

### A Higher Education Academy ESD Resource

Title: Science 4 Sustainability  
Lead: Dr Timothy Barker, University of Leicester  
[tim@timbarker.org](mailto:tim@timbarker.org)  
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#### AUDIENCE

This information will be of interest to anyone wishing to make physics more attractive to potential students by engaging them in the sustainable development agenda.

#### SUMMARY

This project addressed the question: can physics be made more attractive to potential students by engagement with the sustainable development (SD) agenda? This participative action research project comprised: an attitude survey amongst potential physics degree applicants concerning the role of physics in SD; coordination of development of materials highlighting the relevance of physics to SD and relevant process training in collaboration with partners; trials, evaluations and modifications of undergraduate materials; formation of an outreach activity utilising physics in SD materials; dissemination of resulting 'open' materials and processes; and materials evaluation utilising degree entrant focus groups and research program evaluation.

#### RATIONALE

Following the seminal Dearing report in 1997 concerning the state of UK Higher Education, the Institute of Physics (IoP) published their own analysis of the position of Physics in 2001. According to this publication, physics education seemed to be facing a crisis of faith among both educators and students alike. Due to the various conditions for school-based teachers in particular and the attractions of other careers, physics had somehow lost its position in the newly competitive forum of educational practice. Amongst a long list of IoP recommendations is the "case for a New Degree drawing heavily upon Physics –

being more interdisciplinary in focus and accessible by undergraduates with more modest mathematical experience". Furthermore, typical of the Dearing vision, yet reoriented along the lines of physics, this New Degree would demonstrate "encouragement of a breadth of thinking and support for a multi-disciplinary approach to problems". Moreover, the IoP also highlighted the need to 'open up' admissions and further encourage people from a wider variety of backgrounds into all levels of physics education. The approach widely adopted for this challenge is to seek new ways of emphasising the relevance of the traditional physics curriculum or its close relatives. Alternatives include proposals for re-arranging the traditional curriculum along themes. Thus, the aim of this research was to highlight a role for physics that is not usually emphasised and may appeal to students with a more forward-looking view for a *sustainable* world. This role is not highly developed although it formed the basis of a "World Conference on Physics and Sustainable Development" in 2005 ([www.wcpsd.org](http://www.wcpsd.org)).

#### THE APPROACH

This participative action research project comprised: an attitude survey amongst potential physics degree applicants concerning the role of physics in SD; coordination of development of materials highlighting the relevance of physics to SD and relevant process training in collaboration with partners; trials, evaluations and modifications of undergraduate materials; formation of an outreach activity utilising physics in SD materials; dissemination of resulting 'open' materials and processes; and materials evaluation utilising degree entrant focus groups and research program evaluation.

#### THE OUTCOMES

To answer the research question posed: yes, it appears that the outreach activity did attract students to physics. The information received from the school visits was, to some extent, validated during the Higher Education Academy's conference "Sustainability and the Curriculum: Progress and Potential" (University of Bradford, 10-11 July, 2007) where amended versions of the games were presented as part of the project's overall presentation. Several of those who attended expressed interest in the games' potential for application in other areas of education and further suggestions for their modification arose from the interesting discussions that took place. Given more time and greater cross-discipline collaboration, these designs could certainly be expanded on and improved in many ways, but the experience, in the very least, shows how learning materials of this type can successfully stimulate people to think about, and engage in, issues as diverse and complex as sustainability.

Overall, this current manifestation of the CLASS method used, including the game competition, can be deemed a success in that it engages more mature learners in thinking about issues concerning sustainable development. Some of the student participants are indeed extremely motivated to work towards sustainability solutions in future years. Of course, they may already have had this

degree of motivation but without a baseline test, which was not taken in this project, this will remain unknown.

#### TAKING IT FURTHER: LESSONS AND SUGGESTIONS

- As stated above, lecturers of many disciplines who were introduced to amended versions of the games expressed interest in the games' potential for application in other areas of education and further suggestions for their modification arose from the interesting discussions that took place.
- There was some variance in the degree of this success which may indicate that the outcomes were themselves not sustainable for some of the participants; that is, the project objectives may not persist beyond the lifetime of the competition. Since sustainability of ESD is of paramount concern amongst ESD educators (due to the longitudinal aspects of forthcoming necessary interventions, i.e., sustainable development solutions will need to be maintained for many years to come) this is a serious concern.
- The real proof of the thesis central to this project – that such approaches can be re-contextualised – will come when the materials, methods and results are disseminated for people to employ in contexts other than the one in which these ideas have latterly been developed. For example, can similar games be co-developed, for instance in Rwanda, which reflect the true sustainable development issues which Rwandans are currently facing? And why stop at Rwanda, what about Sudan and Tanzania? That is, this *essential* 'glocalisation' of ESD will be this project's acid test.

#### FURTHER INFORMATION

The complete final report:

[https://swww2.le.ac.uk/projects/cetls/JETL/JETL\\_members/Papers/TBPaper/view](https://swww2.le.ac.uk/projects/cetls/JETL/JETL_members/Papers/TBPaper/view)

Resources related to this project: <http://www.timbarker.org/s4s/>

Dearing Report of 1997: <http://www.leeds.ac.uk/educol/ncihe/>

Institute of Physics Report of 2001:

[http://www.iop.org/activity/policy/Projects/Archive/file\\_6418.pdf](http://www.iop.org/activity/policy/Projects/Archive/file_6418.pdf) (PDF 444KB)

World Conference on Physics and Sustainable Development 2005:

<http://www.wcpsd.org/>