Chapter 7.3
Building Interactive and Immersive Imagery

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ABSTRACT

The influence of immersive gaming and simulations on e-learning cannot be understated. While there has been some successful harnessing of interactivity and immersive spaces for e-learning, more awareness of related fundamentals may enhance e-learning. This chapter discusses the role of graphics in interactivity (live and automated) and immersion and strategies for creating effective interfaces, virtual spaces, contexts, agents, and 3D digital learning objects.

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CHAPTER OBJECTIVES

- Define people-to-people and automated interactivity in the e-learning context
- Explore examples of interactivity in the e-learning context
- Define the "Z-axis" or immersiveness in the e-learning context
- Explore examples of immersiveness in the e-learning context (including ubiquitous immersion)
- Investigate a continuum of types of immersion in e-learning

- Discuss ways to set up, facilitate and debrief immersive e-learning
- Offer ways to evaluate immersive e-learning
- Explore the uses of live and automated imagery in interactive and immersive spaces
- Consider various image strategies in interactivity and immersiveness

INTRODUCTION

Some of the most complex digital imagery stems from interactive and immersive imagery. Digital imagery offers functionalities well beyond print in terms of interactivity and immersive experiential learning. Experiential learning exists in a cycle, with the individual first experiencing the event or set of events. That event is reinforced through the description and sharing of the event and observations from it. The events are interpreted, and relationships between the elements in that experience are formed. The learner then develops generalizations of the event and relates that experience to both the past and the future. Next, the individual prepares for the next experiences and determines how he or she may approach the future events differently (Jacques, 1985, as cited in Gredler, 1992).

Interactivity refers to the learners engaging with artificial intelligence robots; live communications and interactions with real people; branching simulations with particular actions and decisions expected of learners. Immersion involves full-sensory engagement (sight and sound inputs) in digital environments. Here, learners may be "disembodied" but enabled through avatars in multi-faceted, creative multiverses. To echo Isaac Newton's "Clockwork Universe" idea, some game designers create immersive digital universes with certain physics engine codes and then let it run with minimal inference—so participants in the immersive spaces engage each other without a larger game creator presence.

Immersiveness indicates the experiential engagement with three-dimensional environments that encompass and surround a user, with multiple sensory details. To enhance situated cognition, such spaces are used for social learning, systems learning, and open-ended self-discovery learning. Simulations may be actualized in immersive spaces:

Simulations find application in training, decision-making and research in science, education and a vast number of applied areas, such as national defense, ecology, manufacturing and economic forecasting. Sometimes simulations are cost effective substitutes for hands on experience, but increasingly they are used to facilitate decision-making and applied or theoretical research (Doubleday & Kurtz, Oct. 2004, p. 145).

Non-immersiveness may be used to describe some types of virtual reality that are partially virtual (Slater, Howell, Steed, Pertaub, Gaurau, & Springel, 2000).

INTERACTIVITY IN E-LEARNING

Interactivity may be human-facilitated and social (between people), or it may be automated and delivered by a computing machine. It may be live and synchronous, or it may be asynchronous. Interactivity may form just a portion of a curriculum, or interactivity may involve the whole learning. Interactivity offers opportunities to customize learning to individual users. It also offers strategies to make the learning engaging.

The goals from an interactive learning environment may involve the following, according to Barker (1994),

knowledge acquisition, skill development, skill rehearsal, problem solving and self-realization. Some things he suggests designers should consider to achieve these outcomes include: the