



PROJECT ABSTRACT AND EXECUTIVE SUMMARY

**Problem-based Learning in Virtual Interactive
Educational Worlds for Sustainable Development
(PREVIEW-Sustain)**

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June 2011

Abstract

This development project built on an earlier JISC-funded collaboration with the Higher Education Academy's Psychology Network, which developed immersive collaborative tutorials and materials in the 3D online virtual world Second Life. In the first project of its kind, teaching materials and methods were reused and adapted to introduce the 'Education for Sustainable Development' (ESD) agenda to academic staff and students across different subject groups. By using a variety of innovative virtual worlds techniques, including customised problem-based learning scenarios and web videos filmed in a virtual world (machinima), the team developed a series of brief learning scenarios that highlighted the motivational and behavioural factors that impact on sustainability (e.g. resources, recycling and energy efficiency).

Executive Summary

In 2005, the UK Government's sustainable development (SD) strategy placed strong emphasis on the role that education can play in both increasing awareness in young people about SD and giving them the skills to actualise SD. It placed the focus firmly on the development of 'sustainability literacy' for UK graduates. This was also mirrored by the United Nation's pledge in the same year to a 'Decade of Education for Sustainable Development'.

Given this remit and agenda within UK higher education, it is surprising that there appears to be little exploration and development of experiential methods of teaching, such as problem-based learning (PBL) using innovative 3D virtual worlds, explicitly for ESD. Over the last five years in particular, there has been a

rise in the educational use of online virtual worlds as a platform for teaching and learning – and educationalists have been swift to adopt these methods for use in a variety of innovative ways within the HE curriculum.

This project aimed to adapt and further develop existing PBL techniques by adapting and transferring them to the ESD agenda and further exploring ways to utilise 3D virtual worlds to promote ESD within the sector. The approach adopted in this development project was grounded in action-research and an iterative process of open and participatory evaluation and development.

Both virtual world, avatar-driven PBL scenarios and web-videos filmed within the virtual world were used to exploit the platform for brief ESD scripted scenarios. Piloting and small group sessions assisted in developing materials suitable for open source distribution. Questionnaires and informal discussion groups were also used to evaluate these innovative methods.

Students reported that the PBL sessions on sustainability were engaging and enjoyable. However, during staff sessions it became clear that the investment of time to learn the skills required to facilitate PBL sessions and to develop specific ESD and embedded subject specific materials was too great. Therefore, alternative ways of utilising the virtual world for ESD were explored and a series of virtual world avatar-based web videos were constructed around the same pro-environmental and sustainable issues (resources, recycling and energy efficiency). These proved successful and popular with staff as they could be easily distributed and uploaded to Blackboard (a text-based, virtual learning environment) and therefore offered across the curriculum and embedded within existing programmes of study.

Investment of time to learn the skills necessary to facilitate and develop ESD sessions in the virtual world can allow immersive and interactive small group sessions. However, this may be effective for only a small proportion of HE staff with commitment to using innovative technology-enhanced learning in addition to a willingness to situate ESD within their subject-specific teaching and learning materials. For greater impact and uptake, asynchronous internet-streamed videos of avatar-enacted 3D virtual scenarios can be specially developed to easily embed within traditional 2D virtual learning environments. Academics familiar with 3D virtual worlds such as *Second Life* and wanting to embed ESD scenarios within the curriculum can develop and facilitate small group virtual world PBL sessions effectively. However, for broader impact, staff should consider utilising the virtual world for filmed customised avatar scenarios that can be embedded within and across existing subject teaching materials.