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Schooling and environmental education: contradictions in purpose and practice

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Introduction[1]

A number of authors have observed a pronounced discrepancy between the problem-solving and action-oriented goals associated with the contemporary philosophy of environmental education and an emphasis on the acquisition of environmental knowledge and awareness in school programs (Childress, 1978; Greenall, 1981; Maher, 1982; Robottom, 1982; Volk, *et al.*, 1984). Content analyses have revealed that curriculum materials commonly used for environmental education in Australia and the United States of America deviate from the rhetoric in a similar way (Robottom, 1983; Stevenson, 1984).

In this article I argue that this rhetoric–reality gap is to be expected given the traditional purpose and structure of schooling. A discussion of its historical development sets the contemporary concept of environmental education in the context of the political activism of the environmental movement. The socially critical and political action goals of environmental education are contrasted, first, with nature study and conservation education, and then with the uncritical role of schooling in maintaining the present social order. The need for students to engage in ideological and critical inquiry is indicated by an examination of the different ideologies which underlie proposals for environmental reform. Such educational ideals, however, conflict with

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the dominant practices in schools, which emphasise the passive assimilation and reproduction of simplistic factual knowledge and an unproblematic 'truth'. These practices are then explained by examining the structural organisation of schools, the primacy of demands on teachers to maintain order and control, and teachers' presuppositions about knowledge and teaching.

The historical context of the development of environmental education

The origins of environmental education can be traced, first, to the promotion of nature and outdoor study, essentially in primary schools, and later to the conservation movement. Nature study gained prominence through the school camps movement in Australia (Reid, 1980; Strom, 1980), rural studies in Britain (Wheeler, 1975) and the publication of Wilbur Jackman's *Nature Study for the Common Schools* in the United States of America in 1891 (Stapp, 1974). The primary purpose of nature study was—and still is—to develop an understanding and appreciation of the natural environment through first-hand observations. The conservation movement, which grew gradually during the first half of this century, introduced a concern for the preservation of species and areas of natural significance through sound management. This concern was expressed in moral and aesthetic terms by Aldo Leopold in *A Sand County Almanac* (1948) and in political (albeit conservative) terms by the formation of the International Union for the Conservation of Nature and Natural Resources. Historically, conservation education has concentrated on helping 'the public better understand the importance of natural resources to our society, and [developing] citizen support for natural resource management programs' (Stapp, 1974, p. 46).

Both of these movements were rooted in the liberal-progressive educational philosophies of, for example, Dewey, Rugg and Counts (Robottom, 1985) and had modest educational and environmental goals. Their social and political character reflected the middle class and the liberal democratic tradition that dominates western capitalist societies. In other words, neither nature study nor conservation education challenged the socio-economic or political fabric of our society. Reviews of school practices generally indicated that nature study's and conservation education's aims of developing knowledge, skills and awareness about natural resources and their management were fairly widely incorporated into primary school curricula and the science and geography curricula of secondary schools (United Nations Educational, Scientific and Cultural Organization, 1977 Childress, 1978).

Beginning with Rachel Carson's *Silent Spring* (1962), the 1960s brought warnings of imminent ecological disasters. Extensive media coverage of environmental issues, the publication of numerous books by ecologists, and the emergence of organisations such as Friends of the Earth and Zero Population Growth reflected a widespread concern in the late 1960s and early 1970s that action was needed to change the prevailing pattern of misuse of the environment.

Originally, this concern was part of a broader grass-roots movement which was centred on a desire for a lifestyle that emphasised the expression of both individuality

and community (as a reaction against conformity and isolation), and a quality of life based on non-materialistic values. The issues of civil rights (in the United States of America), student rights and military imperialism, as well as environmental exploitation, became the focus of a dramatic increase in political activism (in both sanctioned and disapprobated forms) by a significant minority of citizens throughout much of the industrialised Western world.

Although part of the social consciousness of this period reflected a concern for the disadvantaged status of racial and class minorities, the environmental movement throughout the Western world was criticised as 'the revolt of the *élite* and well-informed middle classes' who ignored the problems of the urban environment in which the majority of people lived (Wheeler, 1975, p. 14). In Australia and Britain, however, the working class did become involved to some extent, as a result of the impact on their lives of planning decisions intended to 'improve' the built environment (Wheeler, 1975). 'Green bans' on so-called urban renewal projects were instigated in Australia by trade unions, and bitter conflicts erupted in both countries over issues concerning places of considerably lower status than wilderness areas or historic buildings. Thus, for the first time the environmental movement expanded across class boundaries (at least in these two countries) and broadened understanding of the term 'environment' to include urban (or built), social, economic and political aspects as well as natural, historic and aesthetic elements.

Governments and institutions responded to these community concerns by, for example, establishing new government agencies with responsibility for monitoring and regulating the environmental impact of industry, inviting community participation in urban planning, and introducing university courses and departments in environmental management. At the international level the response included the involvement of the United Nations in developing a programme of action (e.g. conferences, reports, policy statements) to determine and promote the role of education in environmental improvement. In this context a third and more radical phase of development, now termed 'environmental education', evolved with a new philosophy which embodied a commitment to activism.

Ideological conflicts within the environmental movement

While there was consensus within the environmental movement concerning the symptoms of environmental degradation, the underlying causes and the means of averting further catastrophe were—and remain—in dispute even among professional ecologists. Major blame has been attributed variously to population growth, modern industrial technology, the capitalist economic system, economic growth and an affluent consumer society in which materialistic values predominate (Attfield, 1983). As revealed by the debate between representatives of industrial and developing countries at the 1972 United Nations Conference on the Human Environment in Stockholm, explanations of and proposed solutions to our environmental problems can represent ideologies which have particular social and political agendas. For example, countries which do not wish to disturb their current pattern of resource use are seeking to main-

tain (either consciously or unconsciously) the existing social and economic order. On the other hand, developing countries arguing for a more equitable distribution of resources want to transform the present arrangement of global economic and political power.

A number of typologies (for example, Enzensberger, 1974; Huckle, 1983; Fox, 1984; Devall & Sessions, 1985) have been constructed to illuminate the ideologies underlying different visions of and means to environmental improvement. Although these typologies often distinguish different emphases on a number of dimensions, one common and critical dimension is the political scenario through which environmental reform is to be enacted. Essentially, one of two broad scenarios is embraced (if not explicitly, at least implicitly), with two variations on the type of approach adopted within each:[2]

1 Conservative reform (within the present system)
   (a) The *technical approach* is concerned with developing 'quick technological fixes' of environmental conflicts (Enzensberger, 1974) by injecting ecological principles and information into existing decision-making structures. Its adherents believe that scientific and technological expertise can provide the basis for resolving quality-of-life issues without the need for social and economic changes (O'Riordan, 1981). In this approach there is no place for non-professional or citizen participation in environmental planning
   (b) The *political approach* involves working within the present political system to reduce the impact of human activity on the environment. These reformers foresee a need for improving legal, political, economic and technological decision making, but without addressing the structure of our social and economic institutions. Typical concerns are the preservation of open space and wilderness areas and the siting of undesirable development projects (such as airports, freeways and factories): in other words, issues that impinge on the quality of life of the middle class who have the clout to use the conventional political process effectively.

Both the technical and the political approaches, partly by supporting the primacy of economic growth, tend to maintain the status quo rather than transform the economic and political order.

2 Radical reform (of the present system)
   (a) The *socially critical approach* treats environmental crises as symptoms of a larger problem in our society (Huckle, 1983)—namely, the dominant role of economic considerations and the unequal distribution of resources. Radical reformers regard major economic reorganisation as the only way to rectify violations of both environmental quality and social justice. Most Marxists and neo-Marxists attribute the problem to capitalism (i.e. private ownership of the mode of production), while others point out the equally serious nature of environmental destruction in socialist countries (Enzensberger, 1974). Disagreement on the means of reform tends to be

accompanied by the lack of a clear vision of an alternative economic and political system.

(b) The *alternative approach* rejects traditional forms of society and advocates a virtually pre-industrial lifestyle involving a closer relationship with nature in small, self-sufficient (usually rural) communities. This utopian alternative, which is presently feasible for very few people, includes reliance on soft or low-impact technologies. 'Deep' ecologists or environmentalists, who emphasise the intrinsic (rather than instrumental) value of all of nature, often are included in this category (Huckle, 1983). However, many deep ecologists combine the cultivation of a personal environmental ethic with political activism by addressing public policy through the vehicle of the Green Party (Devall & Sessions, 1985). In this latter respect they have more in common with the socially critical reformers, but with less concern for social inequalities.

Both socially critical and alternative reformers argue that economic growth should be a subsidiary consideration to environmental quality. However, socially critical environmentalists see the alternative group as politically naive and retreatist since 'their idealism meets the socio-psychological needs of a disillusioned middle class whose environment is threatened for the first time in history, but is largely irrelevant to the vast majority which has far more pressing concerns' (Huckle, 1983, p. 103).

Contemporary goals of environmental education

The different ideologies associated with the environmental movement have two important implications for education. By revealing the existence of substantively different perspectives of the root causes of environmental problems and of the appropriate means to effecting change, the implication is that students should examine all perspectives and judge their respective merits. Several writers (Huckle, 1983; Maher, 1986), in contending that only (what I have termed) the socially critical approach to radical reform is consistent with the goals and principles of contemporary environmental education, have implied that teachers and students should be concerned with this ideological position only. I would argue that to be consistent with democratic principles students should be exposed to the plurality of environmental ideologies, and that through a process of inquiry, critique and reflection they can be assisted to develop and defend their own set of environmental beliefs and values. After engaging in this rational process of social inquiry and moral deliberation, it should be each student's choice to pursue actions deemed necessary and justifiable for achieving environmental reform in accordance with the ideological position he or she supports. But students also need to be competent to implement or act on their choice, otherwise they will not consider themselves capable of rectifying environmental injustices, and therefore will not experience an authentic choice on these issues (Newmann, 1975). In other words, without the ability to act on their choice, they in effect have no choice.

The development of this competence leads to the second implication. The ideologies illustrate that environmental reform is political (no position is politically or socially neutral). Therefore, if students are to be capable of acting on their choices and influencing environmental decision making, then environmental education must incorporate the development of students' knowledge of the political-legal process and skills in political advocacy. As well as examining the formal and informal processes of decision making in the political-legal system, students should be encouraged to analyse the various forms of political participation so that they can rationally justify the strategies for action which will employ their advocacy skills (Newmann *et al.*, 1977).

These implications are consistent with the environmental education process, as enunciated in the contemporary rhetoric. The goals of environmental education include the intellectual tasks of critical appraisal of environmental (and political) situations and the formulation of a moral code concerning such issues, as well as the development of a commitment to act on one's values by providing opportunities to participate actively in environmental improvement. The influential and widely accepted policy statements that emerged from the international conferences at Belgrade in 1975 and Tbilisi in 1977 established a clear consensus on this point. For example, in addition to prescribing the development of critical thinking and problem-solving and decision-making skills in the context of quality-of-life issues, the Tbilisi Declaration emphasised that students should 'be actively involved at all levels in working toward resolution of environmental problems' (Tbilisi Declaration, 1978, p. 18).

While the goals of nature study and conservation education could be relatively easily accommodated in the goals and structural organisation of schools, this more recent critical and action orientation of environmental education creates a far more challenging task for schools. To assess the nature, extent and causes of this challenge we need to examine the purpose and practice of schooling.

The social and cultural purpose of schooling

Schools as we know them today evolved in the early nineteenth century as institutions for mass education. Their intended purpose, according to Dewey, was to transmit basic knowledge and the skills of reading, writing and arithmetic, as well as to convey a broad understanding of society and the student's role in it (Schrag, 1988). In other words, schools, and hence classrooms, were structured to present basic information, to enable the practice of routine skills, and to maintain existing social conditions and relations. Given the universality and stability of their structural organisation over almost two centuries, it seems that schools in the form of classrooms generally are efficient in meeting the above purpose (Schrag, 1988).

Historically then, schools were not intended to develop critical thinkers, social inquirers and problem solvers, or active participants in environmental and political (or even educational) decision making. Put simply, their intended function was not to promote social change or reconstruction.

Educational sociologists have described the contemporary role of schools as still primarily concerned with the transmission of cultural knowledge, skills and values. But modern industrialised societies, with their specialised division of labour creating social stratification, contain a plurality of cultures and subcultures, each of which possesses unique knowledge and values. Therefore, compulsory public schooling is faced with choices in defining the culture it is to transmit. These choices ultimately reflect the 'mainstream' or dominant beliefs, values and norms shared by those who have political power in our society (Apple, 1979; Lundgren, 1981; Popkewitz, 1983). And one of the dominant beliefs is that the role of schools should include credentialling students with respect to their ability to demonstrate mastery of 'valued' knowledge and skills. Students' assessed performance then becomes a significant determinant of their life chances and economic well-being. The well-known consequence of this credentialling role is that the participants see the 'real' purpose of schooling as the pursuit of individual academic achievements. Schools thereby convey norms of individualism, competition, achievement and independence: norms that prevail in the dominant culture and maintain the existing structure of society. Hence, as Durkheim (1956) argued, one role of schooling is to foster and perpetuate social stability. In this respect, schooling also contributes, along with other social institutions, to the reproduction of social and economic inequalities (on the basis of class, race and gender) in society, since some groups have less experience of and more limited access to culturally valued forms of knowledge (Apple, 1982).

The rhetoric of environmental education, on the other hand, focuses on improving the quality of life of all humankind on our planet by finding 'ways to ensure that no nation should grow or develop at the expense of another nation and that the consumption of no individual should be increased at the expense of other individuals' (Belgrade Charter in Fensham, 1976, p. 24). Several key aspirations are embedded in this statement. First, environmental education is concerned not only with social reconstruction to alleviate exploitation of the environment, but also with the avoidance of social injustices in the process of that reconstruction. Second, ecological harmony and social justice suggest the need for an interdependent community (at both global and local levels), rather than the liberal, capitalist notion of a community of free or autonomous individuals without collective responsibility (which may demand forgoing certain individual interests). Invariably, both tasks undermine social stability by creating conflict, since they challenge dominant interests and different value systems.

Contemporary environmental education, therefore, has the revolutionary purpose of transforming the values that underlie our decision making, from the present ones which aid and abet environmental (and human) degradation to those which support a sustainable planet in which all people live with equal human dignity (Tanner, 1974). This contrasts with the traditional purpose of schools, as described above, of conserving the existing social order by reproducing the norms and values that currently dominate environmental decision making. Therein lies the first major contradiction between environmental education and schooling.

Curriculum and pedagogical practices

The guiding principles (Tbilisi Declaration, 1978) and key characteristics (Fensham, 1979) of environmental education establish particular kinds of curriculum and pedagogical practices as being necessary to achieve the stated goals. They focus on learners working individually and collectively towards the resolution of current environmental problems. The particular problems should, of course, be appropriate to students' cognitive and experiential development and can range from small-scale, local concerns (e.g. trail bike use in a wildlife reserve) to major global issues (e.g. desertification). Teaching and learning are intended to be co-operative processes of inquiry into and action on real environmental issues. Such an inquiry process demands that students actively engage in critical or complex thinking about real problems. The development of knowledge, skills and values is not only directed towards action, but emerges in the context of preparing for (i.e. the inquiry) and taking action. Consequently, curriculum and pedagogical planning need to be highly flexible. For example, as well as adapting to students' own social constructs, the teacher should be amenable to students' decisions in relation to both their learning and their actions.

In contrast, numerous studies have indicated that there is one consistent, and markedly different, pattern to the curriculum and pedagogical practices to be found in the majority of classrooms (e.g. Bellack, *et al.*, 1966; Barnes, 1969, 1976; Cusick, 1977; Everhart, 1983; Goodlad, 1984; Sizer, 1984). The common curriculum emphasis can be described as the mastery of many fragmented facts, concepts and simple generalisations organised loosely within discrete bodies or fields of study. The predominant pedagogical process involves the teacher as dispenser of factual knowledge. Official student participation is usually limited to making short oral (or, less frequently, written) responses to teacher questions which elicit 'largely recitation of information already defined by the teacher or textbook' (Young, 1980, p. 68). The teacher is frequently the only participant who actively engages in higher order thinking processes, such as the critical analysis of explanations and arguments and the making of value judgements. Characteristically, student thinking is confined to applying factual information to familiar 'well-structured' problems: that is, problems with unambiguous definitions and goals, and a single correct solution which has already been determined (Simon, 1973). Beyond such relatively simple application, knowledge is acquired individually for future use (i.e. in later life). The test of students' thinking occurs in private artificial situations (i.e. written examinations) on theoretical material which is usually far removed from the realm of the students' present or future life experiences.

These contrasting practices suggest an extensive list of curriculum and pedagogical contradictions between environmental education and schooling. While an environmental education curriculum should be interdisciplinary and focus on real practical problems, school curricula are discipline-based and emphasise abstract theoretical problems. Whereas a curriculum in environmental education is emergent and problematic in that the content arises as students are involved in specific environmental

problems, most school curricula are predefined since they are designed to serve predetermined behaviourally specific ends (that is, ends whose attainment can be readily assessed). Similarly, pedagogy in environmental education ought to be problematic in the sense that the way for students (and teachers) to solve environmental problems is uncertain, in contrast to the unproblematic pedagogy of information dissemination which results from instructional means being clearly defined by the criterion of the efficient achievement of the desired ends (Kliebard, 1977). A function of knowledge in environmental education is immediate use for the social value of a sustainable and emancipated quality of life, which conflicts with the major function of school knowledge as storage for future use and the enhancement of individual status and economic well-being. While environmental education advocates learning that is holistic and co-operative, school learning tends to be atomistic and individual. In environmental education rhetoric students are active thinkers and generators of knowledge, but in schools students are usually in the passive position of spectators and recipients of other people's knowledge and thinking. Instead of learning and action proceeding hand in hand, the acquisition of knowledge precedes its application (Fensham, 1979). Finally, the mastery of relevant knowledge and skills is demonstrated in environmental education by students' actions in real situations (that is, their performance in exerting influence on environmental decision making), not by students writing about theory in artificial situations (that is, their performance in 'influencing' the teacher).

An understanding of the predominance of the practices outlined, apparently throughout most of the world, and the contradictions they create with the goals of environmental education can be gained by examining, first, the structural organisation of schools and, second, the professional ideologies that underlie teachers' organisation and transmission of knowledge.

School organisation and the need for order

As already described, historically schools have been designed for the mass processing and credentialling (and, some would add, the child minding) of children and adolescents. They require one adult to interact all day in a confined space with one (in primary schools) or several different (in secondary schools) large group(s) of students whose attendance is coerced. Teachers' work with these groups is defined, to a large extent, by the demands of an assessment system which measures students' mastery of a broad range of standardised content (so that the academic performance of students across the state or country can be compared). Therefore, to be regarded as an effective teacher (by the majority of school authorities, colleagues, parents and students, as well as even oneself), the efficient coverage of material is necessary. Together, the organisational conditions and the demand for covering material compel teachers to be concerned, first and foremost, with maintaining order and control in their classrooms.

This concern is most obviously manifested in the many classrooms where teachers agree to make minimal demands of their students in exchange for their compliant

behaviour (McNeil, 1983; Powell *et al.*, 1985; Sedlak, *et al.*, 1986). Yet even the dominance of teacher talk can be attributed not only to the desire to dispense information, but also to the control of classroom interaction which it facilitates (Schrag, 1988). Further evidence of the frequent subordination of educational goals to social control comes from observations of teachers who immediately decrease the degree of difficulty and increase the amount of structure of classroom tasks when confronted with management problems (Doyle, 1983).

Consequently, for many teachers a major criterion in deciding on pedagogical strategies and in selecting student tasks is that they are unlikely to create control problems. And highly structured tasks which are unambiguous and have single correct answers or solutions (such as the mechanistic application of algorithms or other given information) tend to meet this criterion. Such tasks fulfil two other essential criteria for teachers: ease of marking and grading (which is an important consideration, especially for secondary teachers who often have well over a hundred students) and, more significantly, ease of justifying the grading to both students and parents (Schrag, 1988). Given the school's role in credentialling students and determining their future opportunities by means of competitive grading and ranking, pressures are placed on teachers and school administrators to use an assessment system which is perceived to be fair and objective. Only a system which is readily understood and accepted by the majority of students and parents is likely to be so perceived. Teachers face much greater difficulty in convincing students of the fairness of grading criteria when they assign 'ill-structured' problems, which are characterised by ambiguous definition and indeterminate criteria, for solution (Simon, 1973). As a result, assessment systems emphasise the mastery of selected fragments of knowledge and skills developed by well-structured tasks. And technically, of course, it is easier to test for such knowledge and skills.

Additional advantages of the type of learning tasks that dominate students' work in schools are their sole reliance on the teacher as a knowledge source and the short blocks of time in which they can be completed. The former negates any need for students to have access to environments and resources beyond the classroom, and the latter is highly compatible with the time schedule (i.e. approximately forty-five-minute blocks) on which secondary schools function. The task of solving environmental problems, however, is not amenable to these space and time restrictions. Students need the time and freedom, for example, to visit the site of environmental conflicts and to consult local citizens, experts and libraries.

Compared with the typical school tasks, engaging students in problematic inquiry, as demanded by the goals and principles of environmental education, is a far more risky endeavour in terms of maintaining order and control. The complex problem-solving and critical thinking involved in such inquiry demand of students considerable tolerance for ambiguity and uncertainty, autonomy for making judgements, and the confidence and insight to challenge conventional wisdom (Newmann, 1987). In addition to being intellectually demanding, this kind of work is not appealing to many students (or adults), because it does not provide them with any immediate feeling of satisfaction or accomplishment:

> Even in the most supportive settings, humans have great difficulty subjecting their own beliefs to continuous scrutiny, difficulty in resolving ambiguity and contradiction, difficulty in sustaining interest in abstract issues of social justice, especially when criticism highlights negative features in the human condition. (Newmann, 1985, p.11)

Difficulty, ambiguity, contradiction, autonomy, and cognitive and psychological uneasiness suggest a recipe for classroom disorder rather than classroom order. If critical inquiry into and analysis of environmental situations, and the development and implementation of action strategies, were accompanied by continuous, constructive and lengthy dialogue with students, often on a one-to-one basis, then students might cope with the above characteristics. Obviously, however, the organisational conditions (class size, teacher load, time schedule, and so on.) in virtually all schools are not conducive to such intensive and personalised dialogue.

Given the organisational constraints outlined, it is not surprising that teachers fail to engage students in critical and reflective analyses of environmental issues. Their need to maintain order and award grades on a competitive and objectively perceived basis evokes an avoidance of controversy and critique and instead encourages an emphasis on knowledge which represents consensus and certainty rather than conflict and ambiguity.

Teachers' curriculum and pedagogical ideologies

Besides the organisational pressures, teachers' views about knowledge and teaching (that is, their epistemological and pedagogical beliefs) are likely to influence what form of knowledge is selected and how that knowledge is then organised and transmitted in the classroom (Young, 1981). In order to analyse the significance of this process it is necessary to first discuss the different forms of knowledge and ways of knowing.

Esland (1971) has described two forms of knowledge that underlie the pedagogical process. In one, knowledge is characterised as discrete, empirically tested and objective (i.e. value free). This form of knowledge is also measurable by 'explicit and public criteria' (Popkewitz *et al.*, 1982). The other form is more subjective, problematic and essentially personal in nature, being socially constructed from the learner's active participation in the production and verification of meaning. These different conceptions of knowledge are analogous to two of Habermas's (1971) areas of cognitive interest or assumptions about what constitutes legitimate knowledge—namely, the technical and the practical. The technical way of knowing results from objective inquiry associated with the empirical-analytic sciences and is intended to serve the human activity of work, leading in modern technological societies to the professionalisation and compartmentalisation of (scientific) knowledge in specialist disciplines. The practical way of knowing, according to Habermas, emerges from the historical-hermeneutic sciences which are concerned with generating knowledge in order to interpret communicative or social interactional experience.

Given the above distinction and language, the dominant conception of knowledge in schools can be categorised as authoritative, objective, discipline-centred and

technical. The prevalence of this form of knowledge has been attributed to: (1) teachers' (often subconscious) presupposition (Robottom, 1982) that it is the only—or at least the only legitimate—type (usually a result of their own educational experiences); (2) the process of teacher socialisation whereby professional competence is defined by one's mastery of a subject (for secondary teachers) or by one's pedagogical expertise within a traditional curriculum and instructional system (for primary teachers); and (3) the effect of numerous messages conveyed by society that it has the highest status (Young, 1971). In any case, the school's role of 'objectively' assessing and credentialling individuals provides a powerful pressure to acknowledge only this epistemological position.

Exclusive adherence to the objective view of knowledge supports the concern for maintaining classroom order. It enables the teacher to exercise cognitive authority by owning and controlling the confirmation and disconfirmation of classroom knowledge, as evidenced by teachers' transformation of student discourse into the language of formal knowledge (Young, 1980). In this way the teacher can control course content and the communication process in the classroom, especially when the recitation method is supported with highly structured materials (usually texts) which enable the 'teacher to specify the activity that each pupil should be engaging in at any one time' (Young, 1980, p. 63). The more personal, subjective and practical knowledge form creates a place for commonsense knowledge acquired from everyday experience and therefore, by recognising their epistemological system (Everhart, 1983), transfers some cognitive control to students. This transfer makes the direction of student participation more unpredictable and thereby renders the teacher's social control more problematic.

Bernstein (1975) has argued that teachers' pedagogical approaches are related to their approaches to curriculum organisation and student assessment, as well as to their desired degree of control of classroom processes. His theory predicts that in a subject-centred curriculum, pedagogy will focus on the acquisition of concepts and ideas associated with distinct disciplines and assessment will use explicit subject-derived criteria to measure students' degree of mastery of pre-specified knowledge and skills. A problem-centred or interdisciplinary curriculum, as entailed in environmental education, creates problems for teachers in curriculum organisation, pedagogical control (i.e. in demarcating the place of students' personal knowledge as described above), and the assessment of student learning (i.e. alternative criteria and modes of evaluation have to be derived) (Bernstein, 1975).

Strong support for Bernstein's theory is provided by a study of 152 teachers in five Australian secondary schools, which found a significant correlation between teachers' beliefs in a subject-centred curriculum, a competitive and 'objective' assessment process, and a high degree of control over classroom interactions (Young, 1981). The study also revealed that this profile of teacher ideology was associated with an objectivist view of knowledge. Consequently, the author concluded that 'teachers' epistemologies are an important part of their pedagogical ideologies and are therefore likely to be involved in the shaping of teachers' pedagogical practices' (Young, 1981, p. 204).

The nature of current school curriculum, therefore, can be related to teachers' professional ideologies and the 'institutionalisation of dominant beliefs about knowledge, teaching and learning' (McIntyre, 1985, p. 79). The significance of the latter effect was recognised at the Tbilisi international conference when a research need in environmental education was identified as 'determining the obstacles (epistemological, cultural or social) restricting access to educational messages and their utilization' (Tbilisi Declaration, 1978, p. 28).

Introducing environmental education into a school challenges the dominant conception, organisation and transmission of knowledge, creating for most teachers a conflict with their approach to teaching and learning (Esland, 1971). Treating knowledge and its transmission as problematic creates a new definition of the role of the teacher and demands changes in the organisational conditions under which teachers generally work. If environmental education in its contemporary form is ever to become a reality in schools, then these two issues must seriously be addressed.

Notes

1. I am grateful to Fred Newmann, Joe Onosko, Tom Popkewitz and Fran Schrag for their thoughtful comments on an earlier draft of this article.
2. This typology represents an adaption of the work of Enzensberger (1974), in particular, and Huckle (1983).

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