Chapter 15
Educational Games

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ABSTRACT

The market favors the best-selling computer games regardless of their social and educational effects. This chapter will discuss the present trends in educational games development, technologies related to them as well as their features, through representative examples of games used for education with respect to pedagogical, business, and social aspects. Benefits and limitations of introducing games in education will be pointed out. Computer games for the disabled along with their pedagogical and social effects will be presented. Recent research results on the implementation of video games in schools and educational game evaluation will be presented in the chapter, based on the experience in the development, implementation, and evaluation of several interactive e-learning educational exercises, as well as in the development and validation of several innovative computer games for the visually impaired.

INTRODUCTION

Every child and the majority of adults enjoy playing games. Games were used for the purpose of education before computers entered everyday life, but in view of the important role that computer games have in the entertainment of young people today, obtaining an advantage in education from computer games became the focus of a number of studies. Most young people are familiar with IT and they spend several hours daily in front of computer screens. Most of them have Internet connections at home and while studying, they retrieve most of the information they need from the Internet rather than from a library. Their perception abilities are predominantly audio-visual, they learn more easily from images than from text. Their capability of multitasking in their activities is outstanding, they can focus on multiple parallel objects, and they are able to switch between activities quickly. They seem to be impatient, as they expect immediate answers to their questions.

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The widespread use of social networks points at their need for company and associates; they like to belong to groups and to work in teams. This feature of young people existed in previous generations too, but the difference is that today's contacts are not necessarily personal, and that the physical and the virtual partly overlap. These circumstances have led to a different way of learning and different expectations regarding education. For example, games enhance the ability to connect the virtual and the physical, thus helping the development of different skills. Young people today prefer to learn by exploring, discovering and doing rather than by being told facts and given instructions. They seek interactivity in every segment of learning. These new aspects of the learning process can be exploited by taking the advantages that games offer as opposed to traditional learning and teaching methodologies: they attract learners, they activate learners' imagination, curiosity and the desire for challenge and they also offer a wide range of possibilities to work in teams.

Educational games compose a special group of video games, with particular requests on technology, design, and cost. At The National Summit on Educational Games held on October 25, 2005 in Washington, DC, sponsored by The Federation of American Scientists, the Entertainment Software Association (ESA) and the National Science Foundation, nearly 100 experts discussed the ways of accelerating the development, commercialization, and deployment of new generation games for learning in order to find answers to the questions: (1) why the United States should focus on digital games for learning, (2) what research is needed to improve games for learning, (3) what stands in the way of introducing games and simulations to education and (4) what should the government, industry, and education community do to get educational games to teachers and learners.

After a brief discussion of present trends in educational games development, some statistical facts will be given from the economic point of view. The second section gives more detail on technologies and features through representative examples of games used for education worldwide with respect to pedagogical, business, and social aspects. The main benefits and limitations of introducing games in education will be pointed out in a subsection. The third section is dedicated to some innovative computer games for persons with disabilities. An analysis of pedagogical and social effects of educational games is given in a subsection. Recent research results on the implementation of video games in schools, and an educational game evaluation will be presented as well. The final section contains some concluding remarks and future lines of research.

Trends in Educational Games Development

In recent years educational computer games have received increased attention from researchers, educators, and learners. Being a multidisciplinary issue, educational games are in the field of research of various disciplines such as psychology, literature, media studies, sociology, educational theory, and computer games studies (Gros, 2007).

While in the nineties e-learning was going through a crisis because the huge amount of information it could offer was static, today's trend is towards creating learning systems adaptive to learners. The new methodology requires monitoring the learning process, collecting data from the users and introducing dynamic changes of learning methods, depending on the learners' needs (Moreno-Ger, et al. 2008b). Learning models are neither linear nor static, hence, computer games can meet these new requirements without losing any of their amusing aspects.

In the past the main issues about introducing games in education were whether to use games in education or not, whether the games are useful or not, and how much benefit they bring to the learning process. At present the main questions are rather different. One of the research topics is to what extent the games are cost-effective. This