

Recently research into the use of advanced computing technology in education has been one of the central themes in educational research. Studies on the design of and interaction with computer simulations and serious games are abundant. However, having a successful simulation or game implemented in real classrooms is a highly non-trivial problem. Conditions at schools may be unfavorable when compared to the research lab and teachers may have trouble aligning the principles underlying the technology with their preferred way of teaching. For instance, the simulation or game may provide a specific structure to the learning process such as a strict implementation of an inquiry cycle, incompatible with a more open-ended approach by a teacher. This means that there should be an additional cycle of design, not of technology but for the education with the technology. Using simulations or games requires that teachers design the particular way in which the technology will be used. Teachers should be supported in this design and develop professional competencies to be able to adopt their use of technology for their educational goals. In this symposium we present four case studies in different educational contexts, varying from special needs education and language education to two cases in the science classroom. All cases use advanced technology to achieve specific goals that would be harder to reach without technology. For each case, particular difficulties and solutions to support teachers will be presented. In the discussion we will try to find common ground and general lessons learned.

Model-based Learning using Virtual Pink Dolphins for Special Needs Education??

Case studies, Special education, At-risk students, Model-based reasoning

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The number of reported Autism Spectrum Disorder (ASD) has increased rapidly in the recent year. Virtual Reality (VR) as a technology has been studied an alternative intervention for the ASD for special education and neuro-rehabilitation. This research is interested in the development of model-based learning using virtual pink dolphins for learning in a virtual environment for children with ASD. An immersive room was created, presenting a virtual basin in which pink dolphins swim. Children use the environment to learn language and counting. The study shows, that, in particular for this special group of children, designs of the tools is not enough. Careful design of the learning situation and specific tasks is needed to reach a level of acceptance by students, teachers and parents.

Investigating an Intervention to Support Computer Simulation Use in Whole-Class Teaching

Qualitative methods, Quantitative methods, Educational technology, Science education

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Going beyond simply measuring the effectiveness of a teaching approach with computer simulations during whole-class science instruction, we investigated the interaction between

teachers and their students as well as searched for mechanisms in the pedagogical context related to teachers' implementation of the intervention. Our quasi-experimental design involved having five teachers teach Newtonian mechanics with computer simulations to parallel classes of their upper secondary students, in an Accustomed condition and a Peer Instruction condition. We investigated the pedagogical interaction between teachers and their students, which was expected to be affected by the intervention's performance support for the teacher as well by the teacher's learning support for the students. Learning effects as revealed by gains from pretest to posttest to delayed posttest did not consistently favor either condition. Identified mechanisms occurring in the pedagogical context that could explain our findings include: teacher's sense of ownership of the lesson, familiarity with the intervention conditions, and rivalry with the researcher's approach. Suggestions for future research related to these mechanisms are offered.

Identifying hurdles for large scale uptake of games and simulations in the classroom

Design based research, Educational technology, Teaching/instruction, Game-based learning, Inquiry learning

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In educational gaming and simulation environments students are engaged in active exploration process instead of merely witnessing something being presented, based on the evidence that students learn better when they have an active role in the learning process (Bransford, Brown & Cocking, 2000). In many gaming and simulation environments the learning process is fairly structured and controlled, because evidence shows that many students have difficulties without proper assistance and guidance (Mayer, 2004). However, what is increasingly worrying is that the benefits of (pre-)structuring the learning process seems to be taken for granted. There has been surprisingly little discussion about the potentially adverse (i.e. negative) effects of structuring of the learning process. In our view, these potentially adverse effects should be acknowledged and more explicitly addressed before we can expect simulations and games to play a more significant role in formal education. In the current paper explores some of the effects that the (pre-)structuring of the learning process in educational games and simulations can have on two key stakeholders, students and teachers. Based on two examples from our own research this paper argues that in order to obtain learning outcomes, different learners need different structuring, but also that the strong focus on outcomes in both simulations and games might very well go at the expense of two other important aspects of active learning: process and interest. It also argues for the acknowledging the importance of teachers as gatekeepers for preventing and resolving these issues in the learning situation.

A Study on the Effectiveness of a Serious Game for English Pronunciation

Educational technology, Second language acquisition, Language (Foreign and second), Primary education, Secondary education

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