

Games As Practice: Simulating How Professionals Think, Work And Learn

David Cameron

Charles Sturt University

dcameron@csu.edu.au

Abstract. This paper explores the concept of 'epistemic games' - computer games that help participants learn how to solve real-world problems by thinking like professionals. How does a doctor learn to think, act, and solve problems like a doctor? How do engineers, lawyers, journalists, scientists, and soldiers learn to view the world through the particular 'frame' of their profession? As a case study this paper outlines an epistemic games/frames approach to the training of Australian Defence Force public affairs personnel. This joint project between Charles Sturt University, the Australian Defence Simulation Office and Defence Public Affairs seeks to develop a simulation tool to explore crisis communication management. The speed and reach of modern media have increased the potential battlefield effects of public affairs and crisis communication. Using a combination of applied theatre, role-play and computer gaming techniques to develop simulation tools and scenarios, the project aims to identify and simulate the ways in which personnel learn to effectively manage public affairs operations within the ADF context.

1. A GAME BY ANY OTHER NAME ...

A potentially confusing array of terms has emerged in an attempt to describe, often to sceptical audiences, the intersections between learning, training, games, role-play and drama. Videogames and theatre as popular entertainment industries have created strong pre-conceptions about the limited validity of these forms as educational tools – particularly when it comes to developing professional practice in traditionally conservative areas such as education, health, and government.

This paper examines the intersection of the serious games movement emerging from the videogame and simulation industries, and the applied drama field that is based on non-theatrical uses of dramatic conventions. In particular, it examines two sub-forms - epistemic games and Mantle of the Expert – and considers why a focus on how professionals learn a particular problem-solving view of the world might enhance the learning potential of both the serious games and applied drama fields.

1.1 Serious Games

The term serious game has gained currency this decade in an attempt to describe the application of videogame technologies and principles to contexts beyond entertainment. It currently encompasses a broad range of activities along the full continuum of game-like products, from high-end simulations through to the educational use of Commercial-Off-The-Shelf (COTS) game titles. The term is itself ironic and not readily defined, but it has become a popular banner to promote the notion that videogames have wider significance and potential beyond the commercial entertainment sphere.

Serious games are not only about training or education; the term is also used to describe games with other primary objectives such as social or political change,

exploration of news events, marketing and advertising. Some serious games projects have been developed with non-entertainment purposes in mind from the beginning, others are adaptations of existing entertainment titles.

The following list based on Sawyer and Smith's 2008 "Serious Games Taxonomy" [1] shows some of the terms that have been used in an attempt to describe these non-entertainment - often learning and training - applications of games:

- Serious games
- Immersive learning situations
- Educational games
- Social impact games
- Simulation
- Persuasive games
- Virtual reality
- Games for change
- Alternative purpose games
- Games for good
- Edutainment
- Synthetic learning environments
- Digital game-based learning
- Game-based "x"

This is not to say that fun or entertainment is never a consideration in the serious use of game-like products. Indeed one criticism of educational games is that they are simply "sugar-coated broccoli" designed to sweeten the learning of difficult ideas.

Into this mix we can add another related concept, which draws upon the potential of games to create powerful learning opportunities, and to thus enable learner/players to develop significant problem-solving skills comparable to innovative professionals. Drawing on the work of David Williamson Shaffer and colleagues at the University of Wisconsin-Madison, "epistemic games" [2] provide a useful design approach

to developing digital learning environments based on real professional practice.

1.2 Epistemic Games

An epistemic game can be defined as:

“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 and epistemology of that community”. [3]

At the heart of epistemic games is the concept of the *epistemic frame*. This is the combination of skills, knowledge, identities, values, and epistemology (knowledge and problem-solving approaches) that frame the way we view the world and the problems that we encounter within it. Shaffer argues that a professional in any field will have a particular frame that shapes the way they approach a real-world problem. For example, engineers hold a certain set of skills, knowledge, identities, values and epistemologies that enable them to be innovative problem-solvers when confronted with an engineering problem.

The concept of the epistemic frame draws upon the work of sociologist Erving Goffman [4], which in turn leads to the notion of the dramatic frame in which a participant operates “as if” a situation is real. Epistemic games are also founded theoretically upon Schon’s concept of reflective practice, in which “professionals learn to think in action and learn to do so through their professional experiences. Reflective practice involves both taking action and then reflecting on the results with peers and mentors.” [5]

The epistemic frame of a profession is therefore clearly shaped by the way a novice in that field becomes a professional. There is always a gap that must be bridged, and in many modern professions this takes place as a combination of formal learning, mentoring from professionals, legitimate peripheral participation in a community of practice [6], and through structured practical experience (the professional practicum) or situated learning.

Shaffer argues that an epistemic game can bridge that gap between novice and professional by assisting with rapid adoption of innovative real-world problem-solving skills, even for people who do not necessarily want to become a true professional in that field. It should be noted that Shaffer and his colleagues are working primarily with school-age children, and a goal of their research is to use game technologies to empower these young learners with innovative problem-solving abilities to equip them for success in the modern world.

But for designers of serious games, or for those working with adult audiences, this emphasis on identifying how professionals develop their epistemic frame also represents a significant design approach for broader simulation and gaming projects. For example, a computerized flight simulation might be an accurate

analog of flying a particular aircraft, with the instruments and control surfaces acting according to realistic physical models. But can such a flight simulator reflect all of the processes by which a real pilot learns to be a member of that flying community? It is the way of thinking – the epistemology – of a practice “that determines how someone in the community decides what questions are worth answering, how to go about answering them, and how to decide when an answer is sufficient”.

How then might simulations and serious games better incorporate the concept of professional practicum into their design, in order to more fully replicate the manner in which professionals learn? How might you engage non-professionals with the core or condensed elements of practice required to promulgate innovative problem-solving approaches?

There is in fact a large body of research and practice in the drama and education field, dating back at least to the mid-twentieth century, that provides some useful conventions for examining how and why epistemic games might be an effective approach to developing virtual learning worlds based on digital tools. Educational drama, or drama in education, has some specific forms better known in the literature as process drama and applied drama [7] that offer some techniques and conventions yet to be fully explored and exploited by serious games designers, despite some clear parallels in objectives and functions.

1.3 Applied Drama

Like serious games, the term “applied drama” [8] is somewhat of an umbrella term for drama forms beyond those normally associated with entertainment. Applied drama focuses on how the role of the performer/participants/audience is applied to bring about some change in understanding or circumstance. For some educators and practitioners this has led to the adoption of the form known to them as process drama [9] a type of improvised role-based drama with a history that draws on the educational drama work of Heathcote [10], Haseman [11], O’Neill [12], Bolton [13], and many others.

This has led to the development of a range of dramatic conventions that allow participants to move in and out role without the need for elaborate props or deep knowledge of the roles they are going to inhabit. Process drama describes a dramatic form in which performance to an external audience is largely absent but presentation to the internal audience is essential [14]. This parallels the basic function of serious games to enable learning or change through personal engagement in the action of the game.

Thus for many applied drama educators and practitioners there is no surprise to be found in Shaffer’s observation that:

“Getting players to take on the identity of a professional is relatively easy. In fact, there is a kind of recipe – a

heuristic or rule of thumb – for how to get someone to see themselves as a professional, and for others to see them in that way. To make players feel like a professional X in an epistemic game, it seems they need someone to tell them they are a professional X. They need a badge of office or prop of profession X. They need to do something that they expect a professional X to do. They need to learn about something that a professional X does that they didn't know was part of the profession and then do that thing. They need someone they know (a peer, perhaps, or a parent) to see them as a professional X. And the virtual world of the game in which they are a professional X needs to be consistent in treating them like professionals rather than school students". [15]

What Shaffer calls "a kind of recipe" is actually a set of well-tested dramatic conventions that have been used in educational settings for several decades to produce the types of effects described here in terms of epistemic games. The participant's clear suspension of disbelief is a fundamental condition in drama, echoing the focus on concepts such as "immersion" and "flow" [16] common to many discussions on the power of games as learning environments. Increasingly, applied drama conventions are drawing upon conventions from the digital media environment, making use of familiar and everyday technologies to initiate and enhance the experience for "digital native" audiences. Thus many distinctions between digital game and applied drama conventions are beginning to blur.

2. APPLIED DRAMA AND SERIOUS GAMES

Epistemic games require that players be engaged in solving real and significant problems, using a professional world-view (the epistemic frame), and preferably under the mentorship of a professional in that field. This is almost a direct comparison to specific applications of process drama known as "Mantle of the Expert" which engages participants in producing works or solving problems as if they are seeking to become a professional in that field. Another version is the "Commission Model" work of Dorothy Heathcote [17] which sees participants, even relatively young children, engaged in the production of a commissioned task for a real client, requiring contact with real professionals to solve actual problems.

In Table 2 below Carroll and Cameron [18] have attempted to compare the fundamental elements of mantle of the expert and epistemic games. While the terms used by drama and video game educators may differ, it is clear that they share similar conceptual understandings regarding the use of role-play, problem-solving, simulation and connections to real world expertise as an approach to learning.

Table 2: Comparing elements of drama and games

Mantle of the Expert	Epistemic Games
Dramatic Frame: Entering the world of the drama using drama conventions	Epistemic Frame: Entering the simulation environment
Role: Attitudinal (not a character) professional discourse (often at trainee level)	Task Identity Real profession (professional discourse)
Enterprise: Drama based, but authentic	Task: Game based, but authentic
Client focus: Enterprise needs to serve the client	Project focus: Working on project or task appropriate to profession
Practicum: Join community of practice through role based drama to meet needs of client. Develop expertise	Practicum: Game-based practicum replicates key features of learning in community of practice. Develop expertise.
Problem: Introduces dramatic tension to increase level of commitment and intensify task focus and creative outcome.	Problem: Tension in 'conversation' between problem-solving individuals and the community of practice leads to creative solutions
Engagement: Adopting community of practice knowledge, identity and value system to solve problem	Simulation: adopting epistemology of a community of practice to solve problem

In Table 2 we see that Mantle of the Expert relies upon the conventions of drama to engage participants in the world being explored, a dramatic frame enables participants to act "as if" they are experts engaged in real tasks as members of a community of practice. Similarly, epistemic games require that learners enter the world being simulated by the game environment. This does not mean a high fidelity virtual reality system is required – rather, it is the authenticity of the problem, and the professional approaches to solving it, that will engage the learner to act "as if" they are a member of that professional community. Both forms are built upon about giving students an appropriate and authentic worldview with which to view, explore, define and solve problems:

There are a number of role conventions used in applied drama that inform and define the nature of the role-play functioning within these learning moments. Mantle of the Expert allows for participants to quickly engage in the profession being simulated by adopting an *attitudinal* role that does not require deep knowledge or experience, or high-level acting ability. By adopting the

attitude and discourse of the profession, students can start to engage in the tasks at hand, often inducted to the role as a trainee in that profession. In epistemic games, the participant takes on the identity of a real professional, using the discourse of that professional community to define and tackle a problem that would be encountered in that profession. The epistemic frame engages the student in role as a professional by prompting them to adopt the skills, knowledge, identity, values and reflective learning methods of that profession.

Shaffer emphasises that epistemic games should focus on authentic problems of significance in order to engage the learner in a valid and powerful task appropriate to the future needs of the students, and to give them a sense of power over their learning:

“If schools are going to adapt to new social and economic conditions, we need to develop viable alternative models of learning that excite parents, teachers, administrators, business leaders, politicians, and others who care about what happens in schools. And of course it would be important that these alternatives actually help prepare kids to be innovative thinkers in a complex, post-industrial world.” [19].

The designers of epistemic games seek to identify the ways in which professionals learn, and to replicate those elements of the practicum that lend themselves most effectively to the simulation environment. Although game-based, the tasks and problems need to be authentic. In *Mantle of the Expert*, again the enterprise or project needs to be genuine. Whether being approached from a drama or a game perspective, the tasks and problems at the centre of the learning experience need to be founded in a real world representation of the problems and problem-solving methods. In the more specific *Commission Model* developed by Heathcote, the participants will be engaged as real consultants and producers for a real client – though this level of fidelity is not always possible or practical for a broader range of project settings.

Nonetheless Table 2 emphasises that a key part of the authenticity of tasks in both drama and game-based learning approaches comes from the focus on producing work for a client, rather than for assessment by the teacher. The enterprise being explored by *Mantle of the Expert* needs to serve the needs of a client. In some cases, the client may be a real person or organization for whom the participants will produce and present work. Or the client may be fictionalised and incorporated into the drama. With epistemic games, the participants need to be working on a project or task that is considered appropriate and authentic to the profession. Again, this may involve a real or fictionalised client, but an engagement with professional mentors or practitioners where possible is an important element.

In both cases, it can be seen that access to and contact with real communities of practice – often more conveniently through a mediated, online form – might

allow for greater engagement between learners and professionals than might otherwise be feasible or possible. In applied drama the participants develop expertise by joining a community of practice via role-based drama, and serving the needs of a client. Epistemic games are fundamentally built around the real practicum of a profession, replicating key features of how members of the professional community learn.

Similarly, both approaches need to be developed around a problem that needs to be solved. In applied drama, the problem increases the dramatic tension for the participants, thus increasing their levels of commitment and intensifying the focus on producing a creative solution for the client. By adopting the values of the community of practice with which they are connected, in role, the learners engage with the skills, knowledge and values required to solve the problem.

Epistemic games are built around the real work problem-solving methods of a profession, and creative solutions stem from the tensions in the ‘conversations’ that take place between participants and a community of practice. By adopting the reflective practices of professionals, learners simulate the real processes that tend to separate professions from other endeavours. Learners adopt the professional ability to creatively solve previously unseen problems, and to effectively reflect-in-practice.

Finally, Table 2 illustrates how participants in both *Mantle of the Expert* and epistemic games are required to display the product of their professional labours. In a drama form, learning is often displayed in the form of an in-role presentation to the client (real or fictional). The learners are protected in their role as professionals, and can talk from a position of expertise rather than as students. In epistemic games, learning is also often displayed in the form of a creative outcome to the problem being addressed. Where possible, this should take the form of a professional presentation of outcomes to an audience, such as peers, a mentor, or even parents.

3. APPLIED DRAMA & EPISTEMIC GAMES FOR CRISIS MANAGEMENT SIMULATION

The application of these drama conventions to serious game design is one of the methodological goals of an Australian Research Council project linking Charles Sturt University (CSU) and the Australian Defence Force (ADF). This three-year project (2007-2009) is examining the potential use of digital game-based technologies and applied drama conventions to produce crisis management simulation tools for use by ADF Public Affairs personnel.

Hibbert and Hannan [20] have outlined some of the problems faced by military public affairs personnel in recent times, particularly in organisations that see their role as an irritating necessity, a waste of resources, or a dumping ground for difficult problems. Around the time of commencing operations in East Timor (now Timor Leste) in 1999, the ADF began a refocusing of Public Affairs activities around the needs of the

organisation itself, rather than direct media liaison. Over time, a model has emerged that sees public affairs activity as part of the chain of command, with a greater role in strategic planning.

However, public affairs activity is increasingly being seen as having tactical significance, with a potential for generating its own form of “battlefield effect”. Digital technology, for instance, has opened new channels for rapid communication of images, sound and text. The ADF must compete in an increasingly noisy media space for its messages to be heard. The speed with which audiences demand information also presents difficulties for an organisation that bases its responses on a clear doctrine and chain of command approach. The actions of some stakeholders, such as the media and politicians, are not always compatible with ADF processes. And like any large organisation – and the ADF is one of the largest within the Australian government – it suffers from its own internal communication problems.

In organisational and public affairs terms, a crisis is an “event, revelation, allegation or set of circumstances which threatens the integrity, reputation or survival of an individual or organization” [21]. The way an organization operates during a crisis can significantly impact on that organization’s ability to survive into the long term [22]. For the Australian military, the stakes are higher than for most organisations, because, in times of significant national crisis or conflict, the inability to communicate effectively may foster panic in the community [23], allow other organisations/countries to amplify their own agendas ahead of the stated Australian national interest and of course result in the loss of life.

The Australian Defence Simulations Office (ADSO), like similar military and emergency organisations around the world, is exploring more effective role-based problem-solving methodologies that can be delivered using digital technologies. The overarching goal of the project described here is to develop a serious game based on drama conventions that will be used to help participants develop a clearer understanding of personal decision-making processes, a deeper understanding of other team members’ perspectives, and a fuller appreciation of the intense and unpredictable nature of communication flow within crises.

A fundamental problem facing the research team is that some activities of the Defence Public Affairs personnel are not easily simulated or replicated in a digital or game-like environment. The field activities of personnel as illustrated in Figure 1, might lend themselves to some forms of simulation, such as the creation of virtual camera operators or military journalists to act as avatars in constructed simulation spaces. Indeed, this would be one relatively simple way to include DPA personnel in mission rehearsal and simulation exercises.

However, how might a game-like simulation or learning space be developed around the decision-making, and interpersonal relationships that make up a large aspect

of the activities of a Public Affairs professional? How might this be assessed against the desired outcomes of the organisation, or measured against the prevailing doctrine? How might interaction with various stakeholders such as media, politicians and the public be simulated?

A number of drama conventions derived from applied drama, process drama, and the Mantle of the Expert approach described above have already been used by the project team to better understand the culture of ADF public affairs, current training methods, and to assist development of initial simulation scenarios. Small-scale applied drama sessions with trainee public affairs personnel have used these conventions to explore, for example, the participants’ ability to follow ADF doctrine when decision-making under pressure. The trainees have also used applied drama conventions to role-play a crisis management scenario from the perspectives of different stakeholders likely to be involved.

During 2008 further scenario development will take place using these and other applied drama conventions as a design approach to identifying and simulating key aspects of the ways in which ADF public affairs personnel learn to be professionals in that field. In effect, we will be using applied drama to develop the types of understanding required to develop an epistemic game that reflects how Public Affairs professionals learn to solve problems through a particular epistemic frame.

Most importantly, this project will provide a point at which to merge two seemingly parallel developments in learning and teaching, epistemic games and applied drama. This will combine the potential benefits of an epistemic game-like focus on replicating practica and professional problem-solving approaches with the proven conventions of applied drama to rapidly engage participants in effective role-play scenarios, while protecting them through shifting levels of role-distance and role-protection.



Figure 1: Australian Defence Force Public Affairs field team at work, Afghanistan (date unknown) [24]

4. CONCLUSION

It is in the shared aims of attempting to create opportunities for participants to learn “as if” they are professionals that the potential benefits of applying drama conventions to serious game design are most apparent.

If, as Shaffer points out, professionals use judgment to solve complex problems that can't be addressed by rote formulas, and they learn to think as professionals through exposure to practica [25], then a shift in theoretical perspective might be useful for serious games designers. Serious games may be enhanced by adopting an existing dramatic approach that is already close to the nature of gaming, rather than designing structures and conventions from scratch, or based on the sometimes only superficially similar conventions of other forms such as cinema.

With more than five decades of theory and practice in this field, applied drama is a valuable element to be added to the ever developing mix of disciplines driving the research and development of simulations and digital games. There is now clearly a need for the conventions of applied drama to be more adequately described in terms that will help serious games designers.

ACKNOWLEDGMENT

David Cameron was partly funded for this work under Australian Research Council Linkage Project LP0775418

REFERENCES

1. Sawyer, B & Smith, P. (2008) “Serious Games Taxonomy”. Conference presentation available online at www.seriousgames.org.
2. Shaffer, D.W. (2006) *How Computer Games Help Children Learn*. Palgrave Macmillan: New York.
3. Shaffer, D.W. (2006) *Ibid*. p. 164.
4. Goffman, E (1974) *Frame Analysis*. Peregrine: Norwich.
5. Shaffer, D.W. (2004) “Pedagogical Praxis: The Professions as Models for Postindustrial Education”, *Teachers College Record*, 106, no. 7, July 2004, pp. 1401 – 1421.
6. Lave, J. & Wenger, E (1991) *Situated Learning: Legitimate Peripheral Participation*. University Press: Cambridge.
7. Carroll, J., Anderson, M. & Cameron, D. (2006) *Real Players? Drama, Technology and Education*. Trentham: UK.
8. Nicholson, H. (2005) *Applied Drama: The Gift of Theatre*. Palgrave Macmillan: Houndsmill.
9. Howell, P. & Heap, B. (2002) *Planning process drama*. David Fulton: London.
10. Heathcote, D. (1991) *Collected writings on education and drama*. Northwestern University Press: Evanston, Ill.
11. Haseman, B. (1991) Improvisation, process drama and dramatic art, *The Journal of National Drama*, July, pp. 19–21.
12. O'Neill, C. (1988) The Nature of Dramatic Action, *NADIE Journal –Journal of Drama Australia*, 12 (2).
13. Bolton, G. (1999) *Acting in the classroom: A critical analysis*. Heinemann: London.
14. Howell, P. & Heap, B. (2002) *Ibid*. p. 7.
15. Shaffer, D.W. (2006) *Ibid*. p. 159.
16. Csikszentmihalyi, M. (1990) *Flow: The Psychology of Optimal Experience*. Harper & Row: New York.
17. Heathcote, D. (2003) “A Vision Possible: The Commission Model of Teaching”, *Drama*. Winter, (11) 1, pp. 16 – 27.
18. Carroll, J. & Cameron, D. (in press) “Epistemic Videogames and Mantle of the Expert: A Communities of Practice Approach”, IDEA conference, Hong Kong.
19. Shaffer, D.W. (2006) *Ibid*. pp. 183 - 184.
20. Hibbert, Z. & Hannan, M. (2005) “Public Affairs as a Chain of Command Function”, Critical Management Studies Conference, July 2005.
21. In Galloway, C. & Kwansah, A. (2005) *Public Relations Issues and Crisis Management*. Thomson/Social Science Press: Victoria.
22. Lerbinger, O. (1997) *The Crisis Manager: Facing Risk and Responsibility*. Laurence Erlbaum: New Jersey.
23. Sandman, P. (2006) “Crisis Communication Best Practices: Some Quibbles and Additions”, *Journal of Applied Communication Research*, 34 (3), pp. 257 – 262.
24. Source: Australian Defence Force Public Affairs.
25. Shaffer, D.W. (2006) *Ibid*. p. 191.