

# Chapter 46

## Clinical Virtual Worlds

### The Wider Implications for Professional Development in Healthcare

**LeRoy Heinrichs**  
Stanford University, USA

**Li Fellander-Tsai**  
Karolinska Institutet, Sweden

**Dick Davies**  
Ambient Performance, UK

#### ABSTRACT

*The deployment of virtual worlds into clinical practice is gradually becoming an accepted if innovative approach. This chapter offers an overview of the application of virtual worlds in a healthcare settings with specific focus on the application of virtual worlds in clinical practice. When combined with dynamic patient data models, facilitators are able to customize and deliver real time immersive clinical training experiences in a range of contexts. Given that virtual worlds are now being implemented in some of the more complex areas of healthcare, this chapter then explores how the lessons being learnt in this context could be applied more widely to other areas of professional development in the healthcare sector and concludes that direct and valuable lessons from mainstream clinical practice with virtual worlds are ready to be applied now more widely in the healthcare sector.*

#### INTRODUCTION

Virtual worlds are increasingly accepted as part of the toolset for training in clinical practice. This chapter focuses on virtual worlds as a platform for training in the field of medicine and more widely in the field of professions allied to healthcare. The application of virtual worlds ranges from basic

medical training to the professional development of full clinical practioners. Originally stemming from text-based multiplayer games, virtual worlds enable scenario-based training for multiple users – a key reality in today’s team-based working environments. (See Graafland 2012) The deployment of virtual worlds for professional development in medical training is dependent on context and

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wider aspects. Today's stake holders range from traditional medical professions to allied health care professionals i.e. health care professions distinct from medicine, dentistry, nursing, and also emerging medical professions. The current generation of students and practitioners in health care are no longer naive regarding web based communication. Frequent exposure and use of these techniques during childhood and adolescence creates new demands and sets the scene for a new educational and training paradigm. Virtual worlds for development of both technical- and non technical skills as well as basic cognitive training are discussed. A review of ongoing projects using virtual worlds for professional development in general including different platforms and case studies is presented as well as lessons learned based on delivered attributes (Hew, 2010; Peterson, 2010; Wiecha, 2010).

Current aims in healthcare to reduce error in clinical practice has led to a recognition of simulated training in managing crisis situations (Knudson, 2008; Wallin, 2007). Serious games represent an emerging asset in view of this trend (Knight, 2010). Linked to this, virtual world technology is emerging in medical training and is a result of technology-supported, individualized teaching and training originally inspired from established and widespread leisure and entertainment games. Interactive and visualization based modes of learning are increasingly advocated. Virtual worlds have the capacity to engage and activate the learner by means of visualization even where the focus is on simple procedures or on scenario based training. Clinical virtual worlds enable role-playing serious games or multiuser virtual environments that are related to gaming technologies in which the users are represented in virtual worlds by avatars.

Serious games provide judgement-free environments in which the player(s) can safely "trial and error". In many ways this is comparable to game-play in childhood and adolescence. The ability to be 'good' at a game is not innate; skills are acquired and developed through repetitive

practice (Ericsson, 1993). One of the commonly assumed strengths using serious games is the capacity to engage and thus motivate the "player" i.e. learners who are represented in the virtual world by an avatar. .

Virtual worlds allow teams of professionals to train cases simultaneously, i.e. implicitly training collaboration and single professionals to train on multiple cases i.e. training multitasking. Training these non-technical skills are recognized as critical in reducing medical errors in dynamic high risk environments, like the operating room or the emergency department. Serious games also present training environments for complex disaster situations and mass casualty incidents, including combat care (Heinrichs, 2010).

Game-designers agree that optimal design of serious games focuses on engagement and thus motivation of the player and not primarily on educational content. Learning objectives must be well integrated and embedded into the design in advance. Realistic virtual surroundings, in which sights, sounds, and confusion are mimicked, provide a complete experience and improve preparation. On the other hand, the main current pedagogical approaches emphasize the need for self-regulated learning. This requires an active and constructive process wherein learners need to define goals for their learning and then, aim at controlling their performance and behavior in a specific context, e.g. virtual worlds enabling procedure - and/or scenario based training by means of visualization (See Section 3 of this chapter).

In summary, the primary objective of this chapter is to show how a diverse range of virtual worlds have and are being applied in clinical settings. In particular, it aims to demonstrate that a sub-set of virtual worlds, namely clinical virtual worlds, have differentiated from all purpose virtual worlds and are maturing into a specific category that can play a valuable part in the education of clinical professionals. The secondary objective of the chapter is to investigate how professional development in other healthcare professions is being

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