Open Virtual Worlds for Exploratory Learning

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Continuing advances and reduced costs in computational power, graphics and network bandwidth have led to 3D immersive multi-user virtual worlds becoming increasingly accessible while offering an improved and engaging quality of experience. Many educators have seen the potential of virtual worlds for learning activities since their appearance as a new type of Internet service ten years ago. Much initial use involved recreating familiar educational situations such as online tutorial groups, presentations and lectures in these novel virtual worlds, albeit enhanced by the exotic nature of the surroundings and the users′ avatars. Although this type of use is relatively lightweight educationally it is clear that students enjoy the nature of the unusual social settings and "in-world" experiences, and engage positively with the technology.

Virtual worlds are now moving into a new phase, which make them much more suitable for educational use. In particular there are now open source platforms which enable educators to take full control of the behaviour and content of a virtual world.

In his ITS 2012 keynote speech Colin Allison introduced reports on the educational benefits from the new generation of open virtual worlds. The breadth and depth of the potential of open virtual worlds is illustrated by example learning environments from both the STEM and the Cultural Heritage domains. WiFi Island shows how interactive multimedia can be augmented by virtual laboratories; Routing Island illustrates how complex algorithms can be interacted with and visualised in totally new ways; detailed reconstructions of important historical buildings which are now in ruins are illustrated by an 8th century Byzantine Basilica at Sparta and St Andrews Cathedral as it was in the 14th century. Of course there are challenges: programmability, scalability, support for developers, creating appropriate management facilities, how to distribute and deploy 3D learning environments; how to adapt to the network Quality of Service to support a suitable Quality of Experience for end users. Our experience of developing and deploying these exploratory learning facilities allows us to explain how to address both the needs of educators and the technical challenges encountered when adopting open virtual worlds for teaching and learning.

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