# Interactive instruction

Michael D Kickmeier-Rust, of the Department of Psychology at the University of Graz, Austria, heralds the educational potential and future of computer games…

The idea of using 'cool' modern computer games for serious, particularly educational purposes, is thrilling educators, researchers, and developers. The genre of learning games has become a major field of psycho-pedagogical research and quite certainly those games will play an important and accepted role in the future educational landscape.

But why is this educational medium so popular? In the first instance, it is rooted in the popularity of computer games in general. Computer games have become the preferred leisure activity; statistics say that about 70% of European households play computer games, the average player spends one to two hours a day on playing those games, and multiplayer online games like World of Warcraft have developed a community of several million active subscribers.
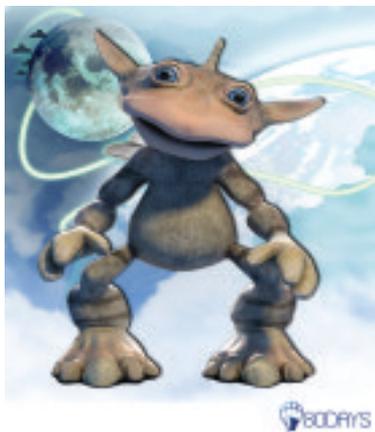
Of course, the phenomenon of quickly utilising new media and new technologies for educational purposes is not new – just think about television or computers and the internet. Most of these technologies seriously changed everyday life and the educational landscape. Computers and the internet, for example, have given birth to the economically and educationally enormous field of e-learning. And in this tradition, I am convinced, educational computer games will also change when and how people learn.

Computer games won't solve all our educational problems, and they won't be a Nuremberg Funnel, but as opposed to previous – even interactive – media, computer games provide entirely new possibilities: they combine a terrific visual appeal with radical interactivity and user control, they combine clear goals and tasks with fascinating stories, they combine enthralling fantasy with curiosity, and combine social interactions with strong yet positive competition. And this is significantly more than previous media could. In a natural way, computer games can make learning meaningful and important and make knowledge a desirable and relevant good.

On this playful basis, we might make learning a more pleasant activity, maybe a more effective activity (for which we occasionally find evidence), maybe more suitable for the 'digital natives', but definitely we can reach those children and adolescents we could not reach satisfyingly with conventional educational measures.

As a matter of course, we are facing significant challenges on our way to create successful educational computer games and we have to invest in further research. Examples are the challenge of controlling the immense costs of learning games that can compete with their commercial, non-educational counterparts, the challenge of finding a suitable balance of gaming and learning, the challenge of real-time adaptation that is so important for the fragile motivation to play, the challenge of finding the subtle balance between challenges and abilities, and the challenge of utilising the educational potential of social interactions through multiplayer games. Significant efforts are made addressing these challenges, for example, in the context of 80Days (www.eightydays.eu), an interdisciplinary research project funded by the European Commission.

I am convinced about the educational potential and the educational future of computer games and I am curious to see the upcoming new learning ones, since, as Marshall McLuhan, Canadian Philosopher and Scientist, pointed out: "Anyone who makes a distinction between games and learning doesn't know the first thing about either."

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80Days at the University of Graz

Digital game-based learning…

The 80Days project (www.eightydays.eu) is a leading-edge research project focusing on digital game-based learning. The project consortium is composed of seven interdisciplinary European partners and is funded by the European Commission under the 7th Framework Programme. Inspired by Jules Verne's novel 'Around the world in eighty days', the project aims at developing robust psychopedagogical and technological foundations for successful digital educational games, with a strong focus on intelligent adaptation and personalisation of the gaming experience.

To accomplish this significant step forward toward successful and effective educational games, 80Days is addressing two main objectives: integrating models of adaptive personalised learning with those of adaptive interactive storytelling; and merging virtual game environments with existing learning resources, thus reducing development costs and time. The project's endeavours enable the understanding of active learning processes within a virtual learning environment and are educing a strong adaptive and responsive system that is fully exploiting the learners' capabilities. In addition to the innovative and advanced methodological and technological framework for effectively developing successful educational games, 80Days is developing a compelling demonstrator game teaching eighth grade geography in an 'alien' adventure.

80Days was initiated and is coordinated by the University of Graz, Austria. The Cognitive Science Section at the Department of Psychology, with its Head Professor Dietrich Albert, was already a strong partner of ELEKTRA (www.elektra-project.org), an awarded European project on game-based learning and a direct predecessor of 80Days.

Founded in 1585, the University of Graz has a rich heritage and a long tradition. It covers a wide spectrum of disciplines, ranging from theology to humanities, law, economics and natural sciences, especially bio- and nanotechnology. Numerous outstanding scientists have taught and researched at Austria's second largest university, among them six Nobel Prize winners.

As a modern scientific institution, the University of Graz pools first-rate research on an international level in numerous projects and cooperations. Special research programmes funded by the Austrian Science Fund as well as a national research networks are coordinated here. The University of Graz plays an important role as a strong partner in the EU Framework Programme. The university participates in five Networks of Excellence within the 6th Framework Programme: psychologists elaborate new e-learning concepts. Physicists investigate the feasibility of optical data transfer on the nanoscale, and chemists investigate polysaccharides as renewable raw materials. Historians from 45 institutions seek innovative approaches to research European history, and jurists deal with a new European private law.

Featuring a large expertise in information technologies, the University of Graz runs – among other topics – several projects broadly focusing on information and communication technologies, for example:

- GRAPPLE – Generic Responsive Adaptive Personalized Learning Environment (FP7);

- REPLICATOR – Robotic Evolutionary Self-Programming and Self-Assembling Organisms (FP7);

- SYMBRION – Symbiotic Evolutionary Robot Organisms (FP7).

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