

# **A novel example of cross discipline education for sustainable development in higher education in UK: Gender differences**

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## **1. Introduction**

The term Sustainable Development was first introduced in 1987 by Gro Brundtland in the document produced by the Brundtland Commission of the United Nations. The most widely used and traditionally accepted definition is "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs." However it was later defined as "Improving the quality of life while living within the Earth's carrying capacities" by the World Conservation Union of the United Nations Environment Programme in 1991. As such it is conceived as an abstract term not easily understood by many people. As Kofi Annan as UN Secretary General stated in 2001 "Our biggest challenge in this new century is to take an idea that seems abstract – sustainable development – and turn it into a reality for all the world's people". This is now highlighted in the UN Decade of Education for Sustainable Development (2005-2015). This is a massive task but must be tackled at many different levels in many different ways. The Higher Education Funding Council of England (HEFCE) has made it a driver for institutions in England for funding (2009). The Higher Education Academy is also seeking to produce "Sustainability literate" students (2006).

## **2. Embedding Sustainable Development in the Curriculum**

This paper describes a pilot study in which two examples of embedding the term Sustainable Development in the curriculum at both university and departmental level were examined. Both these initiatives involved level 5 or year 2 students. University staff from across all disciplines were also involved.

In 2001 following an occurrence of foot and mouth in the UK which prohibited students at the University of Chester from undertaking extensive fieldwork, alternative methods were sought and an Environmental Task Force was set up which included research within its remit. Later a PhD student (Lipscombe) was selected in 2006, to look at the impact of both curriculum and outreach ways of teaching about Sustainable Education across universities and to make it more understandable. As such, Sustainable Development is now included in the university's Learning and Teaching strategy (2008/9 – 2012/13), '*Enhancing the student learning experience*', at Section 4:

- *sustainable development*, and the importance to Chester graduates of skills and knowledge that contribute to society, economy and environment.

It also appears in Appendix 2 *Template for target setting in departmental strategies*:

- to develop staff expertise in the embedding of graduate employability and sustainable development in curriculum design and assessment strategies

The Biological Science department has embedded sustainable development in its own learning strategy action plan.

Lipscombe also evaluated the position of the concept both within and outside the curriculum in all education institutions across the UK. (Lipscombe 2008, 2009, Lipscombe et al., 2009) Part of the dissemination of the concept and outcomes of the research involved lecturing to 166 research methods students within the department of Biological Sciences. All (160) second year students (level 5) undertook this module. The areas covered in the discipline are shown in Table 1.

*Table 1 Programmes covered in University of Chester, Department of Biological Sciences*

Programmes and subject areas
Animal Behaviour and Animal Behaviour & Welfare
Zoo management
Forensic Biology
Public Health Nutrition
Human Nutrition
Dietetics
Biomedical Science
Biology
Combined with other subjects

## 2.1 Evaluation

In order to evaluate the effect of this method of widening understanding among students, a pilot study was conducted with a single module at the University of Chester. The small questionnaire was circulated before the first lecture and later during the revision period of the second year (level 5) research methods (BI5110) module (Fig.1). In order to evaluate a wider understanding across the university, the same questionnaire was circulated to a small selection of staff at the annual staff conference (2010). The questionnaire covered simple demographics (Gender, Programme of study and Age), followed by a question on the participant's understanding of the concept. The last part of the questionnaire simply asked for four words (concept phrases were also acceptable) which they thought described the term Sustainable Development.

An intervention was then introduced 12 weeks later. This one hour lecture to students covered the concept of sustainable development. After an initial discussion of both definitions of terms and the history of the idea, there were three main tenets discussed during the remaining time of lectures to students:

- the shift from see-saw to jigsaw debate
- the three pillars model and Russian doll links
- equity concepts (Table 2)

*Table 2 Temporal equity concepts*

<ul style="list-style-type: none"> <li>• In the present - intra generational equity</li> <li>• Into the future - inter generational equity</li> </ul>
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These concepts moved from a shallow understanding of the term i.e. environmental use of resources to a deeper understanding involving progress respecting environmental limits and equitable development. It was an increased depth of understanding of these concepts which we hoped would be picked up by the students in their word recall at the end of the module as well as a greater confidence in their application of the abstract term: Sustainable development.

The collected data was coded for analysis to ensure anonymity. The same questionnaire was distributed 12 weeks after the intervention at the end of the module to test for retention of understanding of the concept Sustainable Development. These results were also coded and analysed using the same criteria.

### **3. Results**

After coding, the collected data was subjected to analysis and the results are presented in the following histograms (Figs 2-4). Initial analysis of the self-assessed data showed that less than 1% of the students felt they were very familiar with the term Sustainable Development and 10% had never heard of it.

The data showed that there was a significant change in the overall understanding of the term with 29.5% of the cohort showing some level of understanding at the beginning of the module but 41.4% having an understanding by the end.

The greatest movement however was in the number of people moving to a deeper understanding of the concept. Scores were allocated to each person for their depth of understanding based on the words they used and their level of understanding as indicated above.

#### **3.1 Gender differences**

Data show that females have an initial general and deeper inherent understanding and awareness of the Sustainable development concept than males (Figs. 3, 4). Few significant differences were found due to the large error associated with the small number of males sampled, although trends are clear. Although the intervention increases deep understanding in both genders, it appears that females generally have a deeper understanding than males, but these differences reduce after intervention.

#### **3.2 University Staff**

Eight members of university staff took part in a small pilot study (50% male; 50% female). These were from different departments ranging from languages to geography & nursing. All showed a good understanding of the term and there was no difference of understanding between gender or age. All self assessed that they were either familiar or very familiar with the concept. Subsequent analysis confirmed that seven satisfied the criteria for a deep understanding of the term Sustainable Development.

#### **4. Recommendations for future research**

A greater time period should follow the intervention to establish the depth of persistence so that it can be determined whether there is a short term gain or a long term impact in maintaining the deeper understanding of the term 'Sustainable Development' in Higher Education students. The questionnaire analysis should also be extended to deal with other demographics such as age and educational background.

#### **5. Conclusions**

The results from this study show how important it is to educate students during the course of their university careers by intervention in the curriculum. It also highlights the differences in gender perception of the term sustainable development, with females having a greater initial and deeper understanding of the term. Understanding the significance of the term sustainable development is crucial to producing "Sustainable literate students". The development of the Sustainable Development Awareness tool helped to define this. During the UN decade for sustainable development, the students can spread the concept via the meme method of infecting other individuals with the idea. The fact that the small pilot project carried out on the staff showed a higher level of understanding of the concept perhaps is not surprising and bodes well for the future as does the greater student retention of deeper understanding of the term sustainable development.

Although it is not surprising that there is a change in understanding after an intervention, it is interesting that there was a change in depth of understanding and these differences are gender specific.

This pilot study has highlighted apparent gender differences which need to be further analysed using a larger sample size and a more equitable gender distribution.

**Figures**

- Figure 1 What is Sustainable Development? questionnaire
- Figure 2 Comparison of university student sustainable development understanding
- Figure 3 Gender differences in understanding: Females
- Figure 4 Gender differences in understanding: Males

*Figure 1 What is Sustainable development questionnaire*

**What is Sustainable development?**

- Male/Female (Please circle)      Programme of study.....
  
- Age (Please circle) <21   21-<40   40-<65   >65

Understanding of concept (Please tick)

- Very Familiar
- Familiar
- Heard of but could not explain
- Never heard of

4 Key words to describe the your perception of Sustainable Development

- 1
- 2
- 3
- 4

Figure 2 Comparison of university student sustainable development understanding

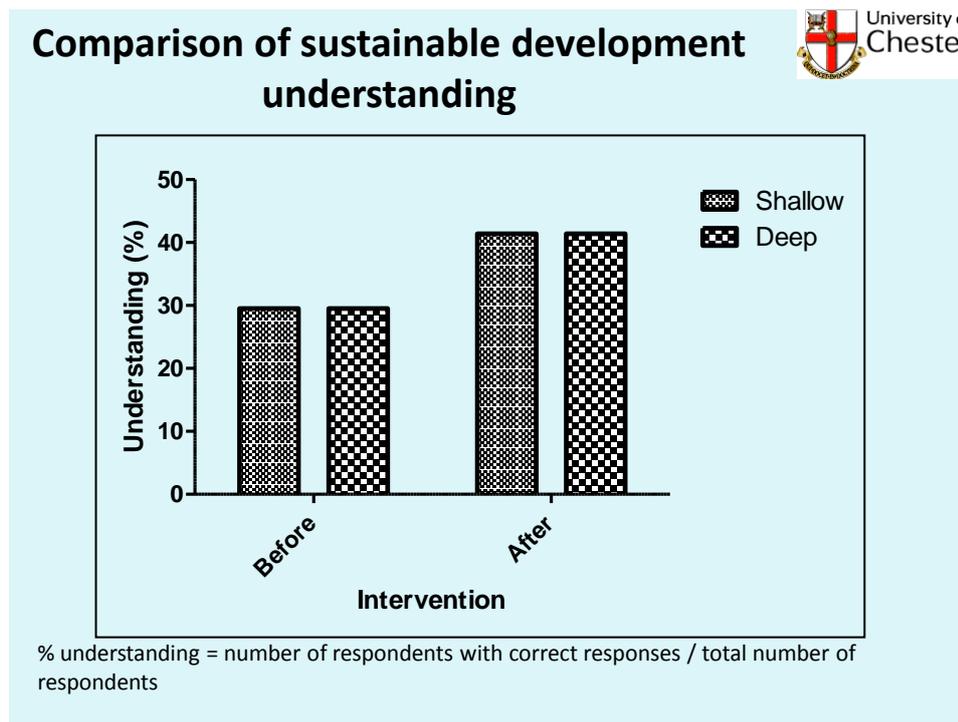


Figure 3 Gender differences in understanding: Females

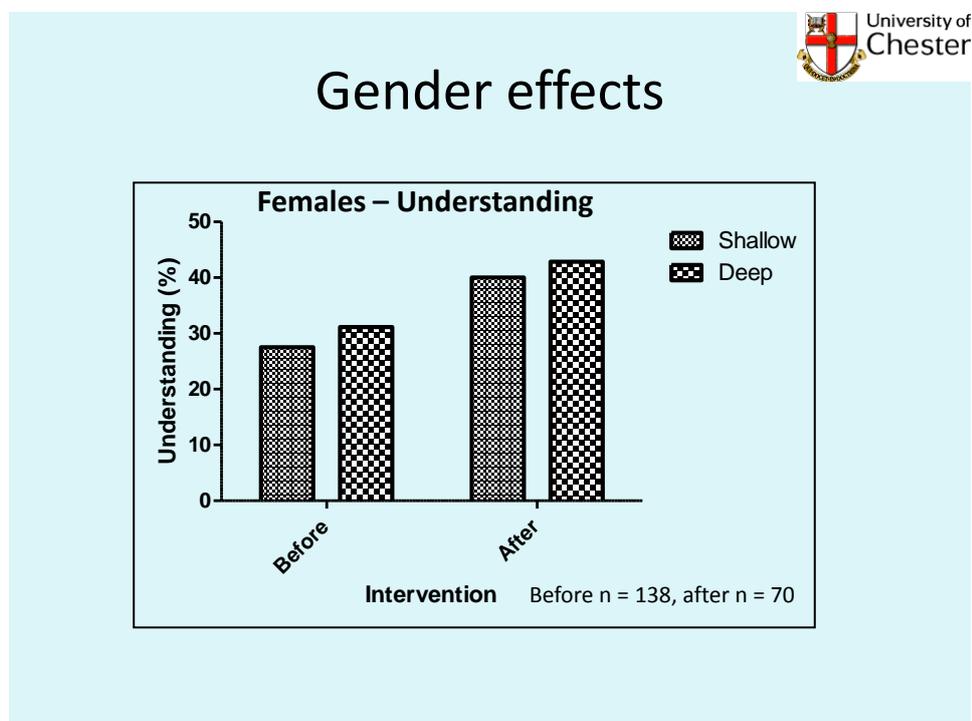
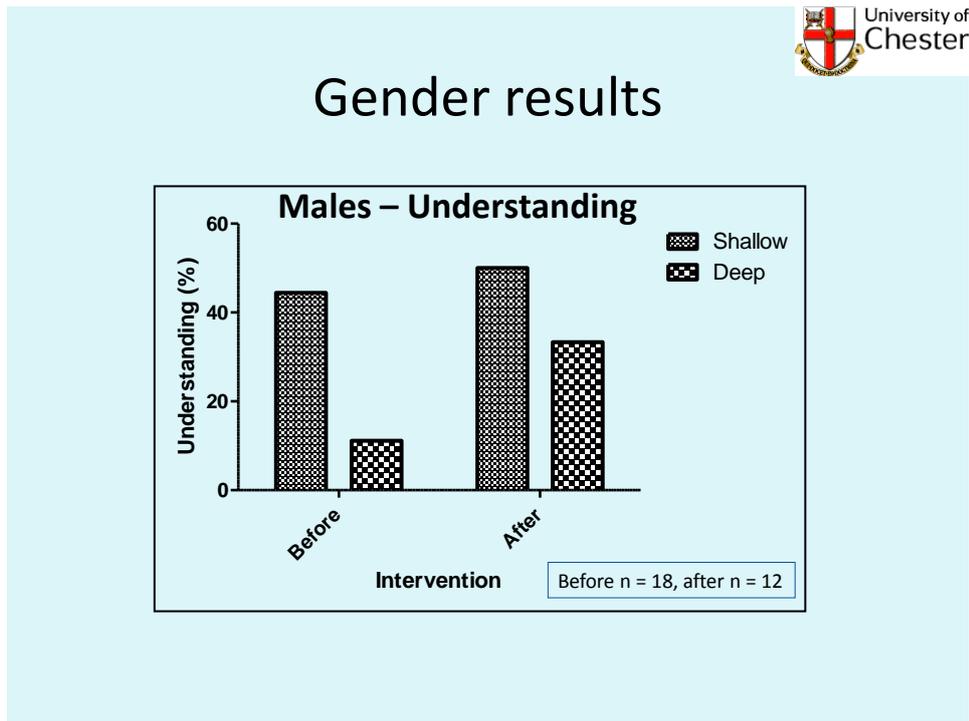


Figure 4 Gender differences in understanding: Males



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