Education for Sustainable Development and the Need for Pluralism

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Andrew Mearman
School of Economics
University of the West of England
Coldharbour Lane
Bristol
BS16 1QY.
E-mail: Andrew.Mearman@uwe.ac.uk
Tel.: 44-(0)-117 328 3201

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Introduction

There have been several and continual calls for pluralism in economics over the last twenty years or so. Caldwell (1982) can be regarded as a starting point for many further calls and investigations, the most notable of which are Caldwell (1991), Salanti and Screpanti (1997), Dow (2004a) and the petitions by groups of students in Paris, Cambridge and Kansas City at the turn of the new century. However, these calls have been somewhat ignored. For example, mainstream economists proclaim that they are pluralistic, and cite the diversity of approaches within the body of their own theory: the contrast between GE and game theory being one such example. However, those same economists are accused of actively excluding heterodox economists and economics from the debate, through hiring and publication decisions. Equally, though, heterodox economists remained organised into schools ploughing single furrows and implicitly arguing for the superiority of their explanations.

However, this paper argues that pluralism has several benefits and that it is inevitable if economists are honest about the epistemological and ontological constraints they face. Moreover, the paper argues that pluralism has several distinct educational benefits. Specifically, the pluralist approach has several potentially beneficial effects for the teaching and learning of sustainable development. That specific area of concern has been chosen to reflect a new concern, and indeed initiative, of the Higher Education Academy to embed the concept of sustainable development in the higher education curriculum.

The paper proceeds as follows: first, the concept of pluralism is considered. Thereafter, justifications for pluralism are dealt with. Third, the implications for education of the arguments for pluralism are discussed. Fourth, specific implications of pluralism for education for sustainable development (ESD) are presented.

What is pluralism?

Perhaps inevitably and appropriately there are many definitions of pluralism. Surveys of the meanings abound; perhaps the best is in Screpanti and Salanti (1997), in which treatments by Mäki, and by Dow are the most informative. Mäki identifies plurality, i.e., the existence of many entities of one category; he identifies a range of different pluralities, for example, ontological, veristic, theoretical, epistemological, methodological, meta-methodological, ethical and ideological. He then distinguishes plurality from pluralism, i.e. the advocacy of plurality based on some set of reasons. Further, the entities identified in a plurality can be complements, i.e. parts of the same truth, or substitutes, i.e., competing elements of the truth. Moreover, pluralism can be relative (to a set of conditions) or absolute; and it can be temporary (limited to a set of time periods) or permanent. Most economics courses are temporarily pluralistic: they cursorily address alternatives before moving on to concentrate on the favoured explanation.

Pluralism can be a positive or a normative (or descriptive/evaluative) position. Pluralism is literally a plurality of entities; but it also entails an advocacy of such a plurality. This paper takes for granted that there exists a plurality; but it also advocates plurality, i.e., it adopts a pluralistic position. This advocacy is based on general reasons for pluralism; but also on reasons specific to the subject of ESD. Immediately, this choice of a definition implies a problem, and indeed a contradiction: why arrive at a single definition of pluralism; and indeed, how is that decision reached? That decision and its process and implications are discussed further below.

As a further complication, there are of course various levels of knowledge: any subject area can, following Dow (2004a), be thought of as a structured, layered entity. Thus, economics has layers which include policy advice, theory, understanding of an event or situation, method, methodology, epistemology, ontology, meta-narrative, ideological narrative, ethical position, type of logic, etc. There are many examples at each of these levels. The most commonly considered level is that of theory: most of the controversy in economics has concerned a plurality (or lack) of theoretical approaches; however, there have of course been other debates, for example about the best choice of method.

It should be noted immediately that pluralism is not necessarily the same as eclecticism. Eclecticism is associated with anything goes. It is based on an ontological position, i.e., that reality is so fragmented that knowledge must also be fragmented, but in practice it is often abandoned; indeed, it is self-contradictory because it is a meta-narrative and yet postmodernism rejects meta-narrative.

Pluralism can have disadvantages: people do not have a uniform meaning of the term; it is sometimes synonymous with ignorance (Delorme, 1997). I shall define pluralism as the advocacy of a plurality of entities at various levels of knowledge, but specifically at the methodological, method and theory levels.

Justifications for pluralism in economics education

As there are many definitions of pluralism in economics education, there are also many justifications for it. These justifications also take different forms: some are advocacies of pluralism; others are claims of its inevitability and thus, of the impossibility of monism (i.e. single entities) at various levels. As with any plurality or heterogeneity it is inevitable and helpful to place temporary, analytical constraints, in the form of abstract categorisations, on the range of entities. Thus, the arguments for pluralism are grouped into ontological, epistemological and educational philosophical categories. The former pair mainly reflects prior philosophical arguments in the literature. Ontological arguments are considered first, because many of the epistemological arguments rest on these ontological positions.

Ontological constraints on monism

Science has traditionally rested on the assumption of cosmological unity or at least structure, such that there is "one world" (Mäki, 1997) which might be discovered by scientific enquiry. This assumption does not require rule out theoretical pluralism, as will become obvious below. Several recent contributions have questioned the unity of nature, such that a plurality of entities might be said to exist. This plurality might be in the sense – well established and debated – that reality may comprise multiple substances, such as mind and matter. Also, though, recent developments in theoretical physics have considered the possibilities of multiple realities. Relatedly, postmodernist philosophers have argued that each individual's experience and therefore account of reality is as valid as any other and thus that there is no single reality, merely collections of alternative realities. This greater acceptance of heterogeneity of individuals has permeated into economics, through, for example, Sen's capabilities approach, which attempts to capture the diversity of individuals and their goals, etc. (see, for example, Benicourt, 2005).

The fragmentation of reality (see Dow, 1997 for a discussion of the postmodernist position) has various implications, most notably a rejection of concepts such as general equilibrium. In this context, the most implication of postmodernist fragmented reality is that no general theory, or any one theory which purports to explain the whole of (a single) reality is admissible. Further, given that the individual has the ability for multiple understandings of an event, etc., so there is no reason to think that a discipline would have a single understanding (Dow, 1997). Thus, a plurality of theories is inevitable, appropriate and licensed by the nature of reality. Moreover, other postmodernist arguments (see below) stress that no account has special licence, validity or priority. Therefore, pluralism of theory is adopted.

However, there are many practical and philosophical objections to postmodernism and I do not wish to support it too strongly. For example, postmodernism rests on several meta-narratives, even though it purports to reject meta-narratives. However, at the same time, there is no need to ditch all of its insights. Indeed, many other literatures have recently (and in some cases, for some time) stressed ontological reasons for pluralism. Recent developments in complexity stress that no single theory or even method is able to capture the entire complex reality. Even GE models tend to make simplifying abstractions. Thus, in Mäki's (1997) terms, because the 'one world' is complex, this justifies (ontological and) 'veristic' pluralism (Mäki). Since no single model can capture the whole of reality, several models are needed. All models are by their nature incomplete therefore no model could ever claim to be complete and the only one available (Samuels, 1997). Multiple angles on a problem are needed: Fullbrook (2005) uses the analogy of looking at the statue *David* from many different locations. Similar arguments have been made in favour of triangulation (see Downward and Mearman, 2005).

Related to complexity is the notion of openness. This notion has been developed recently by a number of different authors in different ways. It is beyond the scope of this paper to survey those approaches. However, to summarise, openness can result in several, complementary ways. For example, open systems are those in which event regularities of the sort 'if x then y' are unlikely to result (Lawson, 1997). Open systems involve the (often intermittent and unpredictable) interaction of multiple mechanisms. Open systems

have permeable, fuzzy and shifting boundaries (Dow, 1996). Open systems allow flows of inputs and outputs, which may change the internal composition of the system. Open systems are usually also complex. Open systems have several implications in this context. Because they are so complex and have interacting mechanisms (for example), in open systems abstractions and impositions of 'closures' on the open system are inevitable (see Dow, 1996; Mearman 2004). However, such abstract closures are necessarily partial; thus, any theoretical system can have only partial application in an open system, so any model is incomplete (Dow, 1997). No single model or abstraction to a single mechanism, or even set of mechanisms, can realistically hope to capture all the factors necessary to reach a complete explanation of a phenomenon(a). Therefore, multiple theoretical accounts are required. Also, the nature of reality is such that some objects are not prone to quantification, so multiple types of data and methodologies are required.

Another implication of openness is that reality can change or evolve in (unpredictable and) nondeterministic ways; moreover, these changes are endogenous to the system and can be over short time periods (Budzinski, 2005). As Samuels (1997) puts it, economic reality is heterogeneous and kaleidoscopic: any account may be 'true' but necessarily incomplete; indeed, it may be simply rendered obsolete, or at least highly context-specific. Such considerations are clear in many literatures; indeed, they are implicit even in the Lucas (1976) critique of economic policy, in which the object is changed by specific agents in the economy, rendering it unsusceptible to control.

Lucas' (1976) position is of course predicated on rational expectations, i.e., that agents will not systematically on average get predictions wrong. However, in other literatures, openness and complexity renders reality fundamentally – i.e., non-probabilistically – uncertain. That is the implication of Keynes' approach, as expressed in his criticisms of Tinbergen's early econometrics (Keynes, 1939). Keynes's arguments and approach raises questions about the appropriate form of logic which should be used in decision-making. As Dow (1997) shows, the nature of the reality is contrary to the axioms of classical logic, given that the latter is based on systems comprising atomistic entities closed off from outside influences. Therefore, an alternative form of logic is required, one which is 'human' and draws on such things as common sense. The implication for pluralism is that no one logic is appropriate; no single theory or method can be relied upon; that a range of methods must be used; and that judgement is essential for decision-making under uncertainty.

Epistemological constraints on monism

Although Samuels (1997) argues that there is no licence for moving from an ontological position to a specific substantive position – and indeed this is one of his arguments for methodological pluralism – the next stage of the argument is to examine epistemological reasons for pluralism, many of which are based on ontological conditions. Already we have considered the arguments of Dow, based on Keynes, that a specific logic – different from classical logic – will be required in an open, uncertain environment. That argument underpins some of the arguments below. However, many of the arguments rest more on

epistemological considerations and on observations from the history of thought (from several disciplines).

The first argument for pluralism is of this latter type. It is also found in Keynes. However, it has been developed notably by Popper. That is, the need to choose methods, theories, etc. according to the particular context within which one is operating. In Popper (1959) this was known as 'situational logic'. This implies that there is a plurality of logical systems. For example, Delorme (1997) argues that one can contrast analytical (classical) logic versus complexity logic. For Delorme, analytical logic rests on key principles such as the law of the excluded middle, whereas complexity logic reflects the ontology of complex (and open) systems. As a result, complexity logic is based on the predicates of unpredictability of outcome, operationality (not operational*ism*) and, often, intuition. This is particularly relevant for studying environmental issues, in which, as has been well established, the logic underpinning neo-classical economics is of limited use (see for example, Eberle and Hayden, 1991). Moreover, indeed one should employ multiple logics rather than simply relying on one. Further, reflecting the move away from traditional, prescriptivist methodology, the argument has been made that every piece of research has to choose its own method (see Dusek, 2005, for a recent restatement of that argument).

The previous argument hints at another: that of the greater depth and/or richness afforded by pluralism. Clearly if situations demand different methods, then better theories will result if that demand is met. This argument also follows from ontological considerations: given that there is heterogeneity or diversity perceived in a subject matter (Delorme) and a heterogeneity of agents, diversity of methods, theories, etc., is also required. Samuels (1997) holds that no specific role or theory in economics can perform all the roles required, which include explanation, description, prediction and prescription, and this licenses pluralism. Dow (1997) argues that different types of analysis provide shades of meaning which can deepen understanding. Such an argument once again flows from her ontological claims that strict definitions and categories are not possible because the nature of the object of analysis renders this impossible. Related to this claim is that made by Dow and others (for example Klaes, 2003) that there is both an inevitability and desirability of the vagueness of concepts. More broadly, in the spirit of openness, contrary to the imposition of a theoretical position (see below), pluralism involves the open-ended intellectual quest rather than artificial restriction of thought through method (Dusek, 2005).

Such openness is necessary because of the limited ability of science to arrive at ultimate methodological principles or single theories. Samuels (1997: 67) holds that methodological pluralism comes from the "necessity of choice in the absence of a single conclusive methodological or epistemological principle". There is no set of *the* methodological principles: no set has been established unequivocally. There is no basis for choosing within a plurality of narratives (Brown, 1994) (Dow, 1997). More generally, as Benicourt (2005) argues, there is an absence of incontestable foundations. For example, there are different ethical bases for analysis (see Sen's work). Again, this flows

from the nature of the world, in which consensus on truth – i.e., under a convention theory of truth – is impossible.

Epistemologically, single theories are also impossible to arrive at. For instance, the Popperian system of crucial tests and falsification is flawed, because confirmation and rejection are limited: every test is subject to the constraint that there may be some decision rule, hypothesis or data set by which a theory might be confirmed or rejected; in general rigorous testing cannot be done; so testing is not a universal criterion for theory selection (Samuels, 1997). Further, the theory-ladenness of facts means that empirical tests cannot be conclusive (Samuels). Thus, following Kuhn, better theories are not always selected, i.e., the process of selection is imperfect (Budzinski, 2005). Moreover, following Popper, the selection process to find the best, ultimate theory is incomplete (Budzinski). Theories are also fallible – as they are indeed generally – to previously undiscovered evidence (Budzinski). Consequently, from Lakatos, dominant theories might not be superior (Budzinski). As a result, lock in to a specific theory might constitute scientific regress and might be inefficient, because 'better' theories are ruled out a *priori* (Budzinski).

Much of the above is highly relevant in economics because of the existence of a dominant view, which in practice adopts a monistic approach to theory ('neo-classical'), method (formalism), methodology (positivist), ontology (atomist), and even ethics (utilitarianism). This power is prone to dictate the principles which apply at various levels. For example, the dominant theory decides which questions and which type of questions get asked (from Kuhn). Some occupants of dominant positions try to argue that their positions are justified somehow, perhaps in evolutionary terms. However, rather, Samuels (1997) argues that all such dominant positions reflect past privileged positions and the result of institutional elements and inertia (Dusek, 2005). In any case, the dominant theory cannot be proclaimed the best or victorious because that confuses the positive and normative (Budzinski, 2005), which of course is contrary to its stated position. Pluralism based on the need to achieve a just distribution of academic power (Mäki, 1997).

Finally, in this category the observation can be made that economics in actuality is pluralistic: for example, the theory of the individual is being significantly challenged by experimental economics, another area of study considered mainstream. Further, in practice methodological procedures tend to be combinations of elements so no strict position is justified (Samuels, 1997). Moreover, the history of thought of economics exhibits a series of failures of the subject to achieve one theory, for example on the inability to transcend the micro/macro split, for example through GE (Sonnenschein-Debreu-Mantel result). Furthermore, competition theory exhibits considerable plurality (Sent, 2004).

Educational justifications for pluralism

Clarke and Mearman (2001, 2003) have argued that a) economics education is ignorant of its own (often implicit) goals; b) economics should be focused on achieving so-called

'intrinsic' goals of education (at least in addition to so-called 'instrumental' goals); and c) economics can achieve these goals partly by adopting a 'parallel perspectives' approach. Clearly, a parallel perspectives approach is pluralistic, because it requires that two perspectives (usually pitched at the theoretical level) be taught in parallel, taking each seriously and, ideally, asking students to reach their own conclusions[1]. It could be said to be a limited pluralism, because only two views are being considered; but if the approach taken by the instructor/facilitator is open, the benefits of pluralism can be achieved. This approach has several advantages: it fulfils the goals of liberal education; it is able to cope better with students' learning styles and personal epistemologies; and it aids the students' decision-making skills.

The first element to this argument is to discuss the benefits of pluralism in terms of educational philosophy. Clarke and Mearman (2001, 2003, 2004) discuss the established contrast between 'liberal' and 'instrumentalist' education. The dichotomy rests on a further distinction between education which is 'intrinsically' beneficial or that which is 'instrumentally' beneficial. Instrumental benefits are those concrete, identifiable skills, such as the ability to solve certain types of problem, know formulae or techniques, remember and perhaps apply theory; in general, instrumental benefits involve the achievement of specific narrow learning outcomes. An education which is geared to such instrumental goals, clearly (if not knowingly) at the expense of other goals, may be regarded as 'instrumental*ist*'. An example of instrumentalist education is one in which a student is indoctrinated into a particular view. It has been argued, by those such as Hobsbawm **(ref),** that education is inherently indoctrinatory, and indeed that state education was begun with the aim of indoctrination in mind. More broadly, though, any educational process can be regarded as indoctrinatory if whatever content is delivered is done so uncritically.

Such uncritical delivery would be considered contrary to the tenets of 'liberal' education, which argues that educational is intrinsically beneficial, for its ability to foster analytical, critical and comparative thinking, leading to the development of an open-mindedness and flexibility of thought. On this liberal approach, a parallel perspectives approach is licensed. Note that such an approach is not inevitable: it should be possible to teach one perspective – whatever that is – and still achieve the liberal aims. However, as Clarke and Mearman (2001, 2003) have argued, this tends not to happen in economics in any systematic sense. Indeed, in the UK, for example, mechanisms operate which militate against such liberal goals being met. For example, the Research Assessment Exercise is an institution which creates incentives to hire one type of economist (Lee and Harley, **ref).** Moreover, other institutional pressures – including the training of most economists in mainstream theory and methods – mean that syllabuses tend to concentrate on the delivery of mainstream material and difficult critical questions are postponed indefinitely (see Sutton, 2000). Thus, although parallel perspectives are not inevitable, they become

[1] Clearly, if we abandon the assumption that teachers are neutral and objective, it is inevitable that they will subconsciously stress their own view and thereby influence students in their choices; but following Myrdal (1970) it is possible that, by informing the students of the teacher's own prejudice, the teacher can achieve greater objectivity.

desirable, because they increase the likelihood that the critical and comparative faculties of the student will be augmented.

Another argument for pluralism rests on two related arguments about the individual needs of students: that students have different learning styles, which dictates that a range of delivery and learning techniques be employed; and that students have different personal epistemologies, which will also affect the way they best obtain knowledge and understanding. Clarke and Clarke (1996) utilise Kolb's (1984) work on learning styles. Kolb held that individuals have different combinations of and preferences for of four modes of education: doing, thinking, watching and feeling. Thus, individuals benefit differentially from particular educational situations. Clarke and Clarke use this position specifically to argue again reliance on computer-based learning packages (they were assessing the *Winecon* package). However, the argument clearly applies to the reliance on any educational mode, model, or indeed methodology or theoretical position.

The personal epistemologies literature argues a related position (see Hofer, 2004a, 2004b, 2005; Stewart, 2005 for recent treatments). That literature has several key elements. First, it is held that students have 'folk epistemologies' and metacognitive individual theories about knowledge and knowing, often complex entities. Second, those personal epistemologies are situated in specific sociocultural (spatial and temporal) contexts. Third, the literature asserts that teachers also have epistemologies, and that mismatches between student and teacher can hamper the educational process. The implications of these arguments are that motivation will differ at different phases in the educational process. This raises difficulties for the teacher in helping the student develop. As Hofer (2004a: pp) notes, "[f]urthermore, it is possible that instructors are not necessarily explicit in their communication about epistemology, nor sensitive to the developmental level of their students". All of this makes educational a more complex process. Indeed, for Hofer (2004a: pp) "we need to know more about contextual influences, instructional practices, and how students interpret them epistemologically as they acculturate to new educational settings." The implications for pluralism from this literature are clear: no one style or method, or even body of knowledge can be guaranteed to be optimal. That licenses a range of approaches.

One of the key instrumental benefits of education – and one which has gained in prominence over many recent years – is the achievement in students of specific transferable skills. These skills include statistical, research, or IT skills, as well as competence in public speaking, presentation and writing. One such transferable skill, which, I argue, is particularly augmented via pluralism is the decision-making skills of the student. As Dow (1995) notes, under uncertainty, wherein there are no clear or at least incontestable procedures for action, there is a danger that agents become paralysed. There is a similar danger under pluralism. For example, if one imagines that 'anything goes' and that there are no checks on the theory, model, or model selection criteria chosen – admittedly a caricature of pluralism – this can license the belief that any action is permissible and as good as any other. However, if one takes a more practical view that some courses of action are better than others; or if we accept that in real life situations, decisions are either taken in groups or must be justified to groups, some mode of

justifiable decision-making, and thereby some examinable process of decision is necessary. Of course, it may be argued that the easiest way to achieve this is to adopt a single perspective from which no deviation is made. However, for a number of reasons – not least that a) no single method is likely to be superior all of the time; and b) other group members may have to be convinced of the proposed action – this monist approach is unfeasible. A pluralist approach is necessary. However, in an educational context, it can lead to the charge that students will become 'confused'. Indeed, when one is aware of all sides of an argument, it is confusing. However, such problems confront business and government every day. Thus, if we are concerned with employability and the creation of transferable skills, teaching students to deal with uncertainty and decide between a multiplicity of views and methods is essential.

Essentially, dealing with uncertainty and a range of available interpretations means that one needs to develop criteria for assessing competing narratives. Moreover, this assessment may not be the same in all contexts. One possibility is that, following Caldwell (1982, 1991) (and arguably drawing on Popper), one simply adopts a critical pluralist approach: that each perspective should be examined from the perspective of the alternatives to it. Or, one might choose criteria such as explanatory power, simplicity, elegance, practicality, or simply ask which position is shared by the most people. Under uncertainty, the evidence is unlikely to be definitive. In both those situations, what is required is 'judgement'. Dow (2004b) argues that a real world example of the use of judgement is in the Bank of England's Monetary Policy Committee (see Cobham, 2002, 2003 for supporting evidence of the importance of judgement in that process). Given that data may be incomplete, or subject to revision; and given that MPC members are faced with competing evidence and forecasts from different sources, a simple mechanical calculation is not possible. Thus, each MPC member must use his or her judgement to weigh up the relative importance of different pieces of evidence, and then reach a decision as to a forecast. This is also a reflexive process. It is clearly a difficult process in which to partake. Moreover, it is arguably more art than science. However, it is a valuable experience and process of learning for each participant. A similarly rich experience (albeit at a different level of significance and difficulty) is available to students, via teaching pluralistically.

Specific implications for ESD

The arguments presented above are general and philosophical in character, which could, in principle be applied to any academic problem. However, the specific case of ESD as a place for pluralism offers its own peculiar rationales for pluralism. Additionally, pluralism has specific applications to the question of ESD. The remainder of the paper will be devoted to this question.

The first case for pluralism in the context of ESD is that there is a myriad of definitions of SD. This problem is well established. Pezzey (1989) identifies fifty such definitions of SD (DeLucia, 2005). For example, there are definitions which explicitly break down SD into its component parts. There are others which focus more on development and thus the policy needed to achieve growth which is as high as possible under the constraint of

sustainability. Whereas, other definitions ignore development or remove it to focus on sustainability in an ecological sense. DeLucia (2005) emphasises sustainable consumption. Yet, further definitions focus on the social relations necessary for, and social implications of, SD (e.g. Costanza, 1991). One attempt to reach a consensus is the that put forward by the World Commission on Environment and Development, 1987: better known as the Bruntland Report. Bruntland stressed inter- and intra-generational equity, and the link between poverty and development, and defined sustainability as the requirement that basic needs must be met without compromising our ability to meet future needs. Key to the final point is that resources are not depleted or degraded so much that they are insufficient for future generations. This definition may seem straightforward and consensual, but that is not the case. Immediately, we are faced with the distinction between weak and strong sustainability. That distinction rests on whether or not human (technically human and human-created, physical) and natural capital are substitutable. Further, there are gradations of weak and strong depending on whether the substitutability between human and natural capital is perfect.

The usual inclination when faced with this range of contesting views is to try to remove it, usually by attempting to arrive at a single definition. For example, the ESD initiative in economics began with a questionnaire survey which first asked for reactions to the range of definitions of ESD. The purpose of this might to have been to find a common definition. However, the process of rationalisation to a single definition appears impossible. Efforts to establish a universal definition, for instance in the Bruntland approach, inevitably a) result in multi-part definitions, designed to encourage consensus, and yet, b) lose the richness of the original range. Rather, a strategy of deliberately preserving the range of definitions – and not merely as window-dressing early in the study, but as entities to be discussed in depth – may be advocated.

To return to the concepts of weak and strong sustainability, it should be stated that the two concepts contain a) fundamental agreement and b) fundamental disagreement. The fundamental agreement is that human, physical and natural capital can indeed all be categorised as capital. This is somewhat controversial in the light of the Cambridge controversies in the 1960s over the nature and existence of aggregate capital production functions and aggregate capital stock (see Harcourt, 1972). The pedagogical value of noting this dissenting view is manifold. First, students learn about the history of economic thought. Second, students are forced to consider a fundamental issue in economics, i.e., the nature of capital, a concept which typically they would have used previously without difficulty. Third, they might also ask why it is that the winning arguments are typically ignored. All of the above raise interesting questions and, in particular, encourage critical thinking.

The fundamental disagreement between weak and strong sustainability is that the latter holds that there are benefits which flow from natural capital which cannot be mimicked by human or human-created capital. This creates an imperative to maintain the natural capital and its ecosystem services. Two points can be raised from this argument which are pedagogically important. First, the opposition to complete substitutability forces students to confront critically key concepts in economics. Questioning substitutability

brings under scrutiny much of consumer and producer theory, general equilibrium and the concept of opportunity cost. This is valuable in terms of achieving critical thinking and thereby one of the aims of liberal education discussed above. Second, by considering the maintenance of natural capital as an *imperative*, an important philosophical question is raised. Economics is typically based on a philosophy of utilitarianism, wherein calculations are made according to aggregate utility: welfare analysis is based on this principle. In theory, any outcome is possible, contingent on individuals' actual utility at any one time. However, the idea of an imperative comes more from Kant. Thus, by considering seriously and in a little depth the concept of strong sustainability alongside weak sustainability, students' knowledge is increased, they are forced to think about the distinction and they must make a *choice* as to which version of sustainability they favour.

The distinction between weak and strong sustainability raises other fundamental questions. For example, strong sustainability often implies the precautionary principle, i.e. that "policies should…tak[e] steps to avoid outcomes that are damaging to health or the environment, especially when such outcomes are irreversible" (Harris, 2002: 451), even when scientific evidence is not clear on an issue. Two concepts are important here. First is the concept of irreversibility, which raises the question of how time is treated. Traditionally, economics has treated time as logical, i.e., it can be reversed, rather than as historical (Robinson, 1980). Recent work on lock-in, etc. have tried to redress this somewhat, however, textbook models of the economy remain locked in logical time. Again, then, the serious consideration of time can stimulate students. Second, the precautionary principle is usually predicated on the existence of uncertainty. Here, again, there is considerable scope for discussing a key concept in economics which is highly contestable. It has been long established that uncertainty can be of a probabilistic type – as is typically how it is treated in economics – or be non-probabilistic, in the Knightian or Keynesian sense. As Davidson (1982-3, *et passim*) has noted, there is a considerable difference between the two types in terms of their different economic implications. For example, Davidson (1978) argues that the existence of Keynesian uncertainty creates a demand for money as an asset for which there is no substitutability. Once again, a serious examination of concepts in SD had led to a core concept being discussed critically. The arguments for a critical pluralism based on liberal educational philosophy apply again. Further, the arguments for pluralism per se, referred to above, are relevant. Uncertainty in a fundamental sense is one of the justifications for pluralism.

Many of the above issues, in particular the existence of a range of definitions of key concepts in SD, can be boiled down to a distinction between two approaches to the study of economics and the environment: the distinction between so-called 'environmental economics' and 'ecological economics' (see, for example, Harris, 2002, for a textbook which presents the problems in this way). Whether or not one accepts the validity of these views, or even of this distinction, the split provides a valuable pedagogical tool with which to achieve the liberal aims of comparative and critical thinking. The distinction offers a readymade curriculum structure which could be applied to SD and to courses on the economics of the environment. Environmental economics can be characterised loosely as focusing on externalities, cost-benefit analysis, market failure, substitutability, and based on mainstream economic principles such as rationality, equilibrium, long-run

predictability, value-free analysis, individualism and an 'economy-first' approach. Whereas, ecological economics could be loosely characterised as holding that the first task for analysis is an understanding of the biosphere, a belief that systems rather than individuals are the key component of analysis, an acknowledgement of the pervasiveness of uncertainty and evolution, value-laden analysis, and thus the development of concepts like ecosystem services. By setting up the distinction between environmental economics and ecological economics at the outset of study, a range of issues can be addressed, including many of those discussed above. Crucially, the ecological approach is explicitly interdisciplinary, because it requires that we examine the functioning of the biosphere and construct our economics – from scratch if necessary – to fit it, rather than forcing the environment into readymade economic boxes.

Such an approach of teaching two views might be termed a "parallel perspectives" approach (see Clarke and Mearman, 2001). Such an approach explicitly licenses different theoretical and methodological approaches, because for example, ecological economics is more likely to advocate a qualitative approach, whereas environmental economics tends to favour formal and quantitative analysis. Methodological and philosophical questions cannot be dealt with and thrown away: theory and practice must involve considered metatheoretical discussion. These features have pedagogical benefits in terms of comparative and critical thinking. They may also have substantive benefits in that the students are better and more widely informed as well as being more methodologically aware. For example, students may be led, or preferably find their own ways, into bodies of theory of which they otherwise be ignorant. An example is on the question of valuation of ecological entities. In the environmental economics approach, entities are valued according to subjective utility measures, such as willingness to pay/accept and proxies such as travel costs. However, there are of course other methods of valuing the environment. At a simple but important level, the old distinction between use value and exchange value is useful in thinking about whether or not markets reach appropriate values for commodities.

Conclusions

This paper has examined pluralism and its justifications. Pluralism is appropriately a term with several definitions, but a working definition is that it constitutes the advocacy of multiple perspectives at theoretical, methodological and practical levels. Pluralism is justified from ontological, epistemological and pedagogical perspectives. There is no intention here to justify radical eclecticism, as associated with and advocated by postmodernists. Indeed, one of the pedagogical strengths of a pluralist approach is that it one can move beyond it, which may in the process improve the decision-making abilities of students. Thus, pluralism is often, to use Mäki's (1997) term, temporary. While it remains in place, though, pluralism has several benefits, beyond the fact that monism cannot in any case be sustained. It has, for example, been show to underpin a liberal approach to education, which seeks to develop the student in terms of their ability to think critically, comparatively and with an open mind. These benefits of pluralism have been applied briefly to the case of education for sustainable development. The paper has argued that by maintaining pluralism, and thereby suspending the point at which the

student must decide to hold one view or another, much of the richness of the SD literature is explicitly retained. Inevitably, such pluralism will come up against institutional resistance and constraints, notably time; but it is argued that by adopting pluralism, ESD can be delivered more effectively. Clearly, empirical work is necessary to evaluate these claims. Further, a pluralist, perhaps parallel perspectives approach, does require considerable planning. This issue should be investigated.

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