote and Bolton 1995, 30) which helps to frame the participants in a clear relationship with the potential action of the drama, and defines the nature and extent of the dramatic world. In digital games, a range of conventions operate to perform a similar function, even including the promotional and packaging materials, with 'a story on the package, in the manual, or somewhere else, placing the game in a larger story' (Juul 1999, 40). Pre-text can be enhanced through the use of digital media forms, and especially by connecting learners with real communities of practice, and this is a challenge for applied drama created by the rapid emergence of networked digital technologies. Conversely, the field of digital game studies could benefit from an understanding of the concept of pre-text as a process in which players are rapidly immersed into the dramatic frame of the game.

The use of a performance frame is another dramatic convention in which the participant is operating as if the situation is real. This creates a 'doubled reality' in which the 'as if' frame of the drama or game takes place in the 'as is' frame of reality, making it possible to hold multiple 'IS+IF' frames simultaneously and move between them (Edmiston 2003, 223). Gee also notes that we all exist in a 'lifeworld domain' in which we act as 'everyday' people and not as 'specialists' in a domain of knowledge, including video games (Gee 2003, 36). The concept of adopting a dramatic role and a separate identity has also been widely incorporated into everyday culture, from Goffman's use of frame analysis (1974) to Goleman's notion of emotional intelligence (1995). It has been adopted for education and training, as well as computer studies (Turkle 1995). It is also a central concept in the analysis of digital environments such as virtual reality spaces, online chat rooms and video games (Ryan 2001). Similarly, framing becomes a crucial convention in epistemic games, which distil the 'as if' quality to give students an appropriate and authentic worldview with which to view, explore, define and solve problems, for:

'an epistemic game is a game that deliberately creates the epistemic frame of a socially valued community by re-creating the process by which individuals develop the skills, knowledge, identities, values, and epistemology of that community' (Shaffer 2006, 164).

The performance frame for both drama and video games allows for a structure that protects the participants in their dramatic involvement with and within the emerging narrative. The concept of penalty-free behaviour reflects what psychologist Eric Erikson (1968) has called a psychosocial moratorium, and which James Gee (2003, 62) sums up as ‘a learning space in which the learner can take risks where real-world consequences are lowered’. The role conventions operating in the performance frame of both applied drama and serious games has been described using the terms role protection and role distance (Carroll and Cameron 2005), which outline the degree to which this penalty-free role position is created and maintained in relation to an emotional distance from the heart of the drama or game.

At one end of the convention continuum there is the adoption of full role with minimal protection, at the other end there is complete protection by dropping the role completely and stepping away from the game or drama. This in-role/out-of-role episodic nature of applied drama and digital game play is another convention operating within the performance frame, and is a key connection between live role-based performance in applied drama and mediated performance in digital games.

Game designers often use the term ‘game mechanics’ to describe conventions or elements common to many digital games, though the term describes the interactions made possible, not just mechanical actions (Crawford 1982). These conventions are essential, as:

‘a game’s core mechanic contains the experiential building blocks of player interactivity ... The core mechanic is the essential nugget of game activity, the mechanism through which players make meaningful choices and arrive at a meaningful play experience’ (Salen and Zimmerman 2004, 317).

Game mechanics transfer the formal system of computer codes and rules into an experiential system for the player. As games are a complex and subjective experience there is no universally accepted taxonomy of these game conventions; they are ‘the core of what a game truly is. They are the interactions and relationships that remain when all of the aesthetics, technology, and story are stripped away’ (Schell 2008, 130). He lists six game mechanics as:

1. *Space*, the mathematically constructed abstract place(s) than can exist in a digital game;
2. *Objects*, the ‘nouns’ within the space such as props, tokens, characters. Objects will have attributes, which are categories of information about the objects, and states, which are the current values of those attributes. For example, a game might include a car object, with a speed attribute, and a current state of 100kph.
3. *Actions* are the ‘verbs’ that define what players can do in the game;
4. *Rules* define the above mechanics and establish goals for the player; and
5. *Skill* is a mechanic focused on the player rather than the game, and which provides the challenge that makes the game interesting. One goal is to create ‘optimal experience’, or ‘flow’ (Csikszentmihalyi 1990). Flow in the design of digital games is the convention of matching increasing skill levels with

progressive challenges, ideally so that the player doesn't feel too anxious about failure, or too bored with success.

6. *Chance* is Schell's final game mechanic, which draws on both mathematical models of probability and the unpredictability of human interaction, to introduce a challenging uncertainty into the operation of these mechanics (Schell 2008, 130 - 169).

Increasingly many digital media forms based on online and mobile technology exhibit game-like behaviours or integrate play into a range of otherwise non-entertainment activities. Sutton (in Shaughnessy 2005, 208) notes that the appropriation of the 'conventions, techniques and technologies' of media to create drama, and vice versa, is now part of working with a hybrid literacy form familiar to young people. When discussing digital game conventions in this paper, the conventions of digital media more generally also apply. Feldman (1997) argues that all digital information is manipulable, in that the data can be changed and adapted from the moment it is created or captured. Manovich relates this to the programmable and infinitely variable nature of the digital content produced in these new media forms, and also notes that this manipulation can be automated to occur without human action (2001, 27-31). Boyd notes that a combination of mediatization and online networking creates additional properties of persistence and searchability, as digital content can be archived for posterity and discovered through search tools (Boyd 2008, 126).

Digital content is also networkable, as it can be shared and exchanged by large numbers of users simultaneously (Feldman 1997). This creates 'invisible audiences', as it can be impossible to know who will access distributed content (Boyd 2008, 126). Its modular nature also allows it to be aggregated or assembled into larger objects (Manovich 2001). Digital data is dense, as large amounts of information can be stored in a small physical space such as a DVD or hard drive, and compressible, in that information can be made to fit into narrow distribution channels and then decompressed (Feldman 1997). Digital media content is also impartial, as computer systems don't care what the ones and zeroes actually represent and thus content can be multimedia (Feldman 1997, 3-8). Manovich argues that this content is also transcoded from human cultural forms, to forms that are more readily organised and understood by computers (Manovich 2001). Boyd notes that networked content is replicable, to the point where it is impossible to distinguish original from copy (Boyd 2008, 126).

All of these digital media conventions have implications for the creation of hybrid forms of applied drama and digital games in order to take into account the everyday technologies embedded in the lives of today's learners.

Affinity spaces

Discussion about the crossover of applied drama and digital games is about the application of conventions and the development of creative learning spaces infused with or generated through technology. Gee (2004) uses the term 'affinity space' to describe the real and virtual places where people come together to share common interests and endeavours. This relates to the concept of virtual or distributed communities of practice (Wenger 1998) though Gee sees a need to make the distinction between a focus on the space and the activities within it, rather than a concentration on the existence of the group itself:

‘an affinity space is a place (physical, virtual, or a mixture of the two) wherein people interact with each other, often at a distance (that is, not necessarily face-to-face, though face to face interactions can also be involved), primarily through shared practices or a common endeavour (which entails shared practices), and only secondarily through shared culture, gender, ethnicity, or face-to-face relationships’ (Gee 2004, 98).

Flew (2002, 98) suggests that the development of home-based games consoles like PlayStation, Wii and Xbox ‘has drawn attention to the importance of developing media forms based around engagement and distraction, that draw the user away from ‘reality’ into a new thoroughly ‘mediatised’ space’. These ‘media-liminal spaces’ become places where ‘differences can be played out that could not be played out in normal social routines’ (Balnaves, Hemelryk Donald, and Shoesmith 2009, 271), allowing young people to explore roles and identities in ways not possible in real life. Researchers for the MacArthur Foundation’s Digital Youth project have also highlighted that life is now experienced within a number of physical and virtual spaces: homes and neighbourhoods, institutionalized spaces, online sites, and interest groups (Ito et al. 2008).

The emergence of new — sometimes non-physical, non-institutionalized and digitally mediated — spaces in which learning could occur is central to this paper. One obvious impact of digital technology on education is the ability to extend the learning beyond the boundaries of the physical space in which it may originally, or ultimately, be enacted. As computers are capable of representing real or fictional worlds through video games and virtual reality software, they give learners:

‘access to new worlds: to parts of the real world that are too expensive, complicated, or dangerous for them except through computer simulations, and to worlds of imagination where they can play with social and physical reality in new ways’ (Shaffer 2006, 11).

The distinction between real and imagined is an important consideration. Edmiston observes that while process drama creates a shared fictional space ‘the imagined world does not replace the everyday classroom world, but rather begins to be created alongside the everyday world’ (2003, 222) and participants move between them as needed. Ahdell and Andresen (2001, 68) also identify the ‘drama effect’ of educational software, by which users are still engaged in the learning experience, regardless of how ‘real’ the elements are, because they are aware of the distinction between computer-generated and real spaces. This representational power of computers is apparent on many levels in these affinity spaces.

However, it is important to note that these affinity spaces are not limited to graphically rich virtual worlds. Some of the digital media forms considered as spaces for drama in this study include email and other text-based publication and communication channels for example. Although concentrating his analysis on 3D game spaces, Nitsche notes that a game is experienced in a ‘fictional space that lives in the imagination’ of the player as well as in mediated and physical spaces (Nitsche 2008, 16). The adoption and adaptation of the participants’ everyday technologies such as online social network sites and mobile phones, especially when combined with drama and game conventions, also provides opportunities for explorations beyond the physical and temporal constraints of the classroom. Many affinity spaces are exhibiting features of what are now being called ‘blended learning’ approaches (Garrison and Vaughan 2007) where the most appropriate

affordances of physical and virtual presence and participation are combined. How the conventions of applied drama and digital games merge with real communities of practice to create affinity spaces is a new area of understanding to be explored.

COMPARING THE CONVENTIONS OF MANTLE OF THE EXPERT AND EPISTEMIC GAMES

The fundamental conventions that define the applied drama form of Mantle of the Expert, and the serious game form described as epistemic games are compared in Table 1. While educators who use drama or digital game-based learning may use differing terms, it is proposed that they share similar conceptual understandings regarding the use of role-play and identity. Both pedagogies include the use of an initial pre-text and similar approaches to problem solving, including the dramatic representation of reality, the protections offered to participants by role conventions, the relationship between participant/player and a relevant audience as well as the performance outcomes and connections to real-world expertise.

There are significant similarities between Mantle of the Expert's reliance upon a dramatic frame, which enables participants to act 'as if' they are experts, and an epistemic game's professional 'game' world frame that students enter. This does not mean that a high level of fidelity or a virtual reality system is required in either case. Rather, it is the authenticity of the problem, and the professional approaches to solving it, that will engage learners to act 'as if' they are members of a professional community within the framed environment.

Both pedagogical forms are built upon the concept of giving students an entry into an appropriate and authentic professional perspective with which to view, explore, define and solve problems. Students in both forms enter into a framed activity (Stage 1) that is explicitly provided by the facilitator/teacher. Within Mantle of the Expert this frame is provided by the dramatic pre-text while in epistemic games it is presented as a digitally constructed professional task (Stage 2). By assuming this attitudinal role as an expert or assuming the authentic language conventions of a professional (Stage 3), the students begin to undertake the framed, problem-solving activity (Stage 4). The focus in both cases is on providing the client with a suitable solution that provides both task focus and tension for both forms (Stage 5). The solution to the task is presented to the audience, in the case of Mantle of the Expert primarily for the dramatic role-based client, while in epistemic games the audience consists of the facilitator and peers (Stage 6). In both forms, a wider audience (e.g. parents) might also be present, particularly in larger school-based or community-oriented projects.

Stage	Element	Mantle of the expert	Epistemic games
1	Frame	Drama: Entering the world of the drama using drama conventions.	Game: Entering the simulation environment through epistemic frame.
2	Entry	Enterprise as pre-text: Drama based, but authentic.	Professional task: Game-based, but authentic.
3	Stance	Attitudinal role: Professional discourse (often at trainee level) in role, but not character.	Authentic language: Professional discourse in approach to problem.

4	Focus	Client: Enterprise needs to serve the client.	Project: Working on project or task appropriate to profession.
5	Enactment	Dramatic tension: Increases level of commitment and intensifies task focus and creative outcome.	Discipline discourse: Tension in ‘conversation’ between problem-solving individuals and the community of practice leads to creative solutions.
6	Exposition	In-role as expert to client: Learning is displayed in presentation to client, with students protected by role as experts.	Game solution to peers: Learning is displayed in presentation of solution to peers using game system.

TABLE 1: Comparison of conventions operating in Mantle of the Expert and Epistemic Games.

The dramatic use of role and performance within Mantle of the Expert inform and define the nature of the participant’s functioning within the drama while optimizing results from these learning moments. The technique allows for participants to quickly engage in the professional role being represented by adopting an attitudinal role (Carroll and Cameron 2005, p. 6) that does not initially require deep knowledge, experience or high-level acting ability. By accepting the attitude and entering into the discourse of the professional field defined in the pre-text, students engage in the tasks at hand, often inducted into their roles as trainees by the facilitator.

In epistemic games, the participants also take on the problem-solving task in a similar way to real professionals, by starting to acquire the language of the professional community to define and tackle problems that would normally be encountered in that profession. In both forms of framing, the epistemic game and the dramatic scenario, the tasks engage the students in role identification, requiring them to think as if they were professionals by prompting them to adopt the skills, knowledge, identity, values and responsibilities of that profession.

CASE STUDY: CONVERGING CONVENTIONS FOR CRISIS SIMULATION

Drawing on the principles and practice of both applied drama and epistemic games, a prototype online role-based scenario system was one outcome of a joint project between Charles Sturt University and the Australian Defence Force (ADF). From 2007 – 2010 an Australian Research Council linkage project examined the potential use of simulation tools by ADF public affairs personnel to explore, analyse and enhance crisis communication management. Crises occur in a variety of forms such as natural and human-made disasters, government and political conflicts, and corporate or individual reputation incidents (Arciuli, Carroll, and Cameron 2008). Crisis communication occurs in a variety of forms but tends to share general characteristics such as being unpredictable and dynamic (Coombs 2007; Heath and Millar 2004).

Working closely with the Australian Defence Simulations Office (ADSO) and the ADF to better understand their organisational communication processes under extreme pressure, the project aimed to merge established educational drama techniques and

conventions with principles drawn from the technologies of digital games, blended learning environments and social media. A prototype distributed role-based simulation application called CADGE (Communications and Applied Drama Game Engine) was developed for piloting with the ADF public affairs personnel (Bossomaier et al. 2010). Another element of the project was the definition of a scenario development language, dubbed CRASL (Communication Representation and Specification Language). The aim of CRASL is to provide a non-technical scenario creation language, modelling a typical lesson plan that a teacher might create for an applied drama session, and therefore accessible to domain experts with absolutely no computer programming experience. The current CRASL compiler generates an XML file to be read by the game engine (Bossomaier et al. 2010).

In May 2011, CADGE was used to deliver a pilot scenario to a class of undergraduate media students studying the role of social media in crisis communication at an Australian university. The scenario had been previously trialled in a less interactive ‘choose your own adventure’ form that provided students with a relatively static set of prepared resources (Cameron 2001; Carroll, Anderson, and Cameron 2006). The students logged into the scenario through a browser-based Flash client, and were allocated one of two roles: a journalist working for a local media outlet, or a public relations officer working for a local government organization. This illustrates the creation of an initial Frame (represented as Stage 1 in Table 1) that is apparent in both applied drama and epistemic games. As senior students studying specialist media and communication courses, these students brought with them some prior understanding of the work that people in these positions do. They were framed in the position of novice or apprentice that is typically assigned to new participants in an educational drama or game.

Following allocation of a role, the CADGE then presented a written pre-text for the scenario, which established that the fictional town of Lagoon was facing a flood emergency, and gave the participants some initial actions to perform in their assigned roles. This provided a background deadline pressure for the students, who had to produce either a news story or a media release at the end of the class period. This is typical of the Entry moment (Stage 2) of an applied drama or epistemic game, in which the participant is further drawn into the world of the scenario and given an authentic task to complete.

In their roles as journalists or public relations officers, participants were able to use CADGE’s text-based chat system to seek further information from each other (in role), or attempt to clarify the rumours about the flood damage. CADGE provided the students with a range of media files to explore including images of the flooded town, video clips of emergency workers, maps of the town and region, and text-based conversations with local townsfolk. Figure 1 shows an example of a video clip being viewed in the browser, with the chat window at the top of the screen.

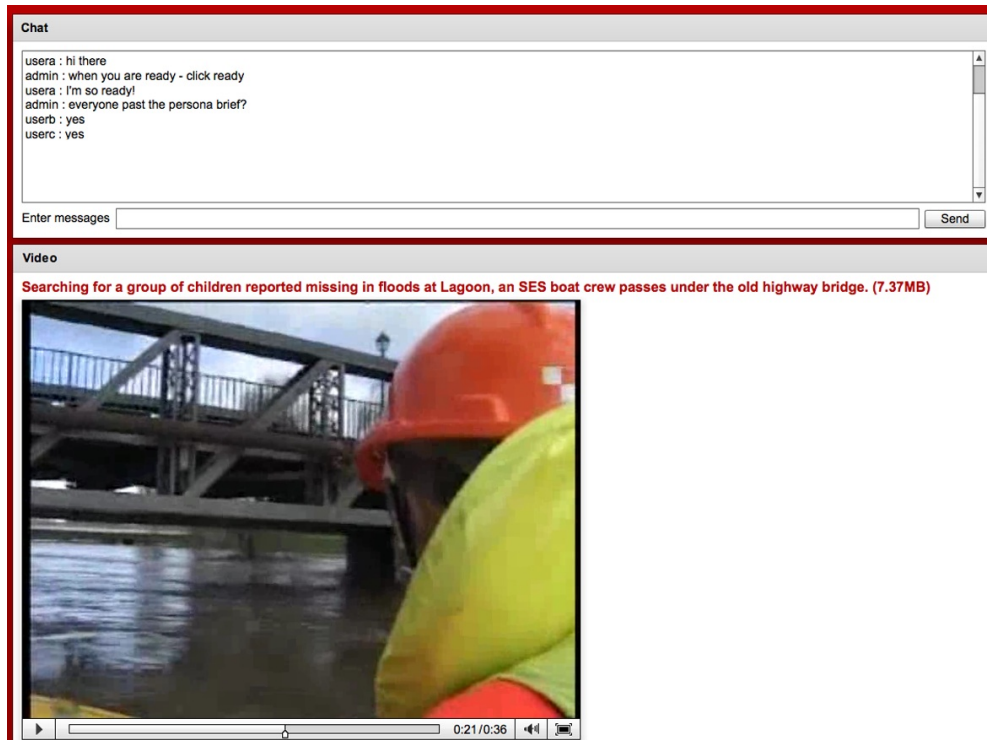


Figure 1: Video player and text chat window in a pilot scenario

Consistent with adopting a professional Stance (Stage 3 as discussed in Table 1), the students worked in an attitudinal role of journalist or media officer, and engaged in the professional discourse of those roles, for example while conducting interviews or preparing information for media release. The focus of the work, enhanced by the deadline pressure established at the start, was to produce the news bulletin or media release to satisfy the 'enterprise' commissioning their expertise – in this case the fictional media outlet or the local government organization.

As considered in Stage 5, Enactment, the scenario content becomes more engaging and 'dramatic' as problems are encountered and participants must start to apply the real-world skills of their respective communities of practice to overcome them. At key times in the session, the facilitator was able to trigger new content to appear on the screens of the journalists and public relations officers as a pop-up window. The students, in role, had to respond to the developing crisis. These messages might be sent globally to all participants, or to a group of students based on their role. Examples of such triggers were a string of Twitter posts (tweets) that contained rumours that a local dam was failing.

Journalists and public relations officers started to get conflicting information from different sources. Another trigger was a video clip posted to YouTube that allegedly supported the dam failure claim. Further reports were of missing children near the swollen river. In this way the developing scenario reflected the conflicting communication patterns that occur in a real crisis. Ultimately, decisions under pressure on what information was communicated to the community had to be made by all participants. Consistent with the Exposition phase (Stage 6 in Table 1), the students concluded the scenario process by sharing the materials they had produced by the deadline. The uploaded reports demonstrated a wide range of communication responses

to a rapidly escalating crisis.

Following the classroom trials of the flood scenario, students were asked to reflect on the experience via focus groups and a journal exercise. This feedback data is now being formally evaluated, but initial summaries show a generally positive response, even from students who highlighted what they saw as technical problems or flaws in the scenario structure:

“It was a bit casual at first I thought, I didn’t know what was going on. Then once you saw the stuff pop up you realised it was becoming real” (Student A, focus group comment).

“Technical difficulties seemed to hold up what was actually happening. However, reflecting on the positives of when it was working ... It has the ability to replicate what it's like in 'real life' with so much information coming at you from a multitude of different sources” (Student B, reflective journal).

From the students’ comments it is clear that CADGE does have the potential to provide an affinity space for learning, using applied drama and epistemic conventions. The CRASL scenario language enables the design of suitably authentic problems that will engage learners to act ‘as if’ they are members of a professional community within the framed environment.

“The exercise was intense, stressful but beneficial in that it encouraged a more interactive approach to accessing information. It helped in getting the information more quickly and efficiently, which is always welcome in the face of deadlines and the competitive pressures of the job” (Student C, reflective journal).

“I found the flood simulation very interesting and feel that we should have done more of those types of activities ... The simulation helped us to work under pressure” (Student D, reflective journal).

CONCLUSION

The two practice-based pedagogies as discussed in this paper centre around David Williamson Shaffer’s work in epistemic games and Dorothy Heathcote’s work in applied drama, particularly the form known as Mantle of the Expert. While there are similarities and differences, there are nevertheless convergences of approach that have some interesting implications for the designers of serious games. They may find it fruitful to access the broad library of frameworks and techniques that have already been developed by applied drama practitioners, including the use of pre-text, role distance and role protection to quickly generate affinity spaces for learning both within and beyond the traditional classroom.

In summary, both pedagogies use the following strategies to develop skills, knowledge and values:

- an apprenticeship model for professions by using role-based framing;
- simulation of reality in order to stimulate imagination and learning;
- use of a problem-solving approach;

- placing value in creative thinking;
- use of interactivity and group based collaboration to complete tasks; and
- use of cognitive, skill-based, practical and affective learning approaches.

The prototype scenario system described in this study supports the application of drama and games to learning, and demonstrates a convergence of approach by practitioners in both fields. It appears that complex skills are learnt from pedagogies that include conventions and ‘mechanics’ such as those that are embedded within Mantle of the Expert and epistemic games. The convergences between epistemic games and the conventions, practice and research developed in applied drama expand the resources available to games designers. This enables the continuing development of games that are authentic and engaging learning experiences.

ACKNOWLEDGEMENTS

The project described in this paper was funded by the Australian Research Council under the Linkage Grant scheme (project LP0775418), with the Australian Defence Force as industry partner. The flood scenario was based in part on resources developed during a teaching fellowship with Charles Sturt University’s Flexible Learning Institute.

BIBLIOGRAPHY

- Ahdell, Rolf, and Guttorm Andresen. 2001. Games and simulations in workplace elearning, Department of Industrial Economics and Technology Management, Norwegian University of Science and Technology.
- Arciuli, Joanne, John Carroll, and David Cameron. 2008. The use of applied drama in crisis management: An empirical psychological study. *Australian Journal of Emergency Management* 23 (3):3 - 8.
- Balnaves, Mark, Stephanie Hemelryk Donald, and Brian Shoesmith. 2009. *Media theories and appraoches: A global perspective*. London: Palgrave Macmillan.
- Bolton, Gavin. 1999. *Acting in the classroom: A critical analysis*. London: Heinemann.
- Bossomaier, Terry, Jim Tulip, John Carroll, and David Cameron. 2010. SCCRASL and CADGE: Crisis representation and simulation in serious games. In *The International Workshop on Applied Modelling & Simulation*. Rio de Janeiro, Brazil.
- Bowell, Pam, and Brian Heap. 2001. *Planning process drama*. London: David Fulton.
- Boyd, Danah. 2008. Why youth (love) social network sites. In *Youth, identity, and digital media*, edited by D. Buckingham. Cambridge, MA: MIT Press.
- Brown, J.S., A. Collins, and P. Duguid. 1989. Situated cognition and the culture of learning. *Educational Researcher* (Jan - Feb):32-42.
- Cameron, David. 2001. Playing serious games in journalism classes. *Asia Pacific Media Educator* 11:141 - 149.
- Carroll, John, Michael Anderson, and David Cameron. 2006. *Real players? drama, technology and education*. Stoke-On-Trent: Trentham.
- Carroll, John, and David Cameron. 2005. Playing the game: Role distance and digital performance. *Applied Theatre Researcher* 6.
- Collins, A., J.S. Brown, and S.E. Newman. 1989. Cognitive apprenticeships: Teaching the crafts of reading, writing, and mathematics. In *Knowing, learning and instruction: Essays in honor of Robert Glaser*, edited by L. B. Resnick. Hillsdale, NJ: Lawrence Erlbaum Associates.

- Coombs, W. 2007. *Ongoing crisis communication*. Thousand Oaks, CA: Sage.
- Crawford, Chris. *The art of computer game design*. Washington State University 1982 [cited March 2010]. Available from <http://www.vancouver.wsu.edu/fac/peabody/game-book/Coverpage.html>.
- Csikszentmihalyi, Mihalyi. 1990. *Flow: The psychology of optimal experience*. New York: Harper.
- Edmiston, Brian. 2003. What's my position? Role, frame, and positioning when using process drama. *Research in Drama Education: The Journal of Applied Theatre and Performance* 8 (2):221-229.
- Erikson, Eric. 1968. *Identity, youth, crisis*. New York: Norton.
- Feldman, Tony. 1997. *Introduction to digital media*. London: Routledge.
- Flew, Terry. 2002. *New media: An Introduction*. Melbourne: Oxford University Press.
- Frasca, Gonzalo. 2001. Videogames of the oppressed: Videogames as a means for critical thinking and debate, School of Literature, Communication and Culture, Georgia Institute of Technology, Georgia.
- Garrison, D.R., and N.D. Vaughan. 2007. *Blended learning in higher education: Framework, principles and guidelines*. San Francisco: Jossey-Bass.
- Gee, James Paul. 2003. *What video games have to teach us about learning and literacy*. New York: Palgrave.
- . 2004. *Situated language and learning: A critique of traditional schooling*. Edited by D. Barton, *Literacies*. New York: Routledge.
- . 2005. What would a state of the art instructional video game look like? *Innovate* 1 (6).
- Goffman, Erving. 1974. *Frame analysis: An essay on the organization of experience*. New York: Harper and Row.
- Goleman, Daniel. 1995. *Emotional intelligence*. London: Bloomsbury Publishing.
- Gredler, Margaret E. 1996. Educational games and simulations: A technology in search of a (research) paradigm. In *Handbook of research for educational communications and technology*, edited by D. H. Jonassen. New York: MacMillan.
- Haseman, Brad. 1991. Improvisation, process drama and dramatic art. *The Journal of National Drama* (July):19-21.
- Heath, R, and D Millar, eds. 2004. *Responding to crisis: A rhetorical approach to crisis communication*. NJ: Lawrence Erlbaum Associates.
- Heathcote, Dorothy. 1991. *Collected writings on education and drama*. Evanston: Northwestern University Press.
- . 2002. Contexts for active learning: Four models to forge links between schooling and society. In *NATD*.
- Heathcote, Dorothy, and Gavin Bolton. 1995. *Drama for learning: Dorothy Heathcote's Mantle of the Expert approach to education*. Portsmouth: Heinemann.
- Ito, Mizuko, Heather Horst, Matteo Bittanti, Danah Boyd, Becky Herr-Stephenson, Patricia G. Lange, C.J. Pascoe, and Laura Robinson. 2008. Living and learning with new media: Summary of findings from the Digital Youth Project. The John D. and Catherine T. MacArthur Foundation.
- Juul, Jesper. *A clash between game and narrative*. University of Copenhagen 1999 [cited March 2010]. Available from <http://www.jesperjuul.net/thesis/>.
- Laurel, Brenda. 1991. *Computers as theatre*. Menlo Park: Addison Wesley.
- Lave, Jean, and Etienne Wenger. 1991. *Situated learning: Legitimate peripheral participation*. Cambridge, UK: Cambridge University Press.
- Manovich, Lev. 2001. *The language of new media*. Cambridge, MA: MIT Press.

- Murray, Janet. 1997. *Hamlet on the holodeck: The future of narrative in cyberspace*. New York: The Free Press.
- Neelands, Jonathan, and Tony Goode. 2000. *Structuring drama work: A handbook of available forms in theatre and drama*. 2nd ed. Cambridge, UK: Cambridge University Press.
- Nicholson, H. 2005. *Applied drama: The gift of theatre*. Basingstoke: Palgrave Macmillan.
- Nitsche, Michael. 2008. *Video game spaces: Image, play and structure in 3d worlds*. Cambridge, MA: MIT Press.
- O'Neill, Cecily. 1995. *Drama worlds: A framework for process drama*. Portsmouth: Heinemann.
- Parkes, Robert J., and Nona Muldoon. 2010. The tutorial as cognitive apprenticeship: Developing discipline-based thinking. In *An academic life*, edited by R. H. Cantwell and J. J. Scevak. Camberwell: Acer Press.
- Prensky, Marc. 2001. *Digital game-based learning*. New York: McGraw-Hill.
- Ryan, Marie-Laure. 2001. *Narrative as virtual reality*. Baltimore: John Hopkins University Press.
- Salen, Katie, and Eric Zimmerman. 2004. *Rules of play: Game design fundamentals*. Cambridge, MA: MIT Press.
- Schell, Jesse. 2008. *The art of game design: A book of lenses*. Burlington, MA: Morgan Kaufmann.
- Shaffer, David Williamson. 2004. Epistemic frames for epistemic games. *Computers & Education* 46:223-234.
- . 2005. Epistemic games. *Innovate* 1 (6).
- . 2006. *How computer games help children learn*. New York: Palgrave Macmillan.
- Shaughnessy, Nicola. 2005. Truths and lies: Exploring the ethics of performance applications. *Research in Drama Education: The Journal of Applied Theatre and Performance* 10 (2):201-212.
- Squire, Kurt D. 2007. Games, learning and society: Building a field. *Educational Technology* 4 (5):51-54.
- Turkle, Sherry. 1995. *Life on the screen: Identity in the age of the Internet*. New York: Simon & Schuster.
- Wenger, Etienne. 1998. *Communities of practice: Learning meaning and identity*. Cambridge, UK: Cambridge University Press.