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Development of a student resource for problem-based learning in Ecological Economics informed by student experience and reflection

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Project Reference Number:	173
Title:	Development of a student resource for problem-based learning in Ecological Economics informed by student experience and reflection
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Description:	<p>Background to project (or context)</p> <p>Ecological Economics is concerned with linking human behaviour to the environment via the economy. An Ecological Economist aims to solve real life problems such as traffic congestion, excessive emissions levels and unsustainable consumption levels. This fellowship was needed in order to fill the gap in resources available to students by giving them active role in the creation of a resource to aid problem based learning (PBL) in the field of Ecological Economics.</p> <p>Aim and objectives of project</p> <p>Aim</p> <p>To develop a student resource to improve the learning and teaching experience for problem-based learning in Ecological Economics.</p> <p>Key objectives:</p> <ul style="list-style-type: none"> ○ To use student experience and reflection to inform the development of problem based learning (PBL) in Ecological Economics; ○ To enhance the student experience by encouraging deep rather than surface learning. Students will become more flexible, self-reliant and innovative in practice and develop a deeper understanding of how to achieve sustainability through tackling local ecological economic problems firsthand; ○ To employ appropriate technology where possible to increase efficiency and enhance the teaching and learning experience (Technology Enhanced Learning); ○ To develop an innovative, digitally available student resource to guide students through solving Ecological Economics problems using appropriate local case study themes;

- To embed aspects of the CETL Centre for Sustainable Futures Education for Sustainability agenda.

Methods used

A large cohort of Environmental Science students (c. 150) worked in groups on one of four themed problems: waste, emissions, transport and food. They produced: reports on the PBL process and their proposed solution strategy; a Pecha Kuchaa style presentation; and a feedback questionnaire with recommendations for improvements to the PBL process and the use of Google Docs as a collaborative tool. Qualitative data from the questionnaire were analysed using Nvivo8 eliciting key positive and negative experiences. Quantitative data from the questionnaire were analysed using Excel to determine the strength of opinion on different aspects of the PBL process and experience.

Results

The project has resulted in a considerable contribution to the knowledge base of PBL in Ecological Economics. Problem based learning offers an exciting approach for teaching and learning however there are key considerations which should be made before implementing it. Key findings from student feedback questionnaires were:

- The timing of using PBL is crucial. It would be better to introduce PBL in the first or second year of a degree when students are less time pressured and group marks do not have so much bearing on the final degree grade.
- Large cohort size can hinder progress. If timetabling allows, groups should be split by problem theme, offered sufficient tutorial slots and one to one time with the facilitator. If possible more staff should be brought in.
- Collaborative writing tools can be a useful aid to group work activities such as PBL but Google Docs may not be the best tool for all students. Other tools should be explored such as Dropbox©, Adobe Buzzword and even Facebook.
- Practitioners should be involved. Students are likely to feel more engaged with their problem theme if their topic is introduced by an external speaker working in the field.

The fellowship outputs will be used to improve the PBL experience for future students of Ecological Economics and provide a “lessons learnt” perspective to potential PBL facilitators.

Outputs

	<p>Five main outputs from the fellowship are:</p> <ul style="list-style-type: none"> ○ A digital resource for students on PBL in Ecological Economics – almost ready to go live in November. This is based on student feedback this year. This will be refined each year and additional case study problems added. Some of the best examples of student work were used in the handbook. ○ A paper on the role Google Docs as a collaborative tool has been submitted to AJET. ○ A journal article on Problem Based Learning with large cohorts is in preparation. The results of this are complete and the final version will be submitted in December 2011. ○ A poster presentation for the UoP VC conference in teaching and Learning 2011. ○ The findings from the questionnaire along with student Pecha Kucha slides were presented at an International Conference in July 2011 (Education in a Changing Environment), University of Salford. ○ An Ecological Economics blog for communication flow – up and running. Though will be linked much more to the lectures next year to encourage further exploration of the topic with all students beyond the lecture room.
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Web Site:	Discovering Ecological Economics Blog: http://discoveringecolecon.blogspot.com/
Collaborators:	
Keywords:	large cohorts; online collaboration; group work; learning resources; online resources; problem-based learning;
Publications:	<p>Rodwell, L.D. (2011): Google Docs as a collaborative writing tool: a help or a hindrance? Submitted to Australasian Journal of Educational Technology.</p> <p>Rodwell. L.D. and Hunter, C. (in prep): Implementing problem based learning with large student cohorts. Target journal: The Interdisciplinary Journal of Problem-based Learning.</p> <p>Rodwell. L.D. and Hunter, C. (2011) Problem based learning in Ecological Economics – lessons from the student experience. Poster presented at The VC conference in teaching and learning, University of Plymouth.</p> <p>Rodwell. L.D. and Hunter, C. (in prep): Problem based learning in Ecological Economics – a student handbook. (Available online from November 2011)</p>

