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THE “SAGE ON THE STAGE” IS NOT SUSTAINABLE: PARTICIPATORY PEDAGOGY FOR A CHANGE

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ABSTRACT: At the cusp of the 21st century natural resource educators face a bewildering variety of crises and contradictions. First, tomorrow does not replicate today, let alone yesterday. So not much is achieved by maintenance learning - the learning of fixed rules for recurring patterns. Secondly, learners are apt to behave like consumers and can secure access to education without having to endure the indignities of tyrannical teachers, capricious requirements, lectures or other manifestations of a “transportation model” of education. Thirdly, there is doubt about the extent to which “progress” can be wrought from the calm certitudes of “tested knowledge” and “objective” science. Indeed, in some places, there is suspicion that natural resource education is part of the problem - corporatism, environmental degradation, collapse of communities - and not part of the solution to what ails the planet. With these factors in mind the author maps approaches to education about natural resources and argues that there should be a migration from techno-rational or functionalist perspectives towards humanist, radical humanist and radical functionalist approaches.

INTRODUCTION

University teaching and other forms of pedagogy are not neutral, benign or innocent. Despite the fact some educators still think education involves the “sage on the stage” delivering lectures, at the dawn of the 21st century, pedagogy is a fractious, contested, difficult and exciting process.

The situation is particularly perilous for natural resource educators called upon to teach about matters for which there are no easy solutions. For example, at the time of writing (February 6, 1998) the local, national and international media are carrying this headline - “Fish Stocks Disappearing World-Wide, Scientist Says” (*Globe and Mail*, February 6, 1998, p. A1). Using nearly 50 years worth of U.N. data, a team at the University of B.C. Fisheries Centre claims that because of “industrial fishing” many stocks will be eliminated in 25 years. “The collapse of cod stocks on the East Coast and the shocking decline of salmon in both the Pacific and Atlantic led many to worry that industrial fishing had reached unsustainable levels,” says the story.

Sockeye salmon lie at the centre of B.C. coastal identity and the “Cloverleaf” trademark defines western Canada with the same resonance as grizzly bear, rain forest, fiords, mountains. By confronting corporatism and the excesses of techno-rational or “industrial” modes of fishing, these UBC researchers will incur some wrath. Around the world, corporate spin-doctors will challenge the methodology of their study and then move to stunt its impact on the industry. The corporations

will cite the importance of jobs and the imperatives of global competitiveness. When these researchers face their classes on Monday morning students will have questions. The conversation that results should be interesting and demonstrate that education is a political process.

There is no such thing as “neutral” education. Somebody’s interests are always being served. Even those who claim they merely provide “facts” or are “professing” about what are only “technical matters” are taking a position. Education is ideological and denials are themselves evidence of an ideology - which, in natural resource education, is too often nested in an uncritical acceptance of corporatism, western-style notions of progress and development, an embrace of globalisation and international competitiveness and a refusal to see that program content and pedagogical processes are shaped by the context in which they occur.

Purpose

Many of the factors shaping natural resource education are the same as those influencing the rest of the university. We live in postmodern times where education is increasingly constructed as a commodity and students as consumers. Cuts, the commodification of education and the emphasis on performativity are shaping all parts of the university. Moreover, the arrival of concepts like distributed learning and the uncritical and rapid embrace of the World Wide Web and “virtual universities” disturbs face-to-face higher education.

As well, powerful factors unique to the natural resources field are shaping education. The days when natural resource education rested on almost universal respect for and acceptance of objective science, techno-rational discourse and positivism, have almost disappeared. What remains are contradictions, serious issues and few easy solutions. At the turn of the century universities are engaged in fierce competition with each other and their authority is in doubt. Moreover, learners have other options. As well, there is no one way to engage in pedagogy and educators should be wary of the latest fad, bandwagon's thundering through the academy or the seductions of the latest metanarrative. As Chairman Mao was apt to say, these are "interesting times."

The purpose of this paper is to raise issues pertaining to university education in natural resources at the dawn of the 21st century. Our focus is on program content and pedagogical processes. There is no one right way to do pedagogy but numerous issues merit consideration. Hence, in this paper the focus is on issues, not solutions to the problems of pedagogy.

Increasingly, natural resource education program content and pedagogy are being shaped by

- * Rapid change
- * The commodification of education
- * The arrival of distributed Learning
- * The collapse of disciplines and loss of confidence in "scientism" and functionalist discourse
- * A need for theoretical pluralism

RAPID CHANGE

It has become almost a cliché to note that change is the only constant of our time and many scholars or popular writers (such as Toffler, 1970; Naisbitt, 1982; Valaskakis et al., 1979) coined aphorisms like "future shock," "megatrends," and the "conserver society" that are now part of popular discourse.

Rapid change is stressful and calls for novel responses. University educators have been slow to respond and many behave as if tomorrow will simply repeat today. But education is about the way things are now no longer suffices. The fact things will not be the same in the future is difficult to comprehend and usually dismissed with aphorisms like "we'll cross that bridge when we come to it." For example, who heard one word about HIV/AIDS during their high school or university years? And to what extent did the Newfoundland cod fishery collapse because, in the interests of short-term expediency, too many people decided to "cross the bridge when we come to it."

As well, the time lag between the invention and application of technological or conceptual innovations has drastically decreased. More than 90 percent of scientists and inventors in all of human history are alive today. It took 112 years to develop practical applications arising from the discovery of prin-

ciples of photography. In contrast, only two years separated the discovery of principles associated with and production of solar batteries. Rapid change is accelerating, rather than diminishing. In times of rapid change, and as the future becomes more complex, there is a tendency to adopt fundamentalist beliefs. Fundamentalism, by definition, is the opposite of learning. It is a reaction to undigested complexity and, in some parts of the world, gnawing at the social fabric with such insistence that entire nations are threatened with catastrophe.

Many people profess fundamentalist beliefs that have little apparent impact on their behaviour. But what makes the situation disturbing is that fundamentalism in politicians is isomorphic with the psychological vulnerability of the entire populace. Sometimes, it is easier to psychologically retreat to refuge provided by prior learning or simple-minded beliefs. Psychologically, this is comparable to the fear of freedom. Fromm (1941, 1949) used to explain the reactions of the German populace to the fundamentalist and fascistic exhortations of the Nazis.

The widespread recourse to fundamentalism is probably related to uncertainty evoked by economic uncertainty and psychological despair. Optimists hope the present economic and associated psychological crisis will pass and soon it will be business as usual. This is a forlorn hope and, in the meantime, the widening gap between complexity and the human capacity for learning could be fatal; there will be no chance to view the present situation from a long term perspective. When Botkin et. al. (1979) warned about the dangers of learning by shock, we knew nothing of ecological refugees from Newfoundland, the AIDS crisis just ahead or 26 million inhabitants of India (equivalent to the entire population of Canada) displaced from their homes by "development" of natural resources (Sainath, 1996).

The inability of some to learn about the HIV/AIDS virus has cost millions of lives, almost wiped out certain occupational groups in North America and threatens the existence of entire countries. In the same way, Newfoundlanders are witnessing the unravelling of a 500 year old outport culture because of the failure of the cod fishery. Whatever learning occurred there was too little and too late. Learning by shock is deeply-rooted and expressed in aphorisms such as "wait until the crisis comes" or "cross that bridge when you come to it."

It is the complex and interrelated nature of psychological, energy, economic, natural resources, educational and other issues that constitute the world problematique that preoccupies the Club of Rome and gave rise to the notion of innovative learning. Fundamentalism is related to unemployment. Unemployment is related to economic conditions, and so on. Education pervades all issues and has become a prerequisite for survival.

New Approaches

The notion of innovative learning was elaborated in a book cunningly entitled *No Limits to Learning* (Botkin, et. al., 1979). Although it echoed many of the themes of lifelong education and *Learning To Be* (Faure, 1972) its focus was on the future. It exhorted citizens to be proactive and challenged educators bought up with the notion that their job was to “satisfy needs.”

The argument runs like this. Reactive education that responds to the homeostatically-motivated needs of learners, communities, or nations might be acceptable in times of slow change or social inertia. Today, rapid change has created a gap between complexities in the socio-cultural and technological environments and the human capacity for learning, understanding and action. This is a man-made human gap (most women will agree). Unlike earlier times when citizens were barely conscious of events in the global environment, people are aware of contemporary change. Planet Earth is in the midst of a transformation more profound than the iron age or Copernican revolution. The situation can be portrayed as in Fig. 1. Earlier this century the gap between the human capacity to learn, and complexity in the environment that had to be comprehended, was much smaller than the one prevailing today.

The Club of Rome has frequently asserted that steps taken to resolve the world problematique must involve people with different values working together and it appears that traditional maintenance approaches should be supplemented by innovative learning.

Maintenance Learning

Maintenance learning is a problem-solving process designed to help individuals adapt to external pressures. It is necessary for societal stability and harmony and maintains existing systems and the established way of life. Maintenance learning involves the acquisition of fixed rules for recurring patterns. As noted, it is appropriate during times of slow change or social inertia. But it will not adequately equip people for a future characterized by turbulence and shock. It is well understood since it resembles present educational arrangements. Needs are diagnosed and students supposedly filled-up with available knowledge. They are then literally and metaphorically capped and sent into the world. Much education is also maintenance-oriented since it focuses on knowledge designed to satisfy existing needs. It is often delivered in a pedestrian manner by the “sage on the stage” who thinks education is a process of information-transmittal.

Innovative Learning

Innovative learning is a necessary prerequisite to the solution of global problems and a means to prepare individuals and societies to cope with, anticipate, and create, new futures. Much

work needs to be done on its theoretical foundations and practical implications but, for present purposes, two features are of critical significance. The first concerns anticipation which runs counter to the biological and homeostatic, notion of adaptation.

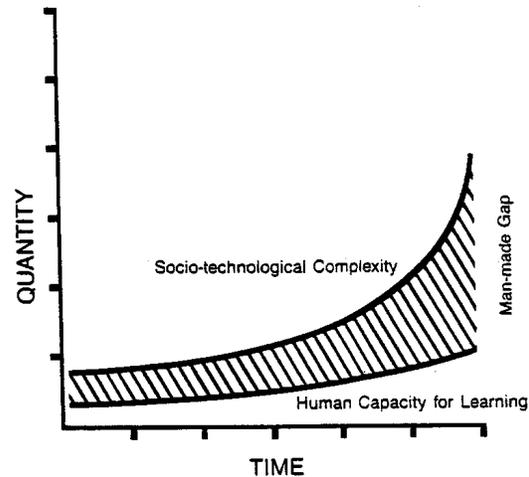


Figure 1. Gap between complexity and the human capacity to learn

Anticipation. Whereas adaptation suggests a reactive adjustment to external pressure, anticipation implies a need to prepare possible contingencies and long-range future alternatives. Thus, the anticipatory part of innovative learning requires that people use techniques such as forecasting, simulations, scenarios and models. As Botkin et al., noted “ it encourages them to consider trends, to make plans, to evaluate future consequences and possible injurious effects of present decisions, and to recognize the global implications of local, national and regional actions. Its aim is to shield society from the trauma of learning by shock. It emphasizes the future tense, not just the past. It employs imagination but is based on hard fact. When the gradual deterioration of the physical or social environment does not move those who should be alarmed, then anticipation either is not present or is not given sufficient priority. The essence of anticipation lies in selecting desirable events and working toward them; in averting unwanted or potentially catastrophic events; and in creating new alternatives” (1979, pp. 12-13). The future will not be a linear extension of the past so maintenance-oriented educators that merely react as needs emerge had better adopt a new posture. Educators can no longer behave like ambulance drivers showing up after the accident has happened. For example, it is better to learn about cod before they disappear.

It is useful to administer first aid at the scene of an accident, so a certain amount of maintenance learning will be required, but better to prevent problems by selecting and working toward desirable and less accident-prone futures. Moreover, people should not feel overwhelmed by the massive and apparently intransigent nature of global problems because it is

the accumulated effects of local decisions that make or break us.

Participation. Another feature of innovative learning is participation. This has been a long-standing preoccupation of educators who have treated it as a prerequisite to, and consequence of, adult education. Regrettably, "participation" is not a prominent part of pedagogy in university natural resources departments. In a democracy, participation is associated with power and influence. Thus, by failing to participate in the organized group life of their community, many people disenfranchise themselves. Today, the demand for participation is felt by governments, communities and nations everywhere. Third World countries desire equal participation with the developed world in decisions that affect them; rural populations demand facilities taken for granted by urban people; workers want participatory democracy on the factory floor; indigenous people want a voice in and control of decisions pertaining to their land, resources and place in society; many women are fed up with patriarchy.

It appears that people are committed to something as a function of the extent to which they were consulted in its creation. As a result, adult but not higher educators generally stress participatory techniques that actively involve and use the experience of learners. The university professor may happily expose students to lecture after lecture from notes that grow yellow as the years pass. But adult educators, somewhat more responsible, come equipped with simulations, role playing exercises, games, case studies and other materials that actively engage the learner in "participatory" ways.

Those enamored with electronic technologies often do not recognize that the one-way transmittal of information is not participatory. It is like throwing water at a bottle; most lands on the floor because response or feedback - the essential element of participatory learning - is missing. This is a timely point because there is nothing particularly innovative about using technology to deliver maintenance learning. It is just a new way of maintaining the status quo and provides people with a splendid excuse to hack at institutions where learners actually gather in groups and participate together. The much-vaunted capacity of the Internet to foster participation is often abused. Instead of encouraging learners to engage with the deep structures of the course, architects of many Web courses confine "participation" to the banalities of the "chatroom" (Boshier, et.al., 1997; Wilson, 1998).

EDUCATION AS COMMODITY

Perhaps the most significant factor shaping pedagogy in university natural resource programs is commodification of education and stress on performativity. In more tranquil and utopian times university scholars and their loyal band of students laboured at the frontiers of ignorance in an ivory tower more or less insulated from the town on the flats below. When town

met gown it was for a glass of wine at the faculty club. These days universities are preoccupied with budget cuts, restructuring and upstart competitors in colleges or, god help us, private corporations.

Globalisation and internationalization has also brought a new set of challenges in the form of distributed learning. Just a few years ago, universities offered face-to-face courses. Distance education or open learning was the more or less exclusive preserve of open learning institutes or universities specifically created to do it (e.g. the Open University of the United Kingdom). The motivation for these earlier forms of correspondence or distance education and the later notion of open learning was nested in a democratisation discourse. Programs were designed to serve the "hard-to-reach" or other folks who preferred to study at home. Regrettably, far too many academics in face-to-face universities looked down their noses at these allegedly inferior providers of distance education. When given the opportunity to play in this field the answer was usually "no." Little did they know that by the late-1990's the boundaries between face-to-face and distance education would collapse and the once despised providers would be in their back yard. The maligned "they" are now us.

World Wide Goldrush

Contrary to what techno-utopians and editors of *Wired* magazine have to say, the World Wide Web does not represent a paradigm shift and is not the dawning of a new age in education and learning. However, there is a race to create virtual universities and market courses to learners in distant locations and these will help shape the future character of education about natural resources.

Contrary to popular belief, the Web is not World Wide. It is largely American and, even there, a creature of the metropole. The earliest navigators had to identify the middle of the world in order to calculate longitude. With a fair modicum of colonial temerity, the British persuaded those interested that the middle of the world ran through Greenwich in East London. To this day, it is a thrill to stand astride the meridian with one leg in the western hemisphere and the other in the east. In earlier times "west" meant civilization while the "far" east was exotic and dangerous. In the same way, the meridian of the Web runs along the west coast of America. It starts just south of Vancouver, Canada, in Redmond Washington where rich Microsoft employees are transforming what was once a Seattle suburb. It's centre is in the San Francisco Bay area, Palo Alto and the sprawling industrial park of Netscape. The spine then snakes through the Los Angeles basin and ends in San Diego at the border with Mexico. Unlike Greenwich, it's greatest influence is to the east - across the U.S. mainland and on to Europe.

Whereas correspondence, distance education and open learning were infused with preoccupations about equity and access, the atmosphere around distributed learning resembles a

goldrush. In this goldrush prostitutes flourish, learners buy fools gold and there is a sense that educators who don't join will be left behind and suffer an early demise. Unlike earlier goldrushes when staying home was an option, this time educators are mounting the wagon with unseemly haste. They don't know much about what lies along the trail, the destination is obscure, there is scant research to guide their journey and marauding corporations have already staked claims. But it isn't boring and almost anything can happen.

These things are happening because the Web is alluring and, for folks tired of tyrannical teachers, capricious administrators and the other tedium of face-to-face education, the notion of securing education from their own home is attractive. Despite serious and profound problems associated with providing or securing an education on the Web, a curious coalition of interests stills voices that would otherwise raise awkward questions.

Neo-Liberal Perspective

Neo-liberal or rightwing politicians like the Web because it seems efficient. It nicely fits the exhortation to "do more with less." Moreover, because it straddles national boundaries, the Web coincides with the interest in "internationalizing" education within the context of the "global economy."

Large numbers of fee-paying learners both on and off-campus can be reached all at the same time with materials written by a course designer whose employment was very likely terminated when the course was ready. Indeed, the most malevolent of the neo-liberals anticipate a day when there will be no difference between on and off-campus education, much (or, if possible, nearly all of it) will be mediated by computers which don't form unions, go on strike, complain about inferior food services, demand new books or need a place to park a car. At the University of B.C. in Vancouver distributed learning is even being touted as an instrument to cut down on the number of vehicles that wind through affluent suburbs (wherein politically well-connected people have their abode) on the way to campus.

While putting one hand into the learner's wallet to extract a substantial "cost-recovery" fee for the privilege of doing the Web course, in the other hand the Director of Distributed Learning holds a placard upon which is written the word "access." In other words, the language of lifelong education, of equity and access, is used to obscure the fact Web learning and education is a salient aspect of commodification. Is the World Word Web a code for World World Profit?

Anarchist-Utopian Perspective

For entirely different reasons anarchist-utopians who have no time for globalisation discourses or the excesses of neo-liberalism also like the Web because it enables them to subvert unequal power relations that infest much of formal education.

In the 1970's Ivan Illich (1979), a leading anarchist-utopian, condemned the self-serving nature of formal education and called for the deschooling of society. In many ways the Web exemplifies the ethos of deschooling and, around the world, indigenous people, women and others typically locked out of formal education, applaud the opportunity to form solidarity-relationships with like-minded folks elsewhere. With money-minded neo-liberals and left-oriented anarchist utopians supporting it, Web learning and education is enjoying rapid growth. If there are murmurs of dissent they are muted.

Beware of Techno-Utopia

Distributed learning is a close descendant of familiar folk - correspondence study, distance education and open learning. But, whereas the first three generations of this family were nest in a democratizing discourse, their offspring - distributed learning - is a dodgy character. The prime force driving development of distributed learning is profit. Equity, access, the problems of the hard-to-reach are in the "vision" and "mission-statement" but there as window-dressing, part of an effort to drive single-mode distance education operators out of business. Those who previously dismissed courses offered at a distance as second best and declined opportunities to form what are now euphemistically called "partnerships" with open learning agencies, correspondence education providers or distance education institutions, now want not part, but **all** the action. In this flotilla, advocates of distributed learning have inherited elaborate videoconferencing facilities, still produce traditional courses packed in ringbinders and produce video and audiotapes and many of the other accouterments of the so-called older forms of distance education. But the Web is their flagship.

Technology-mediated distributed learning, like all forms of education, is not simply a matter of moving information. Nor is it ideologically benign or politically neutral. Regrettably, there is far too much American influence on the Web (Wilson, Qayyum and Boshier, 1998) and little regard for the interests or learning styles of indigenous people or those living outside the metropole (Boshier, Wilson and Qayyum, 1998). Moreover, despite all the talk of empowerment and "solidarity-links" between environmental activists, popular educators involved in struggles over land, resources or agrarian reform and the possibilities for decentralization, there's more to it. For example, Mander (1996) claims technology is a powerful instrument for centralization and a potent weapon in the colonization of states that hitherto have been out of reach. On the surface, distributed learning looks like a sexy and innocent newcomer. But as is so often the case there's more to it. What's needed in natural resources education is a map, with a GPS or loran, that can guide the unwary through the labyrinths of educational technologies, theory and practice.

Innovative learning, distributed learning and all the other attributes of pedagogy in the modern university - problem-based education, cooperative education, internships, lectures, semi-

nars, colloquia - do not serve all interests equally well. Moreover, they're based on varying conceptions concerning the nature of reality. None of them are innocent methods or techniques. All bristle with ideological baggage.

It has become increasingly difficult for educators to take refuge under the cover of "objective science" because, as well as representing a positivist epistemology, it too is an ideology. It is necessary that educators take a position concerning natural resources. It is inevitable that this position will be expressed in program content and teaching processes. With this in mind we now present a map of theory that identifies different world views concerning program content and teaching/learning processes.

MAPPING THEORY

The model presented below embraces four world views that offer different ways of thinking about education concerning natural resources. It was originally developed by Burrell and Morgan (1979) to explain organizational behaviour but has since been deployed to analyse different approaches to AIDS education (Boshier, 1989), adult education (Boshier, 1994) and the cause and prevention of fishing vessel accidents (Boshier, 1996). The version shown here is a postmodern elaboration by Paulston and Liebman (1994) and Paulston (1996) which has been used to study comparative and international education and has the potential to analyze a broad array of phenomena.

There are two axes laying beneath Fig. 2 that lie in an orthogonal (right-angled) relationship to each other. Treat them like latitude and longitude on a nautical chart. The first concerns ontology - assumptions about the nature of reality and the way people perceive or construe things in the world. The second concerns the importance of power relations (e.g. between different interest groups, government and environmentalists, First Nations and Europeans, men and women). Think of this map like Microsoft windows. The ontology and power relations axes are laid down first. They exist at right-angles to one another. On top of this window Paulston has laid down two overlapping circles. The top layer, which comprises the third window to be opened, are various theoretical fragments, theories, and conceptualizations contained in the two circles. When reading this map it is important to note the ends of the two axes that frame the model (*transformation versus equilibrium* orientations on the vertical power-relations axis; *idealist-subjectivist versus realist-objectivist* orientations on the horizontal ontology axis).

Ontology

The horizontal axis concerns ontology - the essence of phenomena. Researchers, teachers and citizens vary with respect to the extent to which they think there is an objective "reality" - out there - external to the individual. For some, there is an

objective world inhabited by lawfully interrelated variables. Most of us brought up in the positivist tradition believe this. For others, such as many feminists or indigenous people, reality is essentially a subjective phenomenon that exists within consciousness. It exists "in the mind." On the left end of the ontology (horizontal) axis are "idealist-subjectivist" orientations. On the right end are "realist-objectivist" orientations.

Power relations

The vertical axis concerns power and self-interest. Power relationships lay at the centre of education about natural resources. Every instance of education about natural resources serves some interests better than others. Teaching about the "management," "conservation" "exploitation" of natural resources is not a neutral, technical or benign process. It involves all kinds of struggles - between environmentalists and capitalists, local communities and trans-national corporations, men and women, different ethnic or occupational groups and so on. Somebody's interests are always being served when education programs are mounted.

Most forms of education occur in the bottom part of this model and, as such, tend to reinforce extant power relations. Where the educator claims to be neutral and just "delivering facts" they are reinforcing extant power relations. However, those "teaching against the grain" from a neo-marxist, critical or radical humanist perspective or a more materialist or radical functionalist perspective are challenging extant power relations.

Using the Map

The model contains four world views that, if adopted, would require different kinds of program content and pedagogical approaches. The four world views in Fig. 2 help natural resource and other educators in a variety of ways. First, the map shows the interrelationship between most of the theoretical "-isms" that inform education theory and practice. Secondly, this mapping of discourses and territorial disputes provides space for a plethora of perspectives. It avoids the seduction of proposing some singular or universal approach to education. Thirdly, like a nautical chart or geographic information system, it provides the academic traveler and exhausted teacher with landmarks in what can be a hostile academic world. As well, it enables an academic to locate themselves and get an aerial view of those in close proximity or on the other side of the ontological or power relations divide. If a traveler is not happy with their current location this map, like a loran or GPS, shows the way to alternative destinations.

Before analyzing how each of the world views inform the work of natural resource educators, it is important to point out that this map is neither neutral or benign. Functionalism is the epistemological servant of globalization and global competitiveness. Particularly in the U.S., but also in Europe and Oceania, there is an obsession with performativity, "pragma-

tism” and “what works.” Functionalism is the dominant discourse of the late twentieth century and, in many natural resources circles, so taken-for-granted it doesn’t merit attention, let alone critique. However, as many exponents of postmodernism have stated, pragmatism and functionalism (and its corollaries, instrumentalism, performativity, and the notion of an applied discipline) produced Chernobyl, Bhopal, Nagasaki, the collapse of the Newfoundland cod fishery and a host of other horrors.

The problem with functionalism is that there’s more to it. By providing a map with four equal-sized zones Paulston could create the impression that the “alternatives” in this map (i.e. everything other than functionalism) have a more-or-less equal impact on education. This should be the case but isn’t. In late twentieth-century universities, academics (particularly in natural resource units) are strongly encouraged to produce practical answers to pressing problems. A functionalist world view prevails. In B.C., natural resource issues are paraded across newspaper front pages most days and there is no shortage of acrimony and accusation about the collapse of the fisheries, non-sustainable forestry, the degradation and misuse of agricultural land, damage caused by mine tailings, the theft of native land, misuse of waterfront and many other matters. Politicians and the public want answers. Sooner, rather than later.

FUNCTIONALISM

Functionalism provides an essentially “rational” (or “realist-objectivist”) explanation for what needs to be done with natural resources. It is the dominant ideology of our time and characterized by a concern for social order, consensus and social integration. Its epistemology tends to be positivist. Functionalists want practical solutions to practical problems and are usually committed to scientific engineering as a basis for change with an emphasis on gradualism, order, and the maintenance of equilibrium. Functionalists attempt to apply models derived from natural sciences to human behaviour. They struggle to derive “facts” and “theory” immune to local disruption or refutation. Generalization across contexts is desirable. Within this world view a good theory is testable, parsimonious and significant. Hopefully it will explain and predict phenomena everywhere.

Related Theory

Evolutionary perspectives, neo-evolutionary theory and systems analysis are all part of a functionalist world view. Education informed by functionalism includes most government training, reskilling programs, most so-called upgrading programs, most continuing professional education, nearly all tech-

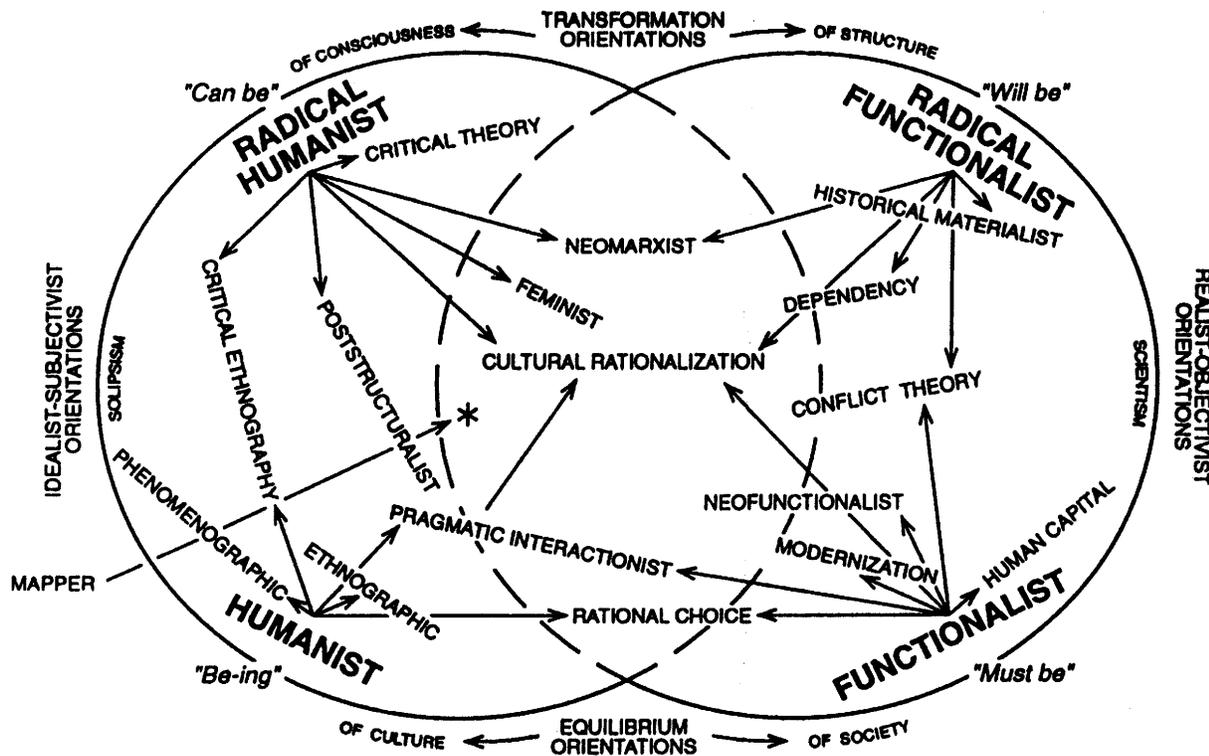


Figure 2. Paulston’s “global mapping” of discourse and territorial disputes that frame educational theory and practice

nical or vocational training and basic education run by schools, colleges and other school-like institutions.

Natural Resources Education

In natural resources programs a functionalist is preoccupied with how things work (rather than with why they work this way and whose interests are served). Functionalist oriented programs of education about natural resources would be nested in a discourse of “exploiting” natural resources or “man over nature.” Functionalists have an uncritical (sometimes unwitting) commitment to extant power relations and are untroubled by the notion of preparing students to work harmoniously in what others might regard as predatory corporate structures. Functionalists will invoke notions of sustainability and can fairly claim to be working for the public good. But the politicality of sustainability has been gutted from their deliberations and, ironically, functionalism turns out to be not so functional!

HUMANISM

Humanists are subjectivists in that “reality” is what it is construed to be. Great effort is devoted to adopting the frame of reference of the participant. Social “reality” is a network of assumptions and “shared meanings.” The subjectivist ontological assumptions shared by humanists stem from the notion that human affairs are ordered, cohesive and integrated. Humanists use interpretivist methodologies and are more concerned with understanding subjectively construed meanings of the world “as it is” than with any utopian view of how it might be.

Related Theory

Movements, perspectives and authors located in this corner include Mezirow (1989, 1990), with his concern for perspective transformation which involves the modification of meanings ascribed to everyday situations. For example, after attending a consciousness-raising course, people might ascribe a different set of meanings to land-use planning or colonial appropriation of indigenous land. Another example would be a course designed to cause foresters to appreciate the importance of what First Nations people regard as spiritually significant sites. Each summer on Gabriola Island B.C. there is an “oceans festival” where learners are invited to attach spiritual and other meaning to waterscapes, the seabed, marine mammals and other creatures found at sea. The focus here is on what the ocean means.

Others in this world view include the Swedish phenomenographers (Marton, 1981; 1986) and the notion of andragogy (Knowles, 1980) which has considerable regard for the way adults construe their experience within an independent self concept. There is a flourishing brand of psychology concerned with discourse anchored in humanist world view

(e.g. Harre and Gillett, 1994; Potter and Wetherell, 1987) that pertains to research where investigators try to see discursive formations that limit or enhance the learner’s capacity for education.

Natural Resources Education

A humanist natural resources education program would manifest respect for ways in which people differentially construct meanings attached to, say, fish and fishing, trees and forestry, rangeland and pasture. There would be a foregrounding of and respect for the perspectives of indigenous people and others who fall outside the dominant white, usually Eurocentric, male constructions of natural resources and western notion of progress and development. Examples from within this world view include bioregional mapping (Aberley, 1993) and an “ecology of hope” (e.g. Bernard and Young, 1997). In these programs there is respect for subjectivity but no significant challenge of extant power relations.

RADICAL HUMANISM

Radical humanists want to upset extant power relationships but are anchored within a subjectivist ontology. Those in this paradigm are usually anti (or post) positivist. But, unlike humanists, radical humanists want to overthrow or transcend existing social arrangements. Many radical humanists employ concepts developed by the young Marx to describe how people carry ideological superstructures which limit cognition and create a false consciousness which inhibits fulfillment. Radical humanists want to release people from constraints - which largely reside in their own cognitions. They seek transformation, emancipation, and critical analysis of modes of domination. They want people to reconstruct their view of reality and take appropriate action. Thus education involves praxis (reflection followed by action).

Related Theory

Popular education and Freire’s (1972, 1985) notion of conscientization are the clearest exemplars of this world view. Participatory research, popularized by the International Council of Adult Education, springs from similar ontological and ideological roots. Advocates of participatory research are critical of the top down nature of much university or traditional research. Their second apprehension concerns research that has insufficient regard to ways in which people subjectively construe their world, relying instead on the imposition or use of “external” values or measurement devices. Participatory research is based on praxis - reflection followed by action. It tends to unmask and then attempt to do something about unequal power relations.

Giroux’s (1983, 1988) and Aronowitz and Giroux’s (1991) analyses of resistance theory are other examples. Dropout from education or unwillingness to believe scientific “facts” has

typically been explained from an individualized “blame-the-victim” perspective. The learner dropped out or resists because of a lack of motivation, inferior intelligence or a bad attitude. But, resistance theory turns this on its head and there is persuasive research that demonstrates how “dropout” is often a political act or resistance. A parallel in natural resources education is where an indigenous group dismisses or actively resists “scientific studies” and its claims about “objective reality” and “truth” and, as such, render illegitimate local, indigenous or non-objectivist perspectives.

Most movements that employ education for cultural revitalization, whether amongst Maoris in New Zealand, Indians in Latin America or the Lap people in the Nordic countries, are informed by radical humanism. Education informed by this perspective has immense respect for local and culturally constructed “ways-of-knowing” and is committed to a transformation of consciousness.

Feminism is interesting because although some feminist scholars claim commitment to a subjective ontology there have been recent elaborations of more objective feminisms and a discernible sharpening of interest in marxist or structural feminisms (see Nicholson, 1990). Hence, in Fig. 2 feminism in radical humanism zone has a leg in radical functionalism. There is also an exceedingly active branch of feminism nested in the postmodern.

Critical theory (Geuss, 1981) is also rooted in this world view. Critical social theory refers to a brand of western marxism and is exemplified by a range of writers but most notably Habermas and others associated with the Frankfurt School. Collard and Law (1991) describe the impact of critical theory on the New Left in the late 1960’s and its preoccupation with subjectivist ontology. They claim that while critical theory influenced New Left politics (e.g. environmental activism) its influence on the academic analysis of education was muted until Freire’s (1972) concern with the need to build a critical consciousness reached North America. These days Freire’s neo-marxist radical humanism, partly derived from the work of Fromm (1941, 1949) has an enormous influence in North American graduate programs. For those wondering about how to translate critical theory into research methodology there is an analysis, with practical suggestions by Morrow and Brown (1994).

Critical pedagogy is another radical humanist orientation significant for natural resource educators. Activist intellectuals gathered under this banner advocate educational reform and draw sustenance from critical theory and Freire and, in recent years, post-modernism. They claim traditional education systems primarily serve the interests of corporate elites (Korten, 1995) and, in recent theoretical elaborations, slammed the insidious inclinations of popular culture, global advertisers (such as Benetton) and predatory trans-national corporations involved in extracting natural resources. Recent representations of critical pedagogy include *Politics of Liberation*

(McLaren and Lankshear, 1994), *Critical Literacy* (Lankshear and McLaren, 1993), *Paulo Freire: A Critical Encounter* (McLaren and Leonard, 1993).

Natural Resources Education

A good example of approaches to natural resources education informed by a radical humanist perspective is Freire’s (1985) analysis of cultural action and agrarian reform. It would be a mistake, he claims “to reduce this transformation to a mechanical act by which the system yields a new system ... as when someone mechanically substitutes one chair for another agrarian reform demands permanent critical thinking focused on (the) act of transformation and its consequences” (1985, p. 29).

Irrespective of whether plans are derived from “technicists” or peasants agrarian reform is culturally conditioned (Freire, 1985). Those committed to an objective reality should not view peasants as “empty vessels into which one deposits knowledge. Quite the contrary, they too are subjects of a process of their own beliefs.” Hence “an increase in agricultural production cannot be seen as something separate from the cultural universe where the increase takes place” (1985, p. 30)

Another example of education about natural resources from within a radical humanist perspective is the work of DAWN (Development Alternatives with Women for a New Era). In their programs of education this feminist group in India deploys an analysis that shows how class and gender are complicit in the production of systemic crises involving natural resources (Sen and Grown, 1987).

A similar emphasis is in the work of LEAP, the “Learning for Environmental Action” project of the International Council for Adult Education, publishers of *Convergence*² which carries articles on natural resources and education constructed from within a radical humanist world view.

Another valuable perspective is found in the radical humanist perspective of Rahnema’s (1997) *Post Development Reader*. This book contains chapters by leading theorists of natural resources education as well as critics like Illich. It deploys a Third World perspective to question meanings ascribed to development and Western ideas concerning progress. In an earlier but equally critical radical humanist perspective Roxborough (1979) attacked the tendency to make massive generalizations about the relationship between natural resources and development and, to illustrate his point, examined underdevelopment in several Latin American countries.

RADICAL FUNCTIONALISM

Radical functionalists share fundamental assumptions that buttress functionalism but are committed to the overthrow of social structures that build “false consciousness.” If radical

humanists focus on consciousness and meaning, radical functionalists focus on structures, modes of domination, deprivation, contradictions within an objective social world. Education construed from within a radical functionalist perspective would show how struggles over natural resources arise from objective socioeconomic circumstances.

Within this world view are those who focus on deep-seated internal contradictions within society while others focus on power relationships. But common to all theories here is the notion that each society is characterized by inherent conflicts and, within these, lie the basis of change. The later Marx was the chief architect of this position.

Related Theory

A good example of this perspective was Bowles and Gintis's (1976) analysis of *Schooling in Capitalist America* wherein the authors show how social and educational structures reproduce elites and underclasses. In the U.K. writers at the Centre for Contemporary Cultural Studies at the University of Birmingham link a critical radical functionalist perspective to the particularities of everyday experience. They claim all experience is "vulnerable to ideological inscription" but maintain that theorizing outside of everyday experience (the material facts) produces work that is overly formal and deterministic.

Good examples of a fusion of radical functionalist and postmodern sensibilities are Willis's (1977) *Learning To Labour* - about how working-class kids learn to accept (and not challenge) their class origins. Another example, on a similar topic was *Knuckle Sandwich: Growing Up In The Working-Class City* (Robins and Cohen, 1978).

Natural Resources Education

An example of a radical functionalist perspective on natural resources is found in the work of the Highlander Folk School in Newmarket, Tennessee. A materialist analysis of issues pertaining to natural resources is Gaventa's (1980) *Power and Powerlessness: Quiescence and Rebellion in an Appalachian Valley*. In this book the author shows how corporate and structural power has as much to do with preventing decisions as with bringing them about. Gaventa shows the linkage between state and corporate power and examines the "culture of silence," powerlessness and loss of natural resources experienced by workers and other residents of Appalachia.

FISHING WITH ATTITUDE

Thus far we have argued that natural resources educators consider adopting the principles of innovative learning, have regard to the possibilities of and pitfalls associated with the collapse of boundaries (between face-to-face and off-campus education) nested in the notion of distributed learning and, most

important, produce program content and pedagogy that reflects a theoretical perspective broader than the "scientism" of functionalist ideology and theory.

Natural resources education must embrace a broader array of perspectives and phenomena. A focus that reaches beyond a functionalist perspective would draw less on curriculum materials (typically contained in ring binders, lecture notes and handouts) and more on the individual and collective experience of learners. Excellent case studies are available and a theoretically expanded approach to education would spawn programs and approaches that are experiential and participatory and likely involve exploration of issues pertaining to class, race, gender, culture and other aspects of power and ontology.

"Natural resources" means one thing in the U.S. and something different in Canada and other places. However, fishing is on everyone's plate. Some of the most acrimonious discussions concern the need for international action to save species and, in Canada, a way of life that goes back 500 years. Although fishing and over-fishing differ from place to place, most folks are aware it is a problem. Teaching about fishing involves much more than natural "science."

Fishing is currently the lead-issue in B.C. politics³ and the author knows something about it. Hence, if we agree that functionalism has limitations and, as university teachers, want to cast a bigger net - sufficient to reach humanist, radical humanist and radical functionalist perspectives, what would pedagogy look like? To bring the foregoing analysis down to sea level we now visit four classrooms with different teachers in each.

Functionalist Fishing

Despite the fact commercial fishing is a contested matter involving claims from different nations, aboriginal groups, local and foreign fishers, when taught from within a functionalist perspective, it is rendered as a matter for "science." After scientists find "the truth" politicians will be advised and encouraged to make the "right" decision based on "the facts."

The functionalist teacher will have heaps of "data" - much of it from corporate, government and university sources - give erudite lectures and, using technologies, shows "facts" pertaining to different species, migration patterns, catch rates for different gear types and, for extra fun, graphs showing pesky problems caused by El Nino. Education is based on a "transportation" or "banking" model. There is a body of information to be moved. "Facts" will be communicated, probably through a lecture, with the occasional video or guest speaker to liven things up. The participants are passive, their views are not relevant.

The teacher is the expert; the learners are passive recipients of information and "knowledge." The First Nations learner in

the back looks uncomfortable but had better know “the facts.” The women also look unhappy. But these are scientifically-derived “facts” and what different kinds of learners might think is beside the point. The “facts” are legitimate because people who gathered them all have research grants and Ph.D’s. Fishing is akin to “going to war.” Although nobody says so, there is a sense in which fishing is a “man’s world.”

If this teacher was told “there’s more to it” he or she would likely say “I just teach the facts ... this is ‘tested’ knowledge Are you suggesting I start stating my own opinions ... pretty soon I’d be into politics.” However, this teacher is already deeply immersed in politics of the kind that support extant power relations. The insistence that “facts” are neutral, benign or derived from science ignores the context and power/knowledge ‘regimes of truth’ nested in his or her discourses. Moreover, their wagon is hitched to modernism and the widely-disputed notion that “enlightenment” and “progress” can be wrought from science. Since World War II the modernist project has become an increasingly ramshackle wagon and some of the most stunning intellects of the late twentieth century (e.g. Foucault, 1977; Miller, 1993) claim the wheels have already fallen off.

Humanist Fishing

Same classroom, different teacher. According to this teacher the fishing “problem” stems from the male proclivity to try and “subdue” or “conquer” nature. Considering fish as objects to be “harvested” reduces them to mere economic units. In this class, learners work on case studies, make visits and get to meet indigenous and other people who regard fish as more than an economic unit to be harvested.

If this classroom was in British Columbia, Alaska or Washington State the teacher would have learners read books like Drucker (1965) *Cultures of the North Pacific Coast* about the meaning and significance of First Nations fishing rituals and rhythms. As well, they’d examine Hutchison’s (1950) landmark volume about a fishing river *The Fraser*. They might also look at Blyth’s (1991) analysis of B.C. salmon canneries and their meaning for coastal life. For an understanding of what fishing means to the fisherman the student could learn from Iglauer’s (1992) charming study of *Fishing With John*, Jensen’s (1995) *Saltwater Women* and Haig-Brown’s (1993) lavish *Fishing For A Living*. Apart from reading which is a solitary activity, learners would do projects wherein they develop an appreciation for multiple meanings ascribed to fish and fishing.

Radical Humanist Fishing

“Scientism” doesn’t occupy much space here. Learners come from contrasting backgrounds and struggle to establish the legitimacy of different viewpoints. They variously come from coastal First Nations, Balkan countries, Scandinavia or, has been the case in B.C. in recent years, Vietnam and other Asian

countries. Whilst the learners and the teacher ascribe different meanings to fish and fishing (the ontology axis), they are committed to change (the power relations axis).

The present situation cannot continue. From within this theoretical perspective, change will not be wrought from a full-frontal attack on fish companies or government. Rather, the purpose in this class is to critically reflect on the nature of the problem and then, with new meaning perspectives in place, organize for action. The operative word is praxis (reflection + action).

To the outside observer, this is the most interesting of the four classrooms. Most talking is done by the learners not the teacher. The teacher appears to act as facilitator. Learners work in groups and use cards, sheets of paper or other devices to make varying responses to questions or tasks set by the class or teacher. When it comes time to report back to the larger group the teacher probes for the deeper meanings that lay behind the drawings, words or stories presented. There do not appear to be any right or wrong answers - only varying perspectives on the problem. Most importantly, the teacher is respectful and inclusive. He or she ensures all points of view are recorded and analysed. The learners are animated, active and appear to be enjoying themselves.

Mr. Nervous is disturbed when, about half way through this activity the teacher asks learners to elaborate a plan of action based on their earlier analysis of and reflection on the problem of fishing. One is heard to say that it is not the role of the university to encourage “politics” or action. However, a companion reminds Mr. Nervous that this class is being “taught” (i.e. facilitated) from with a radical humanist perspective.

“Well who does he think he is Paulo Freire?” snorts Mr. Nervous

“Very likely,” says the friend

In this course the learners would deploy participatory techniques to learn about community control of natural resources. If in Canada there would be examination of the Evangeline Cooperative (Wilkinson and Quarter, 1996) on Prince Edward Island, the Antigonish movement in Nova Scotia with its charismatic leaders (Lotz and Welton, 1997) and, in B.C. the *Pacific Coast Fishermen’s Mutual Marine Insurance Company* (Sorbo, 1995).

Radical Functionalist Fishing

In this classroom there is a focus on the “objective facts” of fishing. But they are not the same as those shown in the functionalism class. Instead, the focus is on corporatism, who owns what, a history of appalling labour relations, the mistreatment of workers, attempts at union busting, the misuse of foreign workers in fish-packing houses and “rape of the sea.”

The instructor is heard to say the fishery is being destroyed by predatory capitalism. But despite the fact the instructor calls for the emancipation and empowerment of workers, smaller family-owned fishing vessels and elimination of “vacuum cleaner” company owned druggers, trollers and seiners, the teaching techniques are like those of the functionalist. [Some of the most oppressive teaching techniques are deployed by those espousing emancipation].

However, the reading list is provocative and there is much from a union or workers point of view. For these authors there’s much more to fishing that catch-rates, gear types and objective science. There are readings from Marx, Habermas (1971), critical theorists, historians and political economists, First up is Meggs (1995) *Salmon: The Decline of the British Columbia Fishery* and Meggs and Stacey’s (1992) *Cork Lines and Canning Lines*, a critical study written from a political economy perspective. Next is Glavin’s (1996) *Dead Reckoning: Confronting the Crisis in Pacific Fisheries*. In the foreword to this critique of fisheries science and expose of political fumbling, environmentalist David Suzuki bemoans “alarming signs of environmental degradation” and says it is “clear that the economy and social issues are inextricably inter-twined.” This is not news for natural resource educators but, in this course, the instructor persistently foregrounds the issue of power and focuses the teaching on who is doing what to whom and “who benefits?”

In the groupwork and case studies examples are drawn from local struggles but filtered through a neo-Marxist or critical theory lens. There are special efforts to include the voices and perspectives of marginalized groups typically “written out” of university coursework (e.g. indigenous people, women, workers). The focus is more on material facts than subjective constructions or meanings ascribed to fishing. However, like in the radical humanist room, an action plan is developed.

CONCLUSION

Natural resources and their management lay at the centre of political debates all over the world but particularly in large countries with resource-extraction economies. As such, numerous interests are involved, there are many competing claims and it is not possible (and nor should it be) for natural resource educators to take refuge in protection afforded by the dubious “certainties” and “truth” of positivist science. Universities are changing. Although change can be scary and debilitating, it also presents opportunities to practice a more engaged, participatory pedagogy.

In this paper we have argued that because tomorrow will not repeat yesterday or today there is a need to supplement maintenance learning (the learning of fixed rules for recurring patterns) with what the Club of Rome called innovative learning. Innovative learning involves anticipation and participation. Next, we showed how distributed learning is leading to a break-

down of the distinction between face-to-face (on-campus) and off-campus education. We welcome the Web but question the extent to which it will democratize education.

Lastly, we claimed that education about natural resources is political. We questioned the hegemony of functionalist discourse that constructs pedagogy in most natural resource departments. We showed how this discourse, with its recourse to “science” and “facts,” is also political. For the purposes of this argument we deployed a model where “power relations” were in a vertical and “ontology” in a horizontal axis. Four world views are nested in the zones of this map..

We did not say functionalism should be ditched but suggested natural resource educators deploy a broader array of theoretical perspectives than is the case at present. Constructing pedagogy within the framework of humanism, radical humanism and radical functionalism produces contrasting perspectives concerning program content and teaching techniques. We illustrated how program content and teaching techniques by visiting classrooms where the teaching/learning process was informed by one of the theoretical perspectives canvassed here.

We expect a bimodal response to this analysis. For one group, it will be disturbing and even repugnant to contemplate the depth of engagement implied by the three alternative perspectives. But, in natural resource education, functionalism no longer exerts the authority it once had. Another group will share our apprehensions about how much “progress” that can be wrought from further fine-tuning of a functionalist perspective.

Many natural resource educators already deploy a participatory, respectful and engaged pedagogy and have willingly embraced subjectivist ontology. Exciting pedagogy resides in the alternatives and high levels of satisfaction can be derived from trusting learners, involving them and foregrounding their perspectives on power relations and reality (ontology). Moreover, an embrace of the future (innovative learning) replaces perambulations about the past and is probably a necessary corollary of planetary survival.

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³ Roger Boshier was a New Democratic Party candidate in the 1996 British Columbia elections. "Fishing" was at the centre of what turned out to be a closely fought election campaign where the NDP prevailed with a slim majority.

⁴ New Society Publishers have a large catalogue of books broadly framed by a Humanist or Radical Humanist worldview. P.O. Box 189, Gabriola Island, B.C., V0R 1X0, CANADA [http://www.swifty.com/nsp/]