

## Guest Editorial: Overcoming the Technological Hurdles Facing Virtual Worlds in Education: The Road to Widespread Deployment

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Overwhelmingly, most current studies on the field of educational use of virtual worlds focus on educational theory and practice (Hew & Cheung, 2010). While we see this as natural in a field centred on pedagogical practice, it is also a shortcoming in the large body of literature developed on this subject in recent years. Education-centred studies tend to adopt a static view of technology, as something that has to be employed in its current state or something that was merely developed with the specific intent of fulfilling a predefined purpose (Duncan et al., 2012). Consequently, the technological perspective of such studies typically limits itself to identifying limitations/restrictions of specific virtual worlds – not of the concept of virtual worlds in general.

This is in stark contrast with the technological research viewpoint: from it, virtual worlds are artefacts. That is, they are embodiments of development processes, concrete renderings of knowledge (Hevner, 2007). By coming into existence, they generate new technological knowledge, and enable new educational processes. Hence, they are not just static facts, to be dealt with “as is.”

This special issue was launched following this technological perspective, and called for contributions towards an updated understanding of the technological challenges that virtual worlds face when applied to education and training, and towards an identification of research directions to overcome them. As a starting point, three fields were suggested as open for contributions, albeit contributors could also suggest others:

- making the virtual worlds technology available to educational actors;
- content production in virtual worlds to support advanced interactions beyond plain dialog;
- large scale deployment of virtual worlds and integration with current information systems.

The paper by Gregory et al. helps set a perspective on the challenges this technology faces, by aiming to provide an overview of barriers and enablers from the educational actors’ side. They attempt to determine why virtual worlds not only didn’t become mainstream but even lost some popularity, based on a survey of over 200 academics, with results examined in view of their prior, current, and expected use of virtual worlds.

Muñoz-Cristóbal et al.’s paper provides a feasibility example. This paper addresses the difficulties teachers face in order to create and share their designs across virtual worlds, as well as the (lack) of integration between virtual worlds and other educational technologies. They present a system focusing on learning situations across different platforms, including Web-based, augmented reality, and virtual Earth globes. The paper evaluates the system in the context of teacher-based deployment of learning activities across different spaces, providing data to support the adoption virtual worlds in everyday teaching and institutional practice.

Cruz et al.’s paper steps back from teaching practice and takes an organizational perspective. They reflect on why and how identity federation may be required to overcome barriers faced by institutions wishing to use virtual worlds. Their set of scenarios present this issue across various organizational dimensions of the educational process, and expose it via concerns such as identity, traceability, privacy, accountability, and interoperability. Their presentation of this issue is completed with pathways towards operational solutions.

Coban et al.’s paper contributes with a plethora of everyday practice and organizational details – as well as impacts on pedagogical issues – providing a better understanding of how technology must change in order for its widespread use to become a reality. Their data stem from a welcome one-year longitudinal observation of two cases, using two different virtual worlds, from the perspectives of designers, practitioners, and administrators.

This issue concludes with a final paper, by Laine & Sedano, who bring to fore the issue of virtual worlds evolution in the light of the current trend towards pervasive technology. Their case study explores the concept, possibilities, and challenges of combining a virtual game with sensor-enhanced players’ activity in the physical world. Through their

study, valuable steps are made towards design, development, and evaluation of virtual worlds that combine virtual and physical elements.

We consider that this special issue contributes to provide an updated and alternative point of view from the technological perspective about some aspects that could help to overcome some of the identified issues with the actual deployment and use of virtual worlds.

Finally, we would like to thank all the reviewers for their great work in selecting and improving the papers with all their insightful comments.

## References

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