Chapter 46
Clinical Virtual Worlds
The Wider Implications for Professional Development in Healthcare

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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 setting 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 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 practitioners. 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...
Clinical Virtual Worlds:
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 develop-
ment 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 attri-
butes (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 entertain-
ment 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 envi-
ronments 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. Train-
ing 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 mim-
icked, 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 pro-
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 set-
tings. 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 de-
velopment in other healthcare professions is being