Higher education for sustainability: seeking affective learning outcomes

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Abstract

Purpose – The purpose of this paper is to interpret aspects of education for sustainability in relation to educational theories of the affective domain (values, attitudes and behaviours) and suggest how the use of these theories, and relevant experience, in other educational areas could benefit education for sustainability.

Design/methodology/approach – An analysis based on a literature review of relevant educational endeavours in affective learning.

Findings – This paper suggests that most teaching and assessment in higher education focus on cogitative skills of knowledge and understanding rather than on affective outcomes of values, attitudes and behaviours. Some areas of higher education, however, have effectively pursued affective outcomes and these use particular learning and teaching activities to do so. Key issues for consideration include assessing outcomes and evaluating courses, providing academic credit for affective outcomes, key roles for role models and designing realistic and acceptable learning outcomes in the affective domain.

Practical implications – Educators for sustainability could use this relevant theoretical underpinning and experience gained in other areas of education to address the impact of their own learner-support activities.

Originality/value – Educators have traditionally been reluctant to pursue affective learning outcomes but often programmes of study simply fail to identify and describe their legitimate aims in these terms. This paper emphasises the application of a relevant theoretical underpinning to support educators' legitimate aspirations for affective learning outcomes. It will also help these educators to reflect on how the use of these approaches accords with the liberal traditions of higher education.

Keywords Education, Teaching methods, Learning, Attitudes, Behaviour, Value analysis

Paper type Conceptual paper

1. Introduction

A recent issue of the USA's *The Chronicle of Higher Education* focused on the sustainable university (20 October 2006) and produced a wealth of information on institutional attempts to promote environmental awareness, social responsibility, and sound economic stewardship. In the UK, the sector's key funding body Higher Education Funding Council for England (HEFCE, 2006a, b) has developed its own sustainability strategy and seeks buy-in by the HE sector. The Australian Government may be particularly committed to help ensure that the needs of education for sustainability across Australia are being met, as evidenced most strongly through their influential AIRES (2006) research agenda. Higher education institutions from around the world are involved in various ways in promoting sustainability. By any measure, the range of higher education-based initiatives accomplished in the name of sustainability is truly remarkable.

Central to all of these developments is the core concept recently restated by University of Florida's President J. B. Machen "I graduate 15,000 students a year. If I could turn out half of them with a sensitivity to sustainability and turn them loose on the world, that's a hell of a contribution" (Carlson, 2006). Perhaps, higher education has a particular and specific function, to graduate influential citizens who value their environment and appreciate that they have a responsibility to help to sustain it. To achieve this, Machen and other leaders in this higher-education-led transformation appear to be seeking far-reaching curriculum and institutional changes of the order identified by the Talloires Declaration and exemplified by Toyne's (1996) greening of the curriculum approaches of the 1990s in the UK. More recently Tilbury *et al.* (2005, p. 15) have emphasised that "Curriculum change offers the opportunity to embed the principles of learning for sustainability such that all students can address sustainability."

But what are these principles of learning for sustainability and how do these projects relate to students' learning outcomes and educational theory? How effectively do they impact on student learning? What curriculum changes are envisaged, what do they attempt to achieve and in what way might they be different from what has come before? Is there an existing educational theoretical framework within which Tilbury *et al.*'s need for all students to address sustainability, and Machen's aim for at least half of them to be sensitive to sustainability, can be addressed?

It is possible to separate what students learn about sustainability during their experience of higher education, from what they learn to value during this same period. Relevant theory separates affective learning from cognitive learning. Affective learning relates to values, attitudes and behaviours and involves the learner emotionally. Cognitive learning relates more to knowledge and its application. It is possible to construct an argument that the essence of education for sustainability is a quest for affective outcomes. This paper constructs this argument and identifies how interpreting aspects of education for sustainability as education in the affective domain will allow educators to categorise the multiplicity of sustainability projects, determine their limitations and acceptability, and benefit from the theoretical framework of affective learning in designing new sustainability interventions. A key element of this process is to explore how other branches of higher education seek and achieve affective outcomes, in an attempt to apply the learning that all branches of education have achieved, to the needs of educators for sustainability.

2. Theoretical foundations of educating for values, attitudes and behaviours

Bloom and Krathwol (1956) and Krathwohl *et al.* (1973) systematically examined domains of learning in the last century. It would be fair to say that educators, particularly higher educators, have traditionally focused on the cognitive domain of learning; what we know and understand, and how we describe, comprehend, apply, analyse, synthesise and evaluate this knowledge and understanding. But Bloom *et al.* also identified levels of learning in the affective domain. The affective domain is about our values, attitudes and behaviours. It includes, in a hierarchy, an ability to listen, to respond in interactions with others, to demonstrate attitudes or values appropriate to particular situations, to demonstrate balance and consideration, and at the highest level, to display a commitment to principled practice on a day-to-day basis, alongside a willingness to revise judgement and change behaviour in the light of new evidence.

Students' motivation to learn and their emotional state whilst learning are also elements of the affective domain (Beard *et al.*, 2007). Bloom and Krathwol categorised the affective domain, but a range of theories, based in a range of disciplinary contexts, address how educators contribute to the development of student attitudes and values. These include learning theories (based around positive reinforcement and cognitive dissonance) and social learning theories (based around social constructivism) as reviewed by Miller (2005). Miller emphasises that even where they are not explicitly stated, affective objectives are pervasive in education.

Since, Bloom *et al.*'s early work, other taxonomies of learning outcomes have been developed, often for discrete elements of higher education. For example, Carter (1985) in summarising the work of many others after Bloom *et al.*, conceptualised the attainment of values and attitudes within the category of personal qualities (alongside knowledge and skill) for professional education. Although it seems intuitive that some elements of both cognitive and affective domains should be easier for students to acquire than others, and this approach has underpinned the development of level-based curricular throughout higher education in recent years, not all analyses place elements of affective learning in a hierarchy. Some reviews emphasise the difficulties that educators will always face when teaching affective outcomes. Indeed, education has often avoided these affective goals. It is quite possible for learners to learn about their subject and be able to describe, comprehend, apply, analyse, synthesise and evaluate to the extent that they can pass their exams, without actually changing their attitudes as indicated by the way they respond or behave afterwards. Bloom *et al.* (1971) discussed this educational failure in a general context. They suggested that educators avoid being too open about their affective objectives because they are concerned about charges of indoctrination or brainwashing. In addition, many educators regard these matters as "private" rather than public and also express concern that affective outcomes are far too long term to be assessed within the timescale of any particular learning programme. These issues have not yet been resolved by higher education practitioners and it not unknown for educators to be accused of indoctrinating practices (see Carlson, 2006, for an example in the area of college sustainability). In addition, it is still relatively rare in education for attainment of these values and attitudes to be openly assessed or for programmes that attempt to, or inadvertently, develop values to be evaluated on this basis. The term "hidden curriculum" has been used to describe these and related anomalies (Atherton, 2005; Margolis, 2001; Rowntree, 1981).

3. Education for sustainability seeks knowledge, skills and affective outcomes

Higher education initiatives that seek outcomes related to environmental sustainability are extremely diverse. They may involve taught elements with conventional knowledge-based learning outcomes directly related to environmental studies. They may involve taught elements in subjects not directly related to environmental studies, but within which environmental themes are developed. They may also involve the institution making business decisions relating to energy conservation or recycling, or even leadership of, and influence on, local, national and international networks. In most cases, there is an explicit or implicit intention to not only inform groups and individuals but also to influence them to subsequently behave in a particular manner:

> ... Higher Education's most valuable contribution to sustainability lies in providing large numbers of graduates with the knowledge, skills and values that enable business, government and society as a whole to progress towards more sustainable ways of living and working (Chalkley, 2006).

Chalkley expresses the view that education for sustainability must seek outcomes that involve not only knowledge and skills but also the values that underpin sustainable behaviour by businesses, government and society. Chalkey's categories of knowledge, skills and values (linking as they do with Carter's and Bloom *et al.*'s categories described above) indicate that education for sustainability seeks three primary outcomes; graduates should know about sustainability issues, they should have the skills to act sustainably if they wish to and they should have the personal and emotional attributes that require them to behave sustainably. In some cases, however, higher education specifically avoids situations that may appear to influence students to subsequently behave in a particular manner. Lemkowitz *et al.* (1996), for example, provide an example of a long-established first-year course for science and engineering students that stimulates critical and creative thought in sustainability (and assess its attainment), but does not attempt to teach any particular viewpoint or assess students on their attainment of particular values and attitudes.

The hierarchical nature of affective learning outcomes, as proposed by Bloom *et al.*, may prove to be important as it emphasises that, as with cognitive skills, some outcomes may be easier to achieve than others. This hierarchy is relatively straightforward to apply to the developing environmentally aware learner. We start with a willingness to listen, to read and to acquire information. We progress to discuss environmental issues with others and then formulate our own views on the issues to develop opinions that shape our own interactions with others, and with our environment. Later, we start to make life choices and experiment with prioritising "good for us" "good for our dependants" and "good for our descendants". At some point, and at the top of this particular hierarchy, we emerge showing self-reliance, an ability to cooperate or even lead, the confidence to live our life in the way that we chose and a commitment to constantly seek new ways to achieve and to reassess our decisions. The hierarchy also allows higher educators to address values, attitudes and behaviours to different extents, depending on their own stance towards these complex issues. Many educators are comfortable with teaching processes that emphasise a willingness to listen, to discuss and to acquire information. But, they may not be comfortable with a quest for higher order outcomes relating to opinions and behaviours, as described by Lemkowitz *et al.* (1996).

Initiatives also operate at several levels. In the UK, for example, HEFCE funds higher education institutions and seeks to influence these institutions, or members of them, to themselves seek environmental sustainability:

> We recognise that we need to continue our own transition to sustainable development. We cannot hope to influence the sector in a significant way, if we are not an exemplar of good practice ourselves (HEFCE, 2006a, b).

At all levels, it should be apparent that knowing how to perform sustainably, and having the skills to do so, are not on their own sufficient to ensure that individual and group behaviours are in fact sustainable.

Research in the area suggests that leaders in higher education should not underestimate the difficulties involved in achieving affective outcomes or in encouraging teachers to seek these outcomes. The Toyne (1996) and Ali Kahn (1996) initiatives in the UK in the early

1990s produced very few examples of "greening of the curriculum" in higher education. More recently, phenomenographic research in Australia has demonstrated that sustainability and teaching tend to be seen by university teachers as separate entities with little appreciation of the role of university teachers in promoting sustainability (Reid and Petocz, 2006). These authors suggest that teachers in higher education do not yet share a common language about sustainability and are actually far from this state.

4. Which disciplines and interdisciplinary areas openly seek affective learning outcomes and how do they achieve these?

Higher education may find affective education difficult to "roll out" but there are some areas within higher education where affective attributes have been valued and sought after for many years. The paragraphs below briefly describe some of these areas and interdisciplinary activities with a view to identifying successful approaches to yield affective outcomes and identifying some of the key factors that promote or limit attainment of affective outcomes. Experience has suggested that certain teaching and learning activities are most successful in encouraging students to move through the affective domain's hierarchy. In a general learning and teaching context – discussion, open debate, peer involvement, role playing, problem-based learning, engaging with role models, simulations, games, group analysis of case studies, expert engagement, perspective sharing via reflection, appropriate use of multimedia to trigger responses – all provide the mainstay of learning activities in those areas of higher education where affective outcomes are sought and respected (Ornstrein and Lasley, 2000; Woolfolk, 1998; Leng, 2002; Shephard, 2005, Howe, 2003; Deyer and Bongero, 1994).

One area where affective outcomes are now openly and successfully sought is health sciences. Doctors, nurses and related health professionals are trained to heal but their training also seeks to ensure that they display caring attitudes towards their patients. Educating professionals to care involves setting learning outcomes that include affective attributes and using learning and teaching activities that promote their attainment (Howe, 2003); ensuing that role models act appropriately (Gagne, 1985; Paice *et al.*, 2002); and using appropriate and effective assessment practices (Howe, 2003). Selection processes may eliminate those with embedded inappropriate attitudes, but educational processes are now openly employed to enhance appropriate attitudes. Inter-professional education is also developing as a major educational advance in the health sciences in an attempt to break down attitudinal barriers between professions during training. In one large-scale project in the UK, extensive use is made of online communication within groups of mixed professions to promote inter-professional dialogue and improved inter-professional attitudes (Macleod Clark *et al.*, 2005).

Some educators have developed a formal interest in those aspects of the affective domain of learning that relate to character development. There is, for example, a peer-reviewed *Journal of College and Character* published by the Center for the Study of Values in College Student Development at Florida State University (2006) with a focus on moral and civic learning in higher education. This source provides a wealth of information about how this sector of higher education views the role of higher education in developing a specific range of affective outcomes in its graduates. An editorial summarises a range of higher education-based activities that are promoted to achieve attainment of affective learning outcomes. These include: community service and service learning; religious and spiritual activities; leadership education;

diversity education; peer advising and leadership; disciplinary and judicial programs; participation in student governance organizations and activities; recreational coaching, refereeing, and judging; student activities programming; and travel (Dalton and Crosby, 2006).

It is worth exploring one of these areas in more detail; that of service learning and community-based teaching. There are many facets to these developments, but most relate to utilising experiential learning (learning by doing) to achieve affective learning outcomes. As defined by Maas Weigert (2006, p. 6):

> Community-based learning is an academic course-based type of experiential learning in which the student provides some meaningful work for and with disadvantaged individuals or groups, and where such work meets a need defined by a community, is rooted in the course objectives, integrated into the course by means of assignments that require some form of reflection on the work in light of the course objectives, and is assessed and evaluated accordingly.

Typically, such courses seek affective outcomes that include a range of values, attitudes and behaviours such as a commitment to promote racial understanding and social justice. Maas Weigert (2006) cites significant research evidence that course-embedded community-work does contribute to the attainment of affective outcomes.

Affective outcomes also underpin some of the generic attributes that many higher education institutions claim to instil in their graduates. Indeed, the graduate attribute statements of some higher education institutions suggest that they are in optimum positions to influence the values and attitudes of their students. The University of Sydney (2006) for example, suggests that:

> Graduates of the Faculty of Veterinary Science will hold personal values and beliefs consistent with their role as responsible members of local, national, international and professional communities. (E.g. protect the natural environment, maintain biodiversity and conserve endangered species).

Institutions may then broadly formulate how they will encourage the development of these values in students in an institutional learning and teaching strategy or plan. There is some data on how well institutions actually deliver graduates with the required attributes (Phillips and Bond, 2004; Bath *et al.*, 2004) but not when the attributes relate to attitudes and behaviours rather than to discrete abilities. There is a clear need for institutions to reinterpret the learning domain of their desired graduate attributes (as described by Barrie *et al.*, 2003; Barrie, 2004, at the University of Sydney). Measuring graduates' critical thinking, problem solving, group work and communication abilities may not be enough without clearer articulation of the link between ability and behaviour.

Academic development is a different category of discipline whose reason for existence is understood by many to be to change the professional practice of educators. Gosling (2001), for example, surveyed members of the Heads of Educational Development Group in the UK and reported, "all the respondents agreed that it was their role to encourage innovation and change in teaching and learning". Arguably, the essence of intended change relates to a teacher's conception of teaching; often from a teacher-centred to a student-centred perspective. Other substantial changes include enthusiasm for the introduction of learning technologies (Shephard, 2004). In both cases, educational development succeeds if learners change their attitude and resultant teaching behaviours.

These are undoubtedly affective outcomes, and although they are rarely recognized as such, educational developers make use of a distinctive range of teaching approaches to achieve them. Changes in educational professional practice may be directed from above, but more often appear to be produced by progression starting with educational research, moving though academic development and ending in evaluated changes in teaching practice (Shephard, 2006). Academic staff developers and educational evaluators may be pivotal in this sequence (Tilbury *et al.*, 2005; Shephard, 2005) but are probably no more likely than university teachers to change behaviour as a result of research and learning. Baume addresses the likely effectiveness of educational evaluation and educational research. Baume (2003, p. 86) quotes Miller and Partlett (1974) to note that:

> It is little exaggeration to assert that educational research has had negligible impact on the workings of educational institutions and on the ways in which academic men and women reflect on their professional activities'. Almost 30 years later on this is still mostly true, and probably as true for educational evaluation as for educational research.

One study demonstrated the potential of e-learning (specifically, online synchronous tutorials using role-play) in achieving affective outcomes in this group (Shephard *et al.*, 2004). Affective changes of this nature are easily missed unless specifically assessed or evaluated.

There remains an eclectic mixture of activities and enterprises that have been developed in higher education and, at least in part, are seen as contributing to the attainment of affective outcomes at the individual or group level. Two examples will suffice to illustrate the range, complexity and current status of this mixture. Reid *et al.* (2006, p. 90) describe how art may have a particular role.

> ... the engagement of artists in corporate environmentalism has a deeper value – one we would argue is critical to the mainstreaming of tertiary environmental programmes. As previously stated, art – as purposeful creativity – forces the viewer to adopt a normative position, it forces the individual to assess his or her own environmental values. By extension, art can foster a corporate morality – a set of values – that are more critical than financial benefits or legislative compliance in drawing environmental issues into mainstream. It can act as a catalyst for the development of individual and corporate ecological stewardship.

It will be interesting to see education-based evidence to support this assertion in the future. Another example is based on an acceptance that the learning goals associated with education for sustainability are more complex than those in many areas of study. They often include group processes, contexts based in science and society, and competencies that involve judgement that integrate conflicting experiences and incomplete information sets. A learning framework that is becoming widely used in sustainability education and research is the trans-disciplinary case study (TCS) approach (Scholz *et al.*, 2006). Stauffacher *et al.* (2006) argue that this use of TCS is based on both functional socio-cultural constructivism and project-based learning and that students become enabled to tackle complex real-world examples. It remains to be demonstrated that behaviours developed by students during TCS-based learning activities are replicated in real-world examples, but this condition almost certainly applies to all forms of teaching for affective learning outcomes.

5. How may interpreting sustainability outcomes as affective outcomes help education for sustainability?

The examples described in Section 4 add to the literature on teaching and learning in the affective domain and result in an expanding professional understanding of the domain. One purpose of this paper is to draw some generic conclusions from this multidisciplinary literature to identify key aspects of affective domain teaching that could apply to education for sustainability. Based on the literature included here, the author of this review identifies, in particular, four areas of interest; assessment and evaluation, academic credit for affective outcomes, roles for role models and designing learning outcomes in the affective domain.

5.1 Assessment and evaluation

Even where affective learning outcomes are clearly articulated and obviously valued, it is notoriously difficult for teachers to assess performance and give credit for achievement. Traditionally, difficulties relate to the practicality of determining a student's values so that changes may be monitored. Howe (2003) describes, in the caring professions, how portfolios are increasingly used as vehicles to relate experience to learning via reflection. Howe also points out that objective-structured clinical examinations (OSCEs) are now widely and summatively used in clinical education and that they are designed to specifically assess the attainment of some affective learning outcomes. Several groups are currently developing virtual or mock digital OSCEs to prepare students for face-to-face examinations (University of Bristol, 2006). There are many examples in the literature, however, where the validity of assessments in the affective domain have been in doubt (Gratton, 1996).

The early work of Bloom *et al.* (1971) also provides suggestions of how courses that promote the acquisition of values, attitudes and behaviours can be evaluated to measure the degree to which they enable students to acquire the required outcomes. They advise that evaluation can be achieved on a group-wide basis and that this approach avoids some of the really difficult issues in assessing the attainment of values. The situations, tools and techniques involve the use of surveys, questionnaires and semantic differential techniques.

5.2 Credit for attaining affective outcomes

Many authors have deplored the tendency for affective outcomes to carry little or no weight in summative assessment (see for example, Howe, 2003, in relation to teaching medicine; and Maas Weigert, 2006, in a discussion on community-based learning). These authors point out that where institutions provide credit to students who attain openly indicated affective outcomes, the reward for doing so justifies the involvement that is necessary to succeed. There are strong links between this issue and that of the hidden curriculum. There is a clear need for consistency in learning cultures so that students' understanding of what their course is seeking to achieve is underpinned by the structures and processes that play an important part in shaping their learning experience (Ottewill *et al.*, 2005). There is also a need for consistency between the attitudes and values implicit in an educational curriculum and those characteristic of a particular profession (Carter, 1985). Arguably, the best approach to forge this consistency is for educators to be open about their intended learning outcomes and to reward attainment of these outcomes accordingly.

5.3 Key roles for role models

There is little doubt that the literature on affective learning in higher education emphasises the importance of appropriate role models. Early work on the conditions for learning by Gagne (1985) emphasised the importance of role models in teaching affective outcomes and the literature also identifies how poor role models may lead to the acquisition of the wrong values (Paice *et al.*, 2002). Paice *et al.* (2002) even imply that some health care practitioners are such bad role models that students should not be exposed to them least they receive conflicting messages. More recently, in some highly quantitative research, Q methodology was used by educational psychologists Ray and Montgomery (2006) to measure the subjective views of students, staff and faculty towards current and ideal character education. The research emphasized the overwhelming importance of appropriate role models in affective learning in all forms of learning identified by these researchers.

5.4 Climbing the hierarchy

Early research by Bloom *et al.* suggests that the design of teaching and learning activities does need to ensure that learners progress through the hierarchy of affective outcomes so as to avoid values being entrenched rather than developed (Krathwohl *et al.*, 1973). It is also possible to use Bloom *et al.*'s affective domain to design realistic and assessable learning outcomes in the affective domain in the same way as educators use the cognitive domain to design cognitive outcomes (see for example Leng's (2002) taxonomy of affective objectives in an e-learning context.

This hierarchy is also a great asset to enable teachers to consider the acceptability of their approach to their profession, their institution and to the liberal traditions of higher education. Most teachers probably find it acceptable to encourage their students to be willing to listen, to read, to acquire information, and to discuss environmental issues with others. In these ways, they are happy to create opportunities for students to formulate their own views on the issues based on their experience and learning. But, some teachers are apparently prepared to go further. They require students to develop particular attitudes and to behave in particular ways, often in relation to the stated values of their future profession, and assess them on their ability, and willingness, to do so.

6. Conclusion

This paper suggests that a central element of education for sustainability is a quest for affective learning outcomes of values, attitudes and behaviours. It describes the theoretical foundations of this form of education and interprets a range of educational endeavours in these terms. It supports this analysis by identifying other areas of higher education that attempt to achieve affective learning outcomes and by describing how they do this. The paper proceeds to consider key aspects of teaching and learning in the affective domain that potentially have application in education for sustainability. These include the need to design particular approaches for assessment and evaluation, the need to give academic credit for affective outcomes, the pivotal role of role models, and the need to achieve realistic, assessable and acceptable learning outcomes in the affective domain. These examples and this analysis asserts that some disciplines in higher education actively seek particular attitudes and behaviours as student learning outcomes whereas in many areas, teachers attempt to stimulate critical analysis without seeking particular values, attitudes or behaviours. By categorising the range of affective outcomes in a hierarchy or other form

of taxonomy, it is possible for teachers to address the acceptability of their approaches to their profession, their institution and to the liberal traditions of higher education. This area of study is particularly important to higher education for sustainability as an emerging field of enquiry. Research that contributes to epistemology and contextualisation in this field was recently identified as one of several priorities by a cohort of higher education for sustainability experts (Wright, 2007). To benefit from this analysis and from the experience of other educators who attempt to achieve affective outcomes, educators for sustainability need to identify which of their intended learning outcomes are indeed affective outcomes of values, attitudes and behaviours.

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