

A Higher Education Academy ESD Resource

Title: e-Learning Case Study for ESD and Archaeology

Lead: Dr Armin Schmidt, University of Bradford

A.Schmidt@bradford.ac.uk

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AUDIENCE

This information will be of interest mainly to those teaching Environmental Archaeology but also to those interested in creating games as learning resources.

SUMMARY

Based on the assertion that we can learn from past societies how human action can seriously impact on the environment, it was decided to create an e-Learning resource that demonstrates how this can be used to incorporate ESD (Education for Sustainable Development) into archaeology teaching. A web-delivered computer game is being developed that allows students to explore the relationship between environmental factors and human decision making for an early farm in the harsh environments of Iceland.

THE APPROACH

The project creates a model for embedding ESD explicitly into the curriculum. Rather than setting up new modules or attaching stand-alone ESD lectures, the project uses the structure and content of existing modules in Stages 1 and 2 of the undergraduate programme to build on students' interests and blend ESD e-Learning activities into their mainstream programme. The staff teaching team investigated how and where ESD links are currently being made and identified opportunities for enriching these aspects through this project. The material is based on existing modules related to the archaeological record of activities of past societies and their consequences for the environment and subsequent settlements. The particular example is the Viking settlement in Iceland and its anthropological impact on the environment. A computer game is created to demonstrate the impact of decisions about different parameters (e.g.,

requirement for food, population size, animal stocks) on the outcomes, such as land clearance, soil erosion, food production and related issues such as water supply.

When contrasting the request for accuracy in the representation of human-environment interactions in an e-Learning tool with the complexity of the available two ecological models, their IT implementation and the way a game could be programmed, it became clear that the development of a simplified ecological model that is 'reasonably accurate' but can be implemented as a computer game is a major challenge. After a consultant was found to develop the computer game for the project, discussions with him helped to clarify the level of complexity that could be implemented and visualised. Research into ecological modelling in general, and into the two relevant models, was subsequently conducted. As a result, an ecological model was designed that retains various features of these models while simplifying others.

The project coordinator undertook to design the ecological model and help a consultant experienced in the development of multimedia courseware with its algorithmic implementation.

THE OUTCOMES

It has become clear that the main emphasis of this project has to be the ecological model and its implementation as a game. The resulting learning resource will hence mainly be of value in the teaching of Environmental Archaeology, a subject in which the project coordinator does not teach himself. He therefore makes this new resource available for colleagues to use in their own teaching. Given the initial enthusiasm and the general desire to incorporate ESD into the curriculum, this will be achievable.

Students approached this resource initially very much as a computer game, especially since according to their own accounts, they were 'avid gamers'. This showed that this resource, borne out of a fairly accurate ecological model, is more tailored towards reflecting real relationships rather than focussing on all the interactions and feedback that are built into computer games to make them exciting and interactive.

After discussing the underlying ecological model with students in more detail they appreciated the academic validity of the resource and were able to see that the aim of this game is different from those games they are normally playing (they made very useful suggestions to increase its gaming appeal). This emphasises the fact that this resource was not created to fully satisfy the need of gamers but to complement the teaching of ecological and sustainability issues with an appealing resource that can bring the 'dry' relationships to light. It is hence essential that the game is accompanied by an in-depth teaching session that explores the ecological model and explains how different parameters interact and how human behaviour and decision can change the outcome. When this is then

followed up with the game, students do appreciate that the academic content is visualised and are aware that the game is played with an educational purpose.

Students were able to see how issues of sustainability are covered by this resource but felt that a human dimension is essential to make it really relevant. Dying sheep alone are not enough to raise concerns about sustainability.

TAKING IT FURTHER: LESSONS AND SUGGESTIONS

- Staff showed considerable interest but also reservations in terms of underlying philosophy (non-deterministic) and requested scientific accuracy of the planned product.
- Students were very supportive of the project and showed high awareness of the required level of complexity of the product.
- The development of an accurate ecological model that can nevertheless be implemented is a considerable challenge.
- The implementation of such an ecological model as a game is a considerable challenge.
- The time spent by the project coordinator working on these challenges himself proved to be much more substantial than anticipated.
- Since the project coordinator is not teaching the subject of the final product himself, he has to promote the resulting resource for adoption by colleagues in their own teaching.
- The game that was created with the funding of this project is a prototype. There are various issues that should be changed in a second phase to make it more interactive (additional user input options) and to demonstrate more clearly the impact of the human farming society. Incorporating some of the relationships from one of the ecological models (Farmcompact) could do this.

FURTHER INFORMATION

The full report is available:

http://www.heacademy.ac.uk/assets/York/documents/ourwork/tla/sustainability/esd_schmidt.pdf
(PDF468KB)

The project website is at:

<http://www.brad.ac.uk/archsci/sustainability/>

The game is at:

<http://www.3wsonline.com/farmright/final/>

Instructions for the game are available:

<http://www.brad.ac.uk/archsci/sustainability/GameModel6.pdf> (PDF 40KB)