

Chapter 8.8

The Narrative Event Diagram: A Tool for Designing Professional Simulations

Helyn Gould

University of Strathclyde, UK

Michael Hughes

University of Strathclyde, UK

Paul Maharg

University of Strathclyde, UK

Emma Nicol

University of Strathclyde, UK

ABSTRACT

Game-based learning and simulation is a powerful mode of learning, used by industries as diverse as aviation and health sciences. While there are many generic Virtual Learning Environments available to further education and higher education in the United Kingdom, there is no widely available open-source Web-based simulation environment for professional learning. The SIMPLE (SIMulated Professional Learning Environment) project has designed, created, implemented and is in the process of evaluating such an environment in a range of disciplinary settings. The simulations that

are being created place both undergraduates and postgraduates in a professional context where their work is, as it will be in the workplace, distributed between tools, colleagues, resources, anticipated, and unanticipated problems. One of the key tools that staff will use to create simulations is the “narrative event diagram”, a design tool as well as a means by which the narrative of the simulation is constructed. This chapter will describe the tool, its design history and context, its current use, and next design iteration. In particular it will show the interdisciplinary genesis of the tool’s design, arising from the confluence of computer science, information science, and narrative theory, and its power in designing professional educational simulations.

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INTRODUCTION

Simulation-based training, particularly as defined by Gredler (1996) has been shown to be highly effective in professional disciplines. It is true of professions where work is highly governed by protocol and procedure, for instance simulator training for pilots; and also in professional situations where ill-structured problems arise, and where affect and knowledge are key components of professional practice (Duffy and Cunningham, 1996; Bloxham and Armitage, 2003; Forrest et al., 2002 & 2003; Blackburn et al., 2003). In one study, nurses were taught to treat critically ill hospital patients *via* mini-lectures, workshops and simulator-based patients. The subject matter included digital assessment of respiratory, cardiovascular and renal systems, and pain management. Participants completed pre- and post-course tests, which showed statistically significant improvement; in the follow-ups at two months and six months later, participants reported long-term confidence in caring for acutely ill patients (Stedeford et al., 2003; Maharg, 2007a). Two general points can be made about this and related studies. First, the simulator-based patients were used to assess not only patient-handling skills, but also medico-scientific knowledge. Second, as an educational approach, simulation was used to enable students to learn the synthesis of skills and knowledge they would use in the workplace; but it was also used to assess that synthesis.

The key question for anyone interested in implementing such approaches is: how can educators most effectively create simulations of complex professional procedures? This chapter describes the methods adopted by the SIMPLE project (SIMulated Professional Learning Environment) to enable academic staff to visualise, design and implement complex simulations of professional procedures across a range of disciplines and professions. We begin with the context of simulation use, describing the background to the SIMPLE project, its objectives and audience.

Next we shall describe the development of one of our critical tools, the Narrative Event Diagram (NED), from a technical perspective. We shall then analyse aspects of its use and effectiveness when deployed by academic staff, and discuss possible future uses of the method that combines simulation with ongoing professional development.

CASES VS. SIMULATIONS

Cases or case studies are commonly used within the fields of Law, Medicine and Business. Harvard University in particular has embraced this approach to teaching and learning, sharing its cases with the wider academic community (Christensen, 1987; DeLacey & Leonard, 2002). A detailed but unstructured description of the professional case is presented to the student. Information is included but some structuring and analysis is required to 'make sense' of the situation. The role of the academic here changes to that of advisor and facilitator, while the student must actively participate to move the case forward.

Cases have proven to be effective vehicles for professional learning but have two principal drawbacks. The first drawback relates to the nature of the information provided for the student. The case has to be distilled and presented to the student, frequently in text form. The information then becomes static. The professional environment however, is dynamic in nature, as indeed is knowledge itself; it does not stand still while we work (Callon & Latour, 1981). The static aspect of a case study reduces the student's need to explore, direct, gather, dialogue and synthesize the case. Students are usually only able to explore this problem space through interaction with peers or tutors (though other learning aids may be used). At this point the second drawback appears. The use of role-play goes some way to address issues of interactivity, but often has significant resource implications. The resource implications of case-based learning are significant and correlate directly

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