

Chapter 14

Immersive Virtual Worlds for (E-) Learning: Towards an Interdisciplinary Research Agenda

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ABSTRACT

Virtual worlds are becoming more popular and important for the information society, allowing people to meet “face-to-face” and at the same time be distributed across different places. This offers numerous possibilities of revolutionizing the way learning is realized over long distances and at a given location. However, current uses of environments like Second Life make it very clear that there is a lack of interaction, and the learning concepts that are tailored to these kinds of collaborative environments result more or less in the replication of “always the same,” but this time in a virtual world. An example is a typical lecture that is now available as an in-world podcast. This chapter examines current state-of-the-art approaches of learning in and with virtual worlds in relation to the features of such environments and then proposes a research agenda tailored to making the learning experience truly interactive, collaborative, multi modal, and situation- and context-aware.

INTRODUCTION

With the advent of Second Life, there has been an increased interest in utilizing virtual worlds for learning objectives. In addition, there are good reasons for this endeavor as such environments

offer “face-to-face” communication and at the same time allow the participants to be spatially distributed. However, looking at learning experiences in such virtual worlds reveals that there is a lack of learning concepts that make use of the distinguishing features of virtual worlds and ex-

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exploit the chances offered by these environments. The first part of this chapter examines what virtual worlds have to offer for learning purposes and analyzes the features of virtual worlds that add value to the learning experience and the learning outcome. The second part then ambitiously aims at establishing an interdisciplinary research agenda by focusing on three aspects that could make a difference for learning purposes: (1) the integration of autonomous agents as tutors and peers, (2) the seamless integration of users with special needs, and (3) the integration of real and virtual worlds.

VIRTUAL COMMUNITIES OF PRACTICE: A SOCIO-CONSTRUCTIVISTIC VIEW ON LEARNING

Two main development strands can currently be distinguished when reviewing work on learning in virtual worlds. The first one is centered on the virtual world itself. In such approaches, learning is targeted at mastering the art of controlling the virtual world itself, creating objects, and scripting simple actions. The second concept is to transfer real life teaching events into virtual world events, e.g. by providing lectures on demand or giving online lectures or seminars, which is nothing more than an elaborate video conference; often not based on didactic arguments, but with an aim to save time and cost. There are very few concepts that truly embrace the possibilities virtual worlds can offer. The TECH museum¹ is such an example, where the traditional concept of a museum has been enriched with the ideas of collaborative and social interactions, allowing the layman to participate in the curatory process and propose as well as develop exhibits, which interactively demonstrate technical principles.

Our approach to learning in immersive virtual worlds is based on socio-constructivistic conceptions that learning and knowledge are culturally

and historically interdependent. We are strongly influenced by Lave and Wenger's ideas about learning as participation in social context (Lave & Wenger, 1991; Wenger, 2000). They describe learning as situated in communities of practice, where learning extends beyond the pedagogical structuring context and involving the social world. According to Lave and Wenger (1991), social interaction is the critical feature for this function and they describe learning as a process where the learner becomes involved in a community of practice, representing beliefs and behaviors, the learner has to acquire. Situated learning theory descended from Vygotsky's social development theory (1978), where he claims that social interaction plays a fundamental role in the development of cognition.

Besides considering learning as a means of developing practice, learning can also be viewed as a means of development and change of identities (Wenger, 2000). It has important implications for learning, identity, and self esteem to be part of a community, both with peers and with family and friends. One of the characteristics of a community of practice is mutual engagement and participation (Wenger, 2000). A focal point of a community is a common goal. Each participant comes with his own repertoire and his own history to be distributed. In a virtual community of practice, people have the opportunity to share experiences, meanings, and repertoire, and thus create a common culture.

Through avatar mediation, immersive virtual worlds open up for bodily immersion and interaction, affording users the semantics of place, including deixis, indexical language, and body orientation. Compared to many other technologies, the characteristics of multi-user virtual environments are the presence of avatars, a shared space, and shared activities. Avatars can communicate via text, voice, or symbols. The multimodality conveys not just language symbols, but also information about the interlocutors themselves. Schroeder (2002) noted that in the context of virtual environ-

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