

Chapter 49

Challenges of Serious Games for Improving Students' Management Skills on Decision Making

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ABSTRACT

Serious Games have been used in civil education since the 1950s. The first serious games were business games aiming to improve the skills required for decision making processes. In 1964, the INTOP simulation game was the first game representing a complete enterprise operating in different markets (Rohn, 1995). Management games as a subgroup of serious games are still widely in use, especially within vocational training of managers. Since that time, a variety of games have been developed and proved successful for the mediation of skills in complex systems (Windhoff, 2001). Serious games are also widely used in primary and secondary education nowadays. Children learn excellently by playing them. In contrast, learning by gaming is often seen as not serious enough within higher education and vocational training. Consequently, gaming as a teaching method is still often excluded in many curricula. Hence, students lack the experience of active knowledge acquirement during lessons and thus encounter a barrier for successful participation in serious games later.

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INTRODUCTION

This chapter discusses first, why we mean that serious games should still be considered as a suitable learning method for mediation of management skills, which barriers arise and how to overcome the barrier. The chapter is based upon the experience of using management games in an environment being open and reluctant to gaming as a learning method. The outcome of this chapter will be an approach for reducing the barriers of adoption. This approach will also take cultural and gender issues into account, since these both affect the learning outcome as well as have an impact on the design of the games.

Manufacturing today is often a complex process, involving several partners around the world (Wiendhal & Lutz, 2002). The products are more customized and have shorter life-cycle times, which increases the marginal cost per product (Sheer, 2002). One of the consequences of being a part of a dynamic organisation is that the employee faces changing working environments and therefore there is a need of continuous learning not only by employees (OECD Observer, 2004) but also for organisations (Schwesig, 2004). As the employee is the person in an organisation that performs and lives collaboration, the organisational success will mainly depend on his capabilities to learn and act in a dynamic environment (Windhoff, 2001). Decision makers, like people in general, are prone to the misperceptions of feedback. This means that their performance in complex and dynamic systems is hindered by non-linearity, time delays and feedback structures (Sterman, 1989). Decision making in dynamic systems is hard because it calls for dynamic decision making, which is a stream of decisions closely depending on one another. Last, decision makers are also limited by the magical number seven plus or minus two (Miller, 1956). This number sets the maximum number of cues, which can be simultaneously considered by people while evaluating a problem. Nevertheless, managers need to take decisions. Consequently,

it is a main objective of an educational institution to prepare their students as best as possible on the new working requirements and give them the opportunity to acquire management skills during their studies. Thus, the question is: which skills does an employee need in order to perform well in collaborations, and how is it possible to mediate skills in such a way that he can act as needed when a new situation arises.

Due to higher complexity and higher degree of collaboration, communication skills (Probst and Büttel 1994), social competences as well as the knowledge and skills that determine how to handle relationships with others (Swart and Wild 2001) are becoming important for carrying out collaboration on the individual level.

For us, collaboration skills comprise all skills necessary in order to perform well in collaboration. In order to perform well, the person needs to have competencies in communication and cooperation, as well as the ability to see how a participants' own behaviour impacts collaboration performances and to change their behaviour if necessary.

IMPACT ON THE NEEDED COMPETENCIES OF ENGINEERS

Preparing an organization for the new requirements requested by dynamic networks is not only a matter of finding suitable technical solutions, but also that of qualifying the employees and preparing organizational structure. Indeed, successful co-operation does not only rely on a seamless information flow between all partners, but also on the ability of the participating organizations to learn and to act in a dynamic environment. Such a living and learning organization can be characterized by the possibility of and room for the development of creativity and individuality in and outside the organization (Fuchs-Kittowski, 1998). Important parameters involve deriving information out of the process of self-organization as well as collecting and processing information

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