Chapter 2
Explaining the Educational Power of Games

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ABSTRACT

This chapter introduces two views of learning relevant for game-based learning: experiential learning theory and the constructivist view on learning. The authors will first discuss, how these views explain learning from a perspective that is relevant for game-based learning. They will also evaluate, how these views on learning relate to assessment of learning through gaming. Last, they will concretize the diversity of the potential learning outcomes of gaming: how, for example, the learner’s previous knowledge, personality, the team members affect the learning experience and outcome. According to constructivism, learning is a constructive process in which the learner is building an internal representation of knowledge. This is something to which game-based education clearly adds value to.

INTRODUCTION

Games as an experience-based instructional method have the potential to address many of the limitations of the traditional class-room education. They accommodate more complex and diverse approaches to learning processes and outcomes; allow for interactivity; promote collaboration and peer learning; and, perhaps most important, foster active learning (Ruben, 1999).

We believe that the practice of any instructional design – like educational games – should be based on some conception of how people learn and what it means to learn (Duffy & Jonassen, 1992a). Bednar et al. (1992) argue that effective instructional design emerges from the deliberate application of some particular theory of learning. This is our motivation for introducing the main beliefs in two learning paradigms relevant for game-based education. As researchers we are interested in whether the experiential learning theory (ELT) or the constructivist learning paradigm are able to increase our understanding about the learning processes that take place in game-based learning activities. ELT has been the background for arguing (computerized) game-based learning at least since the early 1980s,
but it seems that the game community has not fully noticed the constructivist message emerging from the discipline of Education (Lainema, 2009).

Besides of introducing the two learning paradigms, we will also reflect on a recent game-based learning case and describe the diverse nature that may take place through gaming. Finally, we will conclude that learning is a constructive process in which the learner is building an internal representation of knowledge.

In this chapter we use the phrases game and simulation game interchangeable. The word simulation emphasizes that the purpose of the game is to describe the behavior of a complex real-world system (like the functioning of a business organization) on a computer model over an extended period of time. Although not always explicit, our discussion concerns educational (simulation) games and educational gaming. With all of these terms we mean a computerized game, the goal of which is to help the gamers to learn something relevant that can be transferred into real-world environments. Business (simulation) game is defined as a sequential decision-making exercise structure around a model of a business operation, in which participants assume the role of managing the simulated operation (Greenlaw et al., 1962).

EXPERIENTIAL LEARNING

According to Experiential learning theory (ELT), the most powerful learning comes from direct experience – through action taking and seeing the consequences of that action. Learning is said to occur through the resolution of conflicts over different ways of dealing with the world. ELT suggests a holistic integrative perspective on learning that combines experience, perception, cognition, and behavior (Kolb, 1984).

Kolb (1984) describes the experiential learning model as: (p. 21): “an integrated process that begins with here-and-now experience followed by collection of data and observations about that experience. The data are then analyzed and conclusions of this analysis fed back to the actors in the experience for their use in the modification of their behavior and choice of new experiences”. Learning is conceived as a four-stage cycle shown in Figure 1. Immediate concrete experience is the basis for observation and reflection. Observations are assimilated into a theory from which new implications for action can be deduced. Implications or hypotheses then serve as guides in acting to create new experiences.

Kolb especially notes two aspects of this learning model. The first is the emphasis on...