

Holding Up a Mirror - harnessing the reflective potential of Environmental Education

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Abstract

Two premises underlie this paper: firstly, that the environment, unarguably a current, contentious, and global area of concern, is representative of many social problems; and secondly that a society reveals its approach to such problems in its philosophies and methods of education. A recent doctoral study proposes that Environmental Education (EE), as the synthesis of these areas, therefore provides a valuable tool with which to examine not just environmental but wider developmental and social issues. The application of such a methodology, within a comparative education context, proved to be conceptually challenging but was ultimately tremendously successful, enabling insights into many other spheres of human activity. Conclusions relating to future directions in educational research are twofold: 1) that current isolationist perspectives must make way for new transversal approaches; 2) that a broadening of the comparative education methodology can yield deep insights outside of the educational sphere.

It is idle to expect any great advancement in science¹ from the superinducing and engrafting of new things upon old. We must begin anew from the very foundations, unless we would revolve forever in a circle with mean and contemptible progress. (Francis Bacon, 1620 *Novum Organum* Aphorism XXXI)

What is needed now, arguably, is a 'third way' ...an approach to comparative education which is in tune with the more general efforts to reconceptualise social science to reflect the realities of life in the 21st century. (Patricia Broadfoot, 2000 *Comparative Education for the 21st Century*)

It is incontestable that change has always, and will always occur; 'by cosmic rule... all things change'². However, not all change is necessary or beneficial. People meet the challenge of change with varying degrees of hostility or acceptance, and this change may be radical or incremental. Over 350 years ago, Francis Bacon commented on the nature of addressing change, suggesting that it was not enough to merely 'engraft' new things upon old. Given the

urgent need for change in many fields, we find ourselves in a parallel situation, having to ask how change occurs and how it can be effected for the greatest benefit. For with all our access to information, money, innovation, and education we are still no closer to the resolution of many of our problems. Many would say that they are worsening. We are a fragmentary society with a deteriorating physical environment and social fibre. The question therefore is pressing; why are changes, beneficial to and desired by the majority, so difficult to achieve and, moreover, to sustain? My most recent research arrived at the conclusion that it was not the changes themselves, nor the people attempting to implement them, that have hindered progress. Rather, it is the nature of the supporting institutions, the language we have available to us, and out-dated notions of development that largely bear responsibility. A major requirement for the transformation of these areas is that *isolationist* perspectives make way for more *transversal* approaches. The conclusions have obvious implications for the future of research itself, in both the way it is conducted and its dissemination. Foregrounding my use of Environmental Education (EE) and Comparative Education (CE) as an approach to examining social phenomena has resulted in a new methodology of change. This implies a movement away from traditional forms and limitations, towards new conceptions of education and educational research.

"The Need for Change"

The doctoral study, entitled *The Need for Change: Institutional, Developmental and Linguistic Imperatives - Lessons from Environmental Education in Brazil and Australia*, came to various conclusions relating to the primary impediments to change in the three titular areas. In order to identify these impediments, and examine the problems and solutions of a particular society, decisions relating to EE were analysed in the Brazilian and Australian contexts. EE was identified as the synthesis of environment - a current, contentious, and global area of concern, and one which is representative of many current social problems - and education - believed to mirror social interactions generally and to be representative of the choices and priorities society makes for the future. EE, as an educational and social movement requiring interdisciplinary attention, reflects environmental, developmental, and social concerns. The interaction of EE with social and developmental structures therefore epitomises important issues in these areas. EE (along with environmental, educational, and developmental discourses) was ultimately used to show inadequacies in existing structures and gain insights into the elements inhibiting the adoption of alternative approaches in this context. These insights enabled extrapolation from the specific arena of environment and education to other spheres of action.

There were two further reasons for using EE as the basis of the study. The first, and perhaps most obvious, of these is the current global relevance of both environmental and educational issues. Many environmental problems cross national boundaries, and international censure from both International Organisations (IOs) and individual nations for environmentally unsound behaviour has increased substantially. This international condemnation is due largely to improved public access to information via communication technology and the focusing of attention on environmental issues through large numbers of international environmental conferences in the latter part of the twentieth century. Consequently, public concern and awareness have risen and this in turn has brought national governments under pressure to address these issues. Such increased national accountability has brought with it the necessity for both regional and international negotiations in the environmental arena. Education is also undergoing a 'global revolution' and is increasingly being touted as the solution to various problems. A cursory glance at virtually any curriculum will show a plethora of educational programs designed to combat a variety of social (and global)

concerns³. While education cannot be the panacea for all world ills, it is a vital component in any transformation attempts.

The second reason for using EE is more local in focus. The nature of EE necessarily requires that the individual characteristics of nations and communities be taken into consideration, as well as the ways they manage decisions related to the environment, development, and education. There are many factors that influence decision-making processes related to EE. In particular there are strong links between the political decisions of a particular country and its culture, history, social realities, and styles of development. Given the differences that exist between countries in these areas, the question arises as to how a country takes on international decisions and reconciles them with its own national agenda, and how this is then interpreted by individuals and localities. Central to this question is the nature of the incorporating structures and institutions, and whether they are appropriate for the inclusion of EE and environmental issues generally. EE synthesises issues surrounding environment and education at many levels. The examination of EE methods, theories and philosophies, and the extent to which these have been able to be maintained within supporting structures, highlighted various impediments to the aims of EE and to addressing the need for change in general.

In order to provide perspectives from global to local the study focused on the EE initiatives of two particular nations - Brazil and Australia. These cases emphasised the tensions embedded within environmental, developmental, and social issues and assisted in determining ways of achieving alternative solutions. Issues relating to the philosophy of education, inter-national relations, globalisation, and sustainable development, among others, all contributed to an understanding of the nature of institutions and national decision-making. It became clear in this analysis that traditional institutional structures, models of development, and 'North-South' style linguistic dichotomies were three of the main features requiring reconstruction and reconceptualisation. The analysis of these areas demonstrated that existing power structures are inadequate and that changes in each are required, necessitating new approaches. A further examination of how EE aims could best be achieved revealed what these approaches may consist of.

This methodology of course included the collection of information through such sources as literature, policy documents, and interviews, with their attendant difficulties. However, the underlying methodological framework remained the scrutiny of EE within a comparative context and the analysis of the resultant observations. The subsequent examination of this framework has led to similar innovatory conclusions, relating to educational methodology in general and CE in particular, requiring radical change along the three original axes. Emerging concerns include: the development of comparative methodology; the application of a predominantly 'marxist'⁴ research perspective, as contrasted with a more pragmatic approach; movement towards more transversal and inclusive methods; and the potential scope of educational research. A final note discusses age-old impediments to change.

Concerning Comparison

There is a significant body of literature relating to comparative education, advancing different reasons for the value of comparing systems, and which systems are the most beneficial to compare. Most often these are related to national studies focusing on learning about other cultures, establishing generalised principles of education, providing models of good (or bad) practice to policy-makers, and solving national education problems (primarily within developing nations). More recently there has been agreement among some comparativists that CE could be more widely applied. This was made abundantly clear in the August 2000

edition of *Comparative Education*, which was devoted to new directions in the field. Some of these included:

- links to development education (Little);
- interactions between theory and practice, micro and macro levels of analysis, North and South (Crossley);
- multi-disciplinary perspectives (Crossley, Broadfoot);
- attention to lifelong learning (King);
- the significance of culture in educational processes (Grant); and
- the reassessment of what constitutes education (Broadfoot).

The scope of my doctoral study required all of these, as well as an element which would link education with other social endeavours, and thus follows "a long tradition of writers in comparative education who have put before us the need to contribute to solving... 'the great problems of our epoch'" (Price *in* Burns & Welch, 1992: 70). The environment, and its related 'developmental injustices', is one of these "great problems". It made sense, therefore, to combine EE and CE with a view to examining general social relations. Price consequently asks the pivotal question,

...how can we establish a genuinely democratic, co-operative society which would finally eliminate the absurdity of poverty in the midst of plenty ... and solve the ecological crisis: the threats of soil depletion, water poisoning, destruction of the ozone layer, loss of genetic variety and the like (ibid: 71).

This is exactly the question that EE has before it, making EE in a comparative context an ideal framework with which to respond to the "great problems".

Often educational comparisons are still made at a specific level of schooling. Consequently, uses of comparative education for purposes of improving national education systems are abundant, and the influence of political, economic, and cultural systems on education has also been acknowledged, with national comparison dominating. Others have identified the importance of subnational comparison (Fry & Kempner, 1996), while Halls (1987) suggests a range of other bases for comparison such as world-system, North-South relations, and thematic. However, studies of education (especially in its non-formal manifestations) have seldom been examined with the aim of drawing wider social conclusions, and there is little reference to this type of research providing insights into other aspects of national life and inter-national relations. It seems that educational research has always been used specifically to seek educational solutions. Even when in relation to solving social ills (see Price *in* Burns & Welch, 1992 for example), the conclusions remain in the realm of promoting education for specific causes (drugs, sex, multiculturalism, and so on) and rarely for broader social conclusions. The integrated nature of the environment makes it difficult to settle on any one comparative paradigm as a guiding methodological philosophy, as elements of all theories can be readily applied to the environmental context. Focusing on EE resolved this issue and demonstrated, not only that the units for comparison are potentially limitless, but also that there is bi-directional feedback between education (in its widest sense) and society. That is, as education responds to its social context there are reflective possibilities in educational research. In speaking of popular education, Brazilian educationalist Paulo Freire reminds us,

Education does not exist outside of human society and human beings do not exist in a vacuum⁵. (Freire, 1996: 43)

The international dimension of environmental issues, documents, politics, and EE has been widely examined in scholarly literature in order to ascertain the role that global-level institutions and organisations have in establishing broad reaching EE principles. Also in

great supply is literature relating to national environmental and EE policy, as well as their educational implications. However, the oft stated integrated and interdisciplinary nature of EE within this literature has not been translated into corresponding environmental, political, or educational action. Environmental negotiations have increased in scope and importance, acknowledging the important role of inter-national relations. The environmental theme, therefore, has international, national, and local dimensions, as well as strong links with economic, social, political, and cultural systems. While current conceptions of international interdependence are widely accepted and acted upon by the global community, and international institutions and governance structures are increasingly acknowledged, cooperation on an international scale is still often guided by economic considerations. EE is an ideal medium with which to study these areas as the process of implementation has already begun and it is embedded in a powerful ideology. Environmental objectives imply certain methods for their resolution. The transboundary nature of environmental problems for example, requires a similarly interdisciplinary structure within EE. By looking at EE, insights can be gained into how these objectives can be translated into integrated methods and structures that facilitate implementation.

The global reach of environmental problems demands an international framework for examination. The *world-systems analysis* of education, as proposed by Robert Arnove, "restores the international dimension to the field of comparative and international education... [and] helps explain... why externally induced educational innovations may contribute to perpetuation of existing stratification systems within and between countries" :62; Cf. Illich, 1969⁶). Central elements within the world-system analysis include; "economic and cultural dependency, center (sic) and periphery, convergence and divergence in the international order" :49). These ideas have obvious links to EE, CE, and the general notion of change, and is therefore particularly relevant in the context of this study. More recently, Clayton (1998) has taken up world-systems theory with specific relation to comparative education. His analysis makes the distinction between 'economic determinism' and 'ideological determinism', and suggests that subordinate parties in core-periphery relationships make informed responses to the dominant hegemony, ranging from "overt resistance" to "pragmatic acceptance" (Clayton, 1998:494). The former challenges the status quo and attempts to break down many taken-for-granted assumptions. For CE in particular, on a national level this means reconceptualising the developed-developing dichotomy, while more locally a shift in focus from school and pedagogy to youth and education is needed, with groups outside of the school community placed in the foreground (Broadfoot, 2000; Springer, 2000; Price *in* Burns & Welch, 1992:74). The latter, however, accepts power relations, categories and systems as absolute and, while not unquestioning, believes that change can only occur from within these structures. Either way, Clayton believes that these are distinct choices that are made by active protagonists. This is a prime example of a more general phenomenon in which we find 'marxism' and 'pragmatism' at opposing ends of an ideological spectrum.

The Pragmatic Present

In the field of EE there are a range of positions on the best way to include environmental considerations into educational structures. At one extreme is the pragmatist. This position is common throughout EE discourses, and especially within government policy, and asserts that the only way that EE can be implemented is to incorporate it within "existing structures" . However, this cannot constitute effective implementation, when such supporting structures continue to sustain isolated and fragmentary action within a rigid and traditional scientific framework. The mere implementation of EE into existing structures would achieve lip-service to environmental issues at best, and necessitate a constant battle to retain the original focus.

At the other end of the spectrum stands what has been described as a 'marxist' approach, in that it calls for radical transformations in modes of thought and institutional structures. Pivotal to EE discourses in this context are the educational philosophies outlined by Paulo Freire in his 'education for liberation'. Liberation implies popular revolution and this in turn entails fundamental transformations. Freire argues that such transformations can be achieved through the medium of education; 'education for change' also being an essential part of EE. Transformation however, can only become a reality through popular participation, necessitating educational methods that encourage the transition from knowledge to action. EE discourses support such structures and current trends towards socio-critical education promote similar problem-solving, participatory approaches. This fact suggests that EE may provide important perspectives for the development of education in general.

International and environmental changes have been described in a similar vein as an apparent paradigm shift from the "dominant social paradigm" to the "new environmental paradigm". The former encompasses technical-rational modes of thought, centralised institutions, and a reliance on economic development, while the latter calls for transformation in social organisations and institutions and decentralisation, and emphasises the local context. Gough (1997) employs the term "ecological/ecopolitical paradigm" to describe this transformation, using the philosophies of EE as a foundation,

...moving education towards such a paradigm does not simply mean more environmental education or other green issues being included in school timetables. Rather he [Gough 1987] sees the prospect of an ecological/ecopolitical paradigm as raising fundamental questions about schools as institutions and as agents of social transformation or social reproduction: "A paradigm shift involves change in our total world view..." (95).

Although this view requires radical and difficult changes, it is surely the only long-term solution to addressing the incompatibility of social structures and institutions with new methods and modes of thought such as EE. The implications that such differing paradigms have for the role of education, and EE in particular, are vast. Merely in terms of the curriculum, it can be seen that the types of knowledge considered important would vary considerably between the two paradigms. The scientific⁷ focus on the acquisition and analysis of ecological information indicated in the "dominant social paradigm", and the more grassroots, participatory education described by the "new environmental paradigm", each imply specific types of content for EE within formal schooling; the former emphasising a technical-rational focus and the latter stressing humanitarian foundations. Further, this implies an alteration in the way we must conceive of education, and the necessity of recognising all learning contexts. While this paradigm shift is not necessarily currently evident in all spheres of social and political life, it is viewed as a beneficial change in terms of both effective EE and the general improvement of the environment, inter-national relations, and national policy.

Within the realm of social change in general there are a range of positions that fall between these two extremes, apart from the marxist/pragmatist distinction and paradigms outlined above. These have been referred to as "dark green" and "light green" in the environmental arena :121), and "ecocentric" and "technocentric" (O'Riordan 1983 *in* :121). In each of these distinctions the former supports fundamental transformations in modes of thought, institutions, and prevailing world order, with the latter asserting that the most benefit can be gained by attempting change from within the status quo. In the field of EE Gough (1997) supports the idea that environmental perspectives have necessitated radical changes in education, government, and society in general. With many contemporary social ills being related to the problems of environment and development, this can then be extended into a

wide range of additional contexts. As well as demonstrating the need for change within educational and other formal institutions, it reveals the flaws in many traditional and established assumptions.

Having outlined a broad ideological range for attempting social change in general, its application to the field of CE, as suggested in Clayton's division of "overt resistance" and "pragmatic acceptance", is made clear. The spectrum in this case relates to responses made by the developing world to decisions of core nations. Within this context, western hegemonic modes of thought are often adhered to unquestioningly, contributing to an unbalanced (and therefore unequal) perspective on the issues at stake. Despite the difference in actual focus, the distinction remains strongly bound to decision-making activities and methods of response. The implications for educational research are far-reaching if change is our ultimate aim. We must focus on challenging systems, breaking boundaries, and fostering true democratic participation, all of which reside at the marxist end of the spectrum. One of the focuses of the structural change that is necessary lies in establishing a *transversal* perspective, rather than adhering to the discrete disciplinary units already set down in traditional education systems and formal institutions. If EE is to be truly holistic, democratic, and socially just then peripheral knowledge and perspectives must be given a voice. The optimum conditions for EE support notions of social change through education, a 'marxist' orientation, interdisciplinary structures, and increased attention to traditionally marginalised nations of the developing world. If these are the best conditions for social change of the type represented by environmental problems and we realise that current systems are inadequate for addressing these, then changing habits of thought and institutions accordingly must follow.

A Transversal Future

Ecological health continues to elude us - and perhaps indeed depends upon the reconstruction of patterns of thought. (Bateson, 1976:xii)

The predominance of technocratic patterns of thinking have often tended to encourage reductionist models of knowledge, consistent with the continuing drive to increased specialisation. Rigid and artificial disciplinary boundaries between knowledge areas characterise this view, each being dealt with in a unitary and isolated fashion. The emergence of environmental imperatives has subverted these ideas. By its nature the environment tackles multiple facets - environmental, political, scientific, economic, social, cultural - necessitating an interdisciplinary approach. Addressing environmental concerns has presented a series of challenges to conventional thought in education, national development, and inter-national relations⁸. Within formal education the study of the environment has typically been incorporated into rigid and limited disciplinary structures, predominantly within the subject areas of Science and Geography. This raises the question whether it is possible, or even desirable, to address environmental issues from within a traditional scientific structure. EE provides a 'blueprint' framework for ideal structures and methods in translating environmental objectives into concrete outcomes.

One of the major ideals of EE, and environmentalism in general, has involved the notion of interdisciplinarity - that environmental objectives can only be reached by addressing issues across all areas and forming new partnerships. The failure of EE in many cases has had its roots in traditional, rigid formal institutional systems. This type of rigidity is epitomised in the structure of educational institutions, with their adherence to arbitrary and traditional disciplinary boundaries despite the fact that they continue to reinforce, rather than challenge, social norms;

The various disciplines, therefore, too often become a rationalisation, a justification of the status quo, rather than a critical exploration of the problems which face humankind. (Price *in* Burns & Welch, 1992; 72)

This remains the case even within areas such as EE, which aims to change thought and action, and CE, which also is reformative by nature. Within education the idea of challenging boundaries extends beyond those exerted by traditional disciplines. Ideally, we should be able to use these insights to also tackle other assumptions about education. Broadfoot (2000), for example, suggests that non-formal and informal methods of education need to be considered alongside more conventional models. CE has also been seen as potentially multi-disciplinary but often constrained by a teleological inclination (Crossley, 2000). However, the case for interdisciplinarity has been put time and again in a range of contexts. The environmental and comparative perspectives have continued to be incorporated into a fragmentary system, based on old ideas of what interdisciplinary really is, or what it can be. For example, while Gibbons et al (1994) outline a shift in the research process, focusing on trans-disciplinary knowledge production at the interface of theory and practice, it remains in the realm of content and, therefore, does not address the basic flaws within the structures themselves. Patricia Broadfoot (2000:12) touches on a new distinction to be made in her choice of "meta-disciplinary", suggesting a more overarching view, and states that such a view of CE could "illuminate the complex and interrelated realities of our changing world".

My own research showed, indeed, that we can take a step further and proceed from interdisciplinarity towards what the Brazilian department of education has called *transversality* (Secretaria de Educação Fundamental, 1999). While there are obviously many similarities between the two concepts, the major difference lies in views of how knowledge is structured. Interdisciplinary concepts cross the boundaries between fields of knowledge, and try to incorporate themes such as the environment into all school subjects. Transversality on the other hand questions, and attempts to break down the traditional segmentation of these fields, so that

...the treatment of questions brought about by the Transversal Themes explains the inter-relationships between the objects of knowledge, in such a way that it is not possible to form a work situated in transversality while taking a rigid disciplinary perspective.... transversality opens a space for the inclusion of extra-curriculum knowledge, enabling the reference to significant systems constructed in the reality of the students. :31 vol.8)

This mode not only attempts to incorporate previously overlooked areas, but also rejects what I have called *isolationist* perspectives that are apparent in the increased fragmentation and specialisation of the contemporary world. Transversality acknowledges that areas of knowledge and action are not functionally discrete, but that there is continuity across and within all sectors (Springer, 2000). It does not make sense, in this view, to merely incorporate an environmental perspective into distinct areas. This mode of thought recognises the artificiality of traditional boundaries and attempts to address old problems in new ways, working with the structures as well as the content.

The predominance of industrialised, western discourses on EE and environmental and social issues in general, is a barrier that continues to plague us. The international aspect of comparative studies therefore places CE in an advantageous position for the promotion of transversality in all its forms. Issues of education, environment and development elicit different responses from industrialised and developing nations, as well as different groups of people, engendering related patterns of EE. Within EE literature drawn from the developing world for example, there is much more emphasis on the social and spiritual aspects of the environment and education, as well as issues relating to development. However, the

positions of developing nations are often overlooked in academic literature, resulting in what Gough (1993) has referred to as the 'silencing of non-western perspectives'. By way of illustration, although current literature from Brazil introduces the concept of *socio-ambiental* (socio-environmental⁹), such notions have not been incorporated into EE discourses in the industrialised world, exemplifying the marginalisation of the views of developing nations. CE has itself been guilty of perpetuating such views within education generally, focusing on and drawing its contributors primarily from 'developed' nations, and continuing to publish predominantly in English (Little, 2000). While this is not necessarily a deliberate decision, it demonstrates the permeating and insidious nature of barriers to change, and the difficulties inherent in addressing it.

The necessity for breaking barriers of habitual thought and custom has become clear. New alliances must begin to be formed between levels and areas of society previously believed to be disparate, or even at odds, if we are to solve contemporary and future problems. It is not only desirable, but also necessary, to challenge artificial boundaries in order to bring about these new modes of thought and action. We must all begin to use each others' knowledge more constructively in order to achieve the outcomes that we have already desired for too long.

Conclusions

In order to examine social problems and the notion of social change my doctoral study focused on the environment as a current, contentious and global issue, and one that encompasses, in varying degrees, many other areas requiring attention. Where environmental issues encompass various social ills, education may be seen as reflecting social interactions generally, and is a major component of social transformation. EE, therefore, as the synthesis of these areas, was an ideal medium for the examination of such issues and from which to abstract more general principles. The study of Environmental Education itself has an established literature. However, my decision to employ it as a method of research resulted in a number of interesting outcomes. Primarily, due to the scope and nature of EE, I was able to gain insights into areas other than the content, teaching and application of EE in formal education. Conclusions reached touched on non-formal and informal educational measures, government structure and policy-making, public attitudes, non-government organisations and social movements, national development, community participation, inter-national relations, local, national, and international articulation of environmental and economic problems, globalisation and others in a near endless list.

Through the examination of EE content and philosophies in two different countries, and tracing lines between the local and international levels, I was able to arrive at conclusions outside of the educational sphere. Attempting to use EE as a mirror, without slipping into the study of EE itself, was a difficult task and required constant vigilance. The present study highlighted the ways in which the examination of educational structures can be used as a mirror for the way in which a country or community functions on many levels, and the way this is translated (or not) into change. The conclusions regarding change are a particular example of the necessity for institutional change advocated in the results of the doctoral thesis. That is, that current methods are inadequate and that change is required in a number of areas. The two of most concern to educational research are tightly linked: a move towards transversal perspectives and the potential of education to shed light on other areas of human endeavour.

In the first instance the examination of EE in its current forms showed traditional educational and political structures to be incapable of adequately harnessing EE or achieving its

objectives. The main impediment in this context is the rigid and arbitrary disciplinary boundaries that exist in such institutions, and are a defining feature of modern existence. This is made manifest in the increasing specialisation that is deemed necessary in all areas, resulting in perspectives that value isolated skills and knowledge. The perceived antithesis to this is the adoption of models encompassing transversality. Within professional circles this translates into more than sharing expertise and further collaboration. Although necessary, these components come to little more than the old ideas in new ways. Again insight comes from a well-aged source,

It would be an unsound fancy and self-contradictory to expect that things which have never yet been done can be done except by means which have never yet been tried. (Bacon, 1620 Aphorism VI)

Boundaries must be challenged and new things tried if new things are to be achieved. PhD students and researchers in general will be familiar with the edict to 'narrow the focus'. This paper is a call to expand.

Secondly, Paulo Freire reminds us that, 'education does not occur in a vacuum'. Further than this even, education is but a small part of the whole of society and social interaction. While this may seem self-evident, education continues to be studied as though it were an isolated entity, which is studied for the conclusions that can be drawn within itself. Within CE the importance of a broader perspective, extending beyond the school walls, has long been understood,

In studying foreign systems of education we should not forget that the things outside the schools matter even more than the things inside the schools, and govern and interpret the things inside... (Sadler, 1900:3)

Despite this, CE has maintained a focus on formal educational structures and procedures, remaining bound within contemporary trends of specialisation. One may wonder whether perhaps the concept of the 'liberal education', on the Classical or Renaissance model, is something that has always been with us and is merely lost in a wave of modernism. Perhaps we should be speaking of a return to transversality, rather than touting it as a new model. The study of EE has shown the necessity of change, as well as the areas in which it is most urgent. In relation to the title of this paper; it is not, perhaps, merely serendipity that Schriewer (2000) recently argued that "education should be conceived as part of a socio-cultural project of intentionality; that societies and groups clarify in the mirror of the other their own intentions for future development" (*in* Broadfoot, 2000).

Mirror indeed.

A Final Note - Bacon's "Idols of the Mind"

It would be naïve to imagine that change may be as 'easy' as renovating structures and institutions. Among the major difficulties that we have to contend with are our basic modes of thought, and Francis Bacon made astute observations on the nature of these obstacles that are worth citing here. Central to his thesis was that our knowledge is impeded by various factors, both external and innate. This premise is still pertinent over 350 years later. Bacon identifies four major impediments, or *idols* - idols of the cave, theatre, market-place and tribe. The final three idols relate to the three pillars described in my doctoral thesis. Those of the 'theatre' represent older systems of thought, or my traditional institutions; the 'market-place' points to limits imposed by language; while the 'tribe' focuses on human nature, our

tendency to dichotomise and make universal inferences from only limited observation, relating strongly to the discussion of development. The fourth idol, that of the cave, is concerned with our individual peculiarities, our reactions, assumptions, and hidden biases. These psychological barriers have often gone unremarked in discussions of change, and even more noticeably in the maxim 'education for change'. For although education does have a great capacity for change it cannot afford to ignore these idols. As outlined above, education is only a small part of society and heavily embedded within it, making action at odds with it a difficult proposal.

If our capacity for change is severely constrained by such psychological factors then the function performed by educational researchers becomes increasingly important. This is not to say that researchers are not influenced by these same idols - mere mortals we remain! Research has its own traditions and its own institutions and thus, is also influenced by precisely these idols. The research tradition, the physical structure of our universities, expert domination of fields of study, the review process; these continue to be beneficial, merely inadequate. But we also continue to provide an illusion of forward movement, while remaining trapped in old systems of thought that are not equipped to deal with contemporary problems. Being thinkers, we are in a unique position to reconceptualise antiquated methods. If 'education for change' is to become a reality there must be a concerted effort to change the very basis of what we do. What this means is that we should be prepared to expand our ways of researching and our understanding of what that constitutes.

Notes

1 It is reasonable to substitute *knowledge* for science in the context of seventeenth century thought.

2 Attributed to the Greek thinker Heraclitus, in his poetic aphorisms (36) written around 500BC.

3 Some examples of such 'curricula renovations' are drug education, multicultural education, and citizenship education.

4 The term 'marxist' as used in this context does not refer to the political movement as such, but rather indicates the revolutionary and transformative thought associated with it.

5 Translations from Portuguese to English were conducted by the author. Every effort was made to remain true to the original sentiment of the Brazilian works.

6 Ivan Illich stated early on the belief that such "externally induced" educational systems may in fact hinder true development, suggesting that "the plows (sic) of the rich can do just as much harm as their swords" (357).

7 The ensuing discussion is simplistically labelled 'scientific' versus 'social' focus. This is certainly not to dismiss the sciences or scientifically acquired information. Science is an indispensable part of environmental discourses, both for its mode of enquiry and the factual basis for decision-making. However, it is beyond the remit of this paper to expand on this, and therefore I hope to be forgiven for what may be seen as a willful contribution to the misunderstanding of science.

8 The hyphenated term *inter-national relations* is a bounded concept used to denote relations between individual nations, as distinct from the academic study of the

unhyphenated equivalent. While it does relate to relations between all countries, its primary concern is the analysis of particular countries to each other rather than to the whole. In this study 'international relations' is used only when referring to the construct that defines global interaction in general.

9 'Socio-environmental' is a term that does not seem to exist in recent western-oriented environmental literature. It has been interpreted by the researcher, in the context of the Brazilian literature, by analogy with 'socio-economic'. At a superficial level, 'socio-economic' is a term used to describe an individual's or nation's social position as determined by economic indicators. By the same logic, 'socio-environmental' refers to an individual's or nation's social position as determined through environmental indicators, for example).

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