

**The impact of University policies for sustainable development on students: a comparison of students from two institutions, one in the UK and one in Portugal**

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**ACKNOWLEDGEMENTS**

NECE - R&D Centre funded by the Multiannual Funding Programme of R&D Centres of FCT (Portuguese Foundation for Science and Technology), Ministry of Science, Technology and Higher Education.

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**Keywords** Sustainable development, Education for sustainable development, holistic approaches, environmental attitudes

## **Abstract**

If we are to achieve sustainable development and secure targets for carbon reduction then universities have a role to play in educating students to address sustainable development (SD) and influencing behaviour change. Some universities have already developed approaches to address SD within the curriculum, on campus and in the community; others have done far less, or very little. The assumption might be that students from a university which is formally addressing SD, should exhibit different attitudes and behaviours to students from a university where SD is not a concern. This paper will compare the environmental consciousness level and “green” behaviour of students from a university in Portugal which has no formal sustainable policies, nor a structure supporting the development of global citizenship, with a University in the UK where a formal policy has been implemented which embraces a holistic approach to SD and global citizenship. Analysis of survey data from the two student populations reveals significant differences in environmental attitudes, with students from the UK University displaying greater concern about the environment, greater belief that their actions can influence change and more concern with

conservation and buying locally sourced food. The Portuguese students are more concerned about future generations. The conclusion suggests that formal policies do have an impact however the cultural context must also be considered.

## INTRODUCTION

The role of universities in securing a more sustainable future and contributing to targets for carbon reduction is undoubted; they have a critical role to play as agents of change (McMillan and Dyball, 2009; Marans and Edelstein, 2010; Cortese, 2005) particularly where they adopt an integrative approach to SD which embraces curriculum, campus, community and research. However while it may seem perfectly obvious (at least to advocates of SD) that higher education bears '*a profound moral responsibility to increase the awareness, knowledge, skills and values needed to create a sustainable future*' (Cortese, 2005, p. 17), evidence of holistic approaches to sustainability is patchy. Few universities have successfully embedded education for sustainable development across the entire curriculum; too many universities continue to advance '*the kind of thinking, teaching and research that leads to unsustainability*' (Wals and Blewitt, 2010, p. 70). There are however changes afoot: the place of sustainability is '*slowly shifting from one of campus greening and curriculum integration to one of innovation and systemic change in the whole university system*'. However as Sterling and Scott (2008) comment, environmental management (led by environmental managers) has made far greater progress in the UK because of legislation and financial incentives; curriculum change continues to be a much tougher challenge. A similar situation is evident in Australia (Jones et al., 2010) and North America; progress in Europe is seen as '*variable but rarely spectacular*' (Wals and Blewitt, 2010, p. 60). In Canada, there is similar variability with some universities opting into campus climate initiatives which include renewable energy production, reducing greenhouse gas emissions, behaviour changes, and institutional involvement (Helferty and Clarke, 2009).

It is hardly surprising that most writers on SD continue to bemoan a lack of progress, while emphasising the transformation needed within higher education, and the potential of education, to lead to the type of transformational learning which might address sustainable development. The underlying assumption (although rarely explicit) is the power of education for sustainable development (ESD) to develop a generation who will tackle un-sustainability and who will presumably be equipped to work towards a more just and sustainable future. Such graduates will naturally need to be quite different to those who have been through the education system previously. As Helferty and Clarke (2009) suggest, this target group (students) is really important specifically in regard to the environmental facet of SD since youth feel some affinity to the environmental movement and already consider problems environmental as something that is important.

Despite a substantial literature on sustainability, there is a lack of empirical work which focuses on the difference it (ESD) makes to students. A number of questions merit consideration, for example, if a university adopts a strategic approach to sustainability which embraces the curriculum, what is the real impact on students? Will they have different attitudes and behaviours, for example, to students who have studied at a University which has not taken up the sustainability challenge? It is easy to espouse ideology (in terms of what higher education should be doing in relation to SD) but where is the evidence to suggest that enactment of this ideology has such a powerful influence on learning outcomes? Such questions suggest a need for both comparative and longitudinal studies which seek to understand the impact of ESD on students; such studies will no doubt emerge in the fullness of time as more universities seek to develop sustainability literate graduates. However, as a tentative start, this paper offers an exploratory study which sought to compare students from

two institutional contexts: University A in England and University B in Portugal. University A has undertaken considerable work to progress sustainable development in a holistic way; University B has no formal approach and has achieved far less. As the problem is complex and SD is a multidimensional concept, in this specific research the focus of the analysis will be largely on environmental issues.

The institutional contexts of Universities A and B will be presented briefly, followed by the details of a questionnaire that was undertaken to explore whether the English students differed in their responses, to those from Portugal. Discussion will then attempt to draw conclusions and suggest areas for further research.

## **EDUCATIONAL AND INSTITUTIONAL CONTEXTS**

Within the UK, the government identifies education as a major vehicle for securing sustainable development (DEFRA, 2005; DfES, 2006). The Higher Education Funding Council for England (HEFCE) with a clear vision and strategy for higher education (HEFCE, 2005; HEFCE, 2008) has been instrumental in urging universities to engage with sustainability. The Funding Council emphasises the importance of education for sustainable development but has however, steered away from making it compulsory. As a result, substantial progress has been made by some institutions but progress across the sector, is 'disparate'. It continues to be the case that, *'the higher education sector is one of the hardest sectors in which to institutionalize sustainability'* (Junket and de Ciurana, 2008, p. 764). While very few English universities have adopted a holistic approach to sustainability, most have made strides forward in environmental management and carbon reduction strategies

to meet legislation and financial incentives. The emergence of 'League Tables' and benchmarking exercises which assess 'green credentials' has also triggered change.

University A is an example of an English institution which has attempted to adopt a holistic and strategic approach to the agenda which embraces campus, curriculum and community (Shiel, 2007). In its ambition to develop global perspectives across the university, substantial work has been undertaken to ensure that the curriculum seeks to cultivate global citizens who understand the need for sustainable development. Strategy is in place and 'Curriculum Guidelines' were developed in 2005, and revised in 2008. These guidelines require all Course Teams to address sustainable development at Course Design and in Course Review. In essence it is suggested that the curriculum will (among other things):

- enable students to understand the links between their own lives and those of people throughout the world;
- increase understanding of economic, social and political forces which shape life;
- develop skills, attitudes and values to enable people working together to bring about change for the 'common good' and to take control of their own lives;
- provide the learner with the knowledge and skills to work towards a more just and sustainable world where power and resources are more equitably shared.

Student surveys reveal that substantial progress has been made at University A over five years; students have a better understanding of SD and global citizenship. External indicators of success also confirm that the institution has also made great progress in terms of its campus and environmental management. The University is one of only six universities in the UK to have achieved 'gold (standard), or above' in

the Eco-Campus Award. It has also achieved other national awards such as 'Green Gowns,' and is fairly high (although not at the top) of the 'Green League Table'. The University has been a 'Fairtrade' University for a number of years, engages with partners in the region to progress sustainable development and is committed to social responsibility.

In Portugal discussion around the role of Universities in relation to sustainable development has been almost non-existent, and the few events which have been organised have been limited to an environmental perspective. This lack of engagement is illustrated by a situation where before 2005, just one institution (the University Nova of Lisboa), had signed up to the Talloires Declaration. Since then although some Portuguese universities have been taking forward sustainability initiatives (e.g. University of Algarve, Aveiro, Porto, Nova of Lisboa, Técnica of Lisboa), there is a gap in terms of coordination and communication at the national level, which could have detrimental consequences (Couto et al., 2005). In this sense, the creation of an organisation, or body to coordinate issues in relation to sustainable development within higher education, is crucial but not evident in Portugal.

An explanation of why there is less higher education activity in relation to sustainability in Portugal is because Portugal has been 'behind the game'. The OCDE Report "Good Practices in the National Sustainable Development Strategies of OECD Countries" highlights that of the 30 OCDE countries, 23 of them had prepared formal plans in the field of national sustainable development strategies; some (Australia, United Kingdom, France, Japan, Finland, Luxemburg, Holland, Sweden and Switzerland, United Kingdom) formulated strategies very early and had

already revised those strategies. Other countries (including Portugal) had prepared their strategies more recently (OCDE, 2006).

The themes of the Portuguese National Sustainable Development Strategy are detailed in a set of documents approved by the Government. One of the four principles of the strategy *“is to progress towards a society of solidarity and knowledge, including through interventions to strengthen the citizen components of education and greater access to information and participation in decision-making”* (OCDE, 2006).

In the education sector, the adoption of a National Strategy for Development Education presents a great challenge for the country. The main intention of this plan is to strengthen the inter-institutional cooperation mechanisms between educational agents; develop tools to promote global citizenship by means of learning processes and; raise consciousness of development related aspects in Portuguese society. Although the idea of this national strategy is to promote development education at all levels of education, learning and training, the reality is that its implementation in higher education is still very incipient. Thus, the involvement of higher education in the area of education for citizenship and development education remains to be enforced. In the pre-school, basic and secondary level investment in education for citizenship has been progressed. However, there is a long way to go to overcome obstacles, which include: the frequent non consideration of development education in the context of education for citizenship, especially in the training of professionals; the lack of pedagogical materials to support the learning; the financial constraints; and the difficulties that teachers have in working as an interdisciplinary team (IPAD, 2009).

In order to gain a better picture of the situation in Portugal, Schmidt et al. (2011) examined the results of a questionnaire sent to 15.000 public and private schools (kindergarten and first cycle of basic education; second and third cycles of basic education; and third cycle and secondary education) involved in projects associated with both environmental education and education for SD. The authors concluded that environmental education and education for SD are internally focused, rarely involve the community, and projects which involve the whole scholarly community, are difficult to find.

The projects tend to emphasise ecological issues rather than broader engagement: *“This means there is too much environmental education and not enough education for sustainable development in the schools of Portugal”* (Schmidt et al. 2011, p. 174).

The projects also give preference to younger students instead of post-adolescent or pre-adult students. The biggest problem Schmidt et al. (2011) identified was the short term nature of the projects and lack of continuity. Given the national context, when students arrive at university, it is unlikely that they will have had the same exposure to sustainable development as UK students. It is within this context that University B operates.

University B has been in existence since 1986. One of the most interesting physical features of this university is that its estate comprises old buildings with historical, cultural and architectural value, which have been repaired and conserved. At the same time that these historical landmarks have been re-constructed, they have been revitalized into teaching and investigation spaces. In this way the institution has been promoting both sustainable construction and building conservation. However the University has no formal policy or strategy in place for sustainable development. It

has made some effort related to energy, water saving and recycling but not as part of an overarching strategic approach. In relation to the curriculum, there is no drive to incorporate sustainable development into formal education. There are a few post graduate courses that partially address sustainability but beyond that, education for sustainable development is not being considered across disciplines.

## **RESEARCH METHODOLOGY**

Given the different approaches to sustainable development at Universities A and B the assumption might be that students from A (a university which is formally addressing sustainable development) should exhibit different attitudes and behaviours than the students from B (a university where sustainable development is much less of a concern). The question which this paper seeks to address is thus:

- Do the students from a university which has a formal approach to sustainable development respond differently to those from an institution which has not adopted this approach, when asked questions related to sustainability?

In seeking to address this question which has been largely unexplored, data was used from a survey/questionnaire, which had already been designed and implemented for a wider study. As part of the wider study there was already a data set, which allowed English students to be compared to Portuguese. The original questionnaire sought to test a model to consider the relationship between green attitudes and values and behaviour, in relation to green consumer behaviour. The data collected as part of the earlier wider study yielded the opportunity to test

whether the existence, or non existence, of SD policies in a University, do influence the environmental attitudes and behaviours of students

As part of the wider survey study a questionnaire was designed, piloted and then adapted, to enable data to be collected from various countries. The survey took the form of a self-administered questionnaire which was made available on line. As University A has a considerable number of International students, when the survey was released, only UK students were invited to respond.

The questionnaire was designed to include several scales to enable information to be gathered about values (Man Nature Orientation and Loyola Generativity Scale), attitudes (New Environmental Paradigm and Perceived Consumer Effectiveness) and behaviours (ENVIROCON and Ecologically Conscious Consumer Behaviour). Additionally, two questions were included about fair trade and locally sourced goods, all measured on a seven point scale. Finally some questions to gather demographic information (age, gender, nationality, course and year of frequency) were included.

The scales make reference to five dimensions or constructs:

- Man Nature Orientation (MNO): states that people should behave according to the way of nature and respect the world where they live in (Chan, 2001);
- Generativity (GE): the concept is related to the belief that an individual regards the future as important, and as such there is an obligation to secure it for future generations (Urien and Kilbourne, 2011);
- Environmental Concern (EC): includes concerns related to the limits to growth, pollution, steady-state economy and resources conservation (Dunlap and Van Liere, 1978);

- Perceived Consumer Effectiveness (PCE): is based on the idea that peoples' responses to environmental appeals are linked to the belief that they can positively influence and contribute to solve environmental problems (Ellen, Wiener and Cobb-Walgren, 1991);
- Conservative Behaviour (CB): is related to conservation activity - dispositional actions, recycling, preservation of resources, etc. (Pickett, Kangun and Grove, 1995);
- Buying Behaviour (BB): covers topics such as purchasing green products, the attention given to packaging, energy-efficient equipment, polluting or recycled products (Straughan and Roberts, 1999).

Data was collected over a six week period in 2010. The final sample includes 612 respondents: 301 university students from Portugal and 312 from the UK.

After collection, the data was statistically analysed and interpreted using the statistical software SPSS version 20.0.0. Descriptive analysis, t-tests and discriminant analysis were used.

## **RESULTS PRESENTATION AND DISCUSSION**

The sample from the UK has a median age of 25 years (mode 18; standard deviation 8,981; minimum 18; maximum 56); 28% are male; many of the respondents are studying Health sciences (21,8%), Miscellaneous (17,3%) and Business and economics (15,4%); 42,0% is attending the 1<sup>st</sup> year in the university, 26,9% the 2<sup>nd</sup> and 16,7% the 3<sup>rd</sup>, principally at the undergraduate level (87,5%).

In turn, the Portuguese sample has a median age of 22 years (mode 20; standard deviation 4,731; minimum 17; maximum 50); 50% are male; mostly study Business and economics (29,6%), Sports (16,9%) and Engineering (16,6%); 28,9% is attending the 1<sup>st</sup> year in the university, 38,2% the 2<sup>nd</sup> and 30,2% the 3<sup>rd</sup>, principally at the undergraduate level (85,7%).

Table 1 shows the descriptive statistics for both samples regarding the variables, related to environmental issues, included in the study.

**Table 1.** Descriptive analysis

<b>Variables</b>	<b>Nationality</b>	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>
Man nature orientation (MNO)	Portuguese	301	4.8600	1.07877
	English	312	5.7064	0.99320
Generativity (GE)	Portuguese	301	4.8403	0.93213
	English	312	4.6391	0.97711
Environmental concern (EC)	Portuguese	301	4.7763	0.87140
	English	312	5.4874	0.87661
Perceived consumer effectiveness (PEC)	Portuguese	301	4.2113	1.03403
	English	312	5.4127	1.13825
Conservative behaviour (CB)	Portuguese	301	4.4233	0.96591
	English	312	5.3114	0.93891
Buying behaviour (BB)	Portuguese	301	4.1300	1.13177
	English	312	4.6167	1.35145
Buying fair-trade products (BFP)	Portuguese	301	4.53	1.515
	English	312	4.59	1.703
Buying locally sourced food (BLS)	Portuguese	301	4.43	1.645
	English	312	4.73	1.621

Regarding the table above we notice similar means in some factors (e.g. GE, BB, BFP, BLC) but some accentuated discrepancies in MNO, PEC and CB, with all these having higher mean values in the English sample. But in relation to data dispersion, higher dispersion values can be observed in PEC, BB, BFP and BLC. In general the

standard deviation statistic value is higher in the UK sample, which indicates more dispersion of the data in this case.

The next step was to test for statistically significant differences between the two samples. Table 2 presents the results of that test for the variables included in the study.

**Table 2.** Independent samples test

Variables	Levene's Test for Equality of Variances		t-test for Equality of Means			
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
Man nature orientation (MNO)	4.355	0.037	-10.111	611	0.000	-0.84642
Generativity (GE)	1.941	0.164	2.606	611	0.009	0.20116
Environmental concern (EC)	0.479	0.489	-10.071	611	0.000	-0.71116
Perceived consumer effectiveness (PCE)	2.148	0.143	-13.664	611	0.000	-1.20141
Conservative behaviour (CB)	0.204	0.652	-11.543	611	0.000	-0.88806
Buying behaviour (BB)	9.569	0.002	-4.825	611	0.000	-0.48669
Buying fair-trade products (BFP)	4.577	0.033	-0.472	611	0.637	-0.062
Buying locally sourced food (BLS)	0.333	0.564	-2.290	611	0.022	-0.302

Considering a confidence level of 95%, MNO, BB and BFP show differences in the variances of the two groups of students. All constructs, except BFP which is not

significant, show a different mean between UK and Portuguese students, that is, there are significant differences in the students regarding GE, EC, PCE CB and BLS (note that MNO, BB and BFP do not verify the condition of the homogeneity in the variances and by this they do not need to be taken into account in the t test).

To complement the analysis, in order to discover which variables were more significant to differentiate/distinguish the two groups of students, a discriminant analysis was carried out (Table 3). By observing the results of F statistics all the variables, when considered individually, are significant for differentiating between the groups, except BFP ( $p= 0.637$ ). The Wilks' lambda test statistic suggests that the variable PCE is the one that provides the greatest difference between the means of the two groups of students, since it presents the lowest score. After this and in descending order of their discriminatory power come the variables CB, MNO, EC, BB, GE and BLS.

**Table 3.** Tests of Equality of Group Means

Variables	Wilks' Lambda	F	df1	df2	Sig.
Man nature orientation (MNO)	0.857	102.241	1	611	0.000
Generativity (GE)	0.989	6.793	1	611	0.009
Environmental concern (EC)	0.858	101.419	1	611	0.000
Perceived consumer effectiveness (PCE)	0.766	186.691	1	611	0.000
Conservative behaviour (CB)	0.821	133.239	1	611	0.000
Buying behaviour (BB)	0.963	23.283	1	611	0.000
Buying fair-trade products (BFP)	1.000	0.223	1	611	0.637
Buying locally sourced food (BLS)	0.991	5.244	1	611	0.022

The discriminant analysis that was undertaken made it possible to find one discriminant function (Table 4). The differences between the groups may be analysed on the basis of the loadings of this function.

**Table 4.** Canonical discriminant function

Functions	Eigenvalue	Canonical correlation	Wilks' lambda	Chi-square	df	Sig.
1	0.605	0.614	0.623	287.224	8	0.000

As can be seen in the Table 4, referring to the canonical discriminant function, estimated on the mean of the groups (centroid), by squaring the canonical correlation coefficient, the percentage of variance explained by the function is 38%. The statistical significance of the function is represented by the value of the Wilks' lambda test statistic, which, when transformed into a Chi-square, has a significance level of 0.000. This shows that the function is significant for discriminating between the two groups of students.

In view of the statistical significance observed between the groups, it is useful to examine the individual contribution of the variables to the discriminant function, which can be observed in Table 5.

**Table 5. Structure matrix**

<b>Variables</b>	<b>Function</b>
Perceived consumer effectiveness (PCE)	0.711
Conservative behaviour (CB)	0.600
Man nature orientation (MNO)	0.526
Environmental concern (EC)	0.524
Buying Behaviour (BB)	0.251
Generativity (GE)	-0.136
Buying locally sourced food (BLS)	0.119
Buying fair-trade products (BFT)	0.025

Note: largest absolute correlation between each variable and the discriminant function

Thus, the highest correlations can be observed in the first four constructs (PCE, CB, MNO and EC). In contrast, BLS and BFT present the lowest scores in terms of correlation with the discriminant function.

In synthesis, the results show that the students from University A and the students from University B do exhibit significant differences in their responses to the questionnaire in the following dimensions: Generativity, Environmental Concern, Perceived Consumer Effectiveness, Conservative Behaviour, and Buying Locally Sourced Food. The means founded are superior in all dimensions for the English sample, except in the case of Generativity where a higher value is presented by the Portuguese students. A possible explanation could be that within some sectors of Portuguese society, there has been and continues to be, a traditional concern with the heritage that will be left to their sons. However the results were surprising, as the English students should have been exposed to the concept of 'future generations' as an aspect of SD. Again cultural explanations might explain the difference and the

impact of a societal trend (in the UK) to 'have it all now' rather than defer gratification.

Perceived Consumer Effectiveness is the variable that presents the greatest difference between the English and the Portuguese students, that is, the former feel more strongly that their actions will have an impact on the environment, and that they will make a difference. It seems that while they may be less concerned about future generations, they do believe that their actions will contribute to protecting the environment.

The overall higher means (generally) and specifically in relation to consumer decisions might be taken as the fruit of the effort made by University A in terms of its SD policy. The inference might be that the message has been passed on to students. However while the results are interesting in the substantial differences they reveal, it is not possible to suggest that raising the profile of SD through a strategic and holistic approach is the sole contributory factor.

A further anomaly which suggests a need for wider explanations related to the concept of Fair-trade; on this dimension, both groups of students exhibit similar responses. This was a curious result because fair trade has not been extensively promoted in Portugal. Indeed, it is the norm that finding Fair-trade products outside of the big centres is very difficult. It has however been extensively promoted in the UK, and particularly at University A. A possible explanation might be that some of the Portuguese respondents did not really know the meaning of 'fair trade', or confused it with another concept.

## CONCLUSIONS

This paper has sought to consider whether students from a University which has made considerable efforts to embed sustainable development through a formal approach, respond differently when asked questions which relate to sustainability issues, to students from a university that has done far less. Data has been used from a wider study to make this comparison. This naturally places some limitations on the results, as the wider study was designed to test a particular model, rather than to explicitly look for difference in this way. It is also necessary to underline that this study focused only on a single aspect of SD (the environmental one) and that a further limitation is that although the samples are of a fairly equal size they are not an exact match, in terms of age, gender, course studied. Such limitations suggest a need for caution however, the results do suggest that differences are apparent and some are significant.

The study highlights that there are significant differences between the two student populations on five dimensions. In summary, the students from University A, where there is a formal approach to sustainability, demonstrate greater concern with environmental issues (Environmental Concern); are more likely to believe that their actions can positively influence and solve environmental problems (Perceived Consumer Effectiveness); are more likely to engage in behaviours related with the conservation of resources (Conservative Behaviour); and to buy locally sourced food. The students from Portugal however place greater importance on their obligation to consider the needs of future generations (Generativity).

The results could be taken as evidence that embedding sustainable development within a university does make a difference. Unfortunately it is not possible to draw

such a conclusion: the data may simply evidence differences due to nationality and cultural factors, rather than strategy and intervention. This research has not explored the extent to which students' attitudes and behaviour are influenced by the wider social/cultural/political context and media influences within their nation state.

Further studies are necessary to show that education for sustainable development makes a difference. In the future research might seek to explore differences before and after institutional interventions (within a single institution); between institutions (within a single country) and between institutions (within different countries). Important in these studies will be the ability to control variables which may influence the data. Longitudinal studies might also seek to show whether students' responses vary as they progress through their studies but also beyond the university into employment.

It is quite easy for an institution to show that it has reduced its utility bills, increased re-cycling and reduced its carbon footprint. It is much more difficult to show that an education experience which embraces sustainable development impacts on students to such an extent, that they will be able to secure a sustainable future. Collecting the proof presents a number of challenges but the evidence might increase engagement across the sector.

## REFERENCES

- Chan, R. (2001), "Determinants of Chinese consumers' green purchase behavior", *Psychology & Marketing*, Vol. 18 No.4, pp. 389-413.
- Cortese, A. D. (2003), "The critical role of higher education in creating a sustainable future", *Planning for Higher Education*, March-May, pp. 15-22.
- Couto, A. P., Alves, M. C., Matos, A. F. and Carvalho, P. G. (2005), "Universidade na transição para a sustentabilidade: tendências, estratégias e práticas", in N. Bryan, L. Gonçalves and O. Sanchez (Orgs), *Los Desafíos de la Gestión Universitaria hacia el Desarrollo Sostenible*, UNA/UNICAMP, Costa Rica, pp. 25-48.
- DEFRA (2005), "Securing the Future: The UK Government Sustainable Development Strategy", *The Stationery Office*, London, available at [www.defra.gov.uk/publications/files/pb10589-securing-the-future-050307.pdf](http://www.defra.gov.uk/publications/files/pb10589-securing-the-future-050307.pdf), (accessed 4 October 2011).
- DfES (2006), *Sustainable Schools for Pupils, Communities and the Environment: Government Response to the Consultation on the Sustainable Schools Strategy* available at <https://www.education.gov.uk/publications/eOrderingDownload/Government%20Response%2004294-2006.pdf> (accessed 7 October 2011).
- Dunlap, R. E. and Van Liere, K. D. (1978), "The New Environmental Paradigm", *Journal of Environmental Education*, Vol. 9 No.4, pp. 10-19.
- Ellen, P., Wiener, J. and Cobb-Walgren, C. (1991), "The role of perceived consumer effectiveness in motivating environmentally conscious behaviours", *Journal of Public Policy and Marketing*, Vol. 10 No.2, pp. 102-117.
- HEFCE (2005), *Sustainable Development in Higher Education: Strategic Statement and Action Plan*, HEFCE, Bristol.
- HEFCE (2008), *Sustainable Development in Higher Education: Consultation on 2008 Update to Strategic Statement and Action Plan*, HEFCE, Bristol.

Helferty, A. and Clarke, A. (2009), "Student-led campus climate change initiatives in Canada", *International Journal of Sustainability in Higher Education*, Vol. 10 No. 3, pp. 287-300.

IPAD (2009), *National strategy for Development Education (2010-2015)* accessed at 1 December 2011

<http://www.ipad.mne.gov.pt/SociedadeCivil/educacaodesenvolvimento/EstrategiaNacionalENED/Documents/National%20Strategy%20for%20Development%20Education.pdf>.

Jones, P., Selby, D. and Sterling S. (Eds) (2010), *Sustainability: Perspectives and Practice Across Higher Education*, London, Earthscan.

Junyent, M. and de Ciurana, A. M. G. (2008), "Education for sustainability in university studies: a model for reorienting the curriculum", *British Educational Research Journal*, Vol. 34, No. 6, pp. 763-782.

Marans, R. W. and Edelstein, J. Y. (2010), "The human dimension of energy conservation and sustainability. A case study of the University of Michigan's energy conservation program International", *Journal of Sustainability in Higher Education*, Vol. 11 No.1, pp. 6-18.

McMillan J. and Dyball R. (2009), "Developing a whole of university approach to educating for sustainability: linking curriculum, research and sustainable campus operations, *Journal of Education for Sustainable Development*, Vol. 3 No.1, pp. 54-64.

OCDE (2006), *Good Practices in the National Sustainable Development Strategies of OECD Countries*, Sustainable Development Studies accessed at 1 December 2011 in <http://www.oecd.org/dataoecd/58/42/36655769.pdf>

Pickett, G. M., Kangun, N. and Grove, S. J. (1995), "An examination of the conservative consumer: implications for public formation policy in promoting conservation behaviour", in Polonsky, M. J. and Mintu-Wimsatt, A. T. (Eds.), *Environmental Marketing: Strategies, Practice, Theory and Research*, The Haworth Press, New York, pp. 77-99.

Schmidt, L., Nave, J. G., O'Riordan, T., Guerra, J. (2011), Trends and dilemmas facing environmental education in Portugal: from Environmental problem assessment to citizenship involvement, *Journal of Environmental Policy & Planning*, 13(2), 159-177.

Shiel, C. (2007), "Developing and embedding global perspectives across the university", in Marshall, S. (Ed.), *Strategic Leadership of Change in Higher Education: what's new?*, Routledge, London and New York, pp158-173.

Sterling, S. and Scott, W. (2008), "Higher education and ESD in England: a critical commentary on recent initiatives", *Environmental Education Research*, Vol. 14 No.4, pp. 386-398.

Straughan, R. and Roberts, J. (1999), "Environmental segmentation alternatives: a look at green consumer behaviour in the new millennium", *Journal of Consumer Marketing*, Vol. 16 No.6, pp. 558-575.

Urien, B. and Kilbourne, W. (2011), "Generativity and self-enhancement values in eco-friendly behavioural intentions and environmentally responsible consumption behaviour", *Psychology & Marketing*, Vol. 28 No.1, pp. 69-90.

Wals, A. E. J. and Blewitt, J. (2010), "Third-wave Sustainability in Higher Education: Some (Inter)national Trends and Developments" in Jones, P., Selby, D. and Sterling S. (Eds) (2010), *Sustainability: Perspectives and Practice Across Higher Education*, London, Earthscan, pp55-74.

Schmidt, L., Nave, J. G., O'Riordan, T., Guerra, J. (2011), Trends and dilemmas facing environmental education in Portugal: from Environmental problem assessment to citizenship involvement, *Journal of Environmental Policy & Planning*, 13(2), 159-177.

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