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Re-examining the Importance of Indigenous Perspectives in the Western Environmental Education for Sustainability: "From Tribal to Mainstream Education"

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Abstract

This paper highlights the importance of integrating indigenous perspectives on environmental sustainability into mainstream education as a way of bridging the gap in the understanding of indigenous knowledge systems into Western science explanations of sustainable development (SD) in education, at the same time ensuring traditional ecological knowledge (TEK) continuity for future generations as well as taking a steady stand in the global debates on SD. The first part of the paper will attempt to explore the issue of SD through Western and indigenous perspectives and will emphasise on the model of strong sustainability (in theory). Secondly, the importance of TEK will be examined and justified through case studies on Aboriginal peoples of British Colombia and Roviana people of Solomon Islands in achieving goals of sustainability. Thirdly, challenges for TEK will be investigated and some possibilities of protecting the rapid disappearance of indigenous knowledge will be dealt with. Lastly, a pedagogical approach to sustainability will be provided that postulates the relevance of indigenous pedagogy to formal and informal education, attempting to integrate Tilbury's (1995) characteristics of environmental education for sustainability.

Keywords: sustainable development, indigenous perspectives, Western science, traditional ecological knowledge, environmental education for sustainability

Introduction

Modernity is a form of 'social organisation' that dominates most societies of the world today. It originates from the 17th century Europe with an evolution embracing the interrelatedness of the economic, political, cultural and social orientations (Huckle, 1996). The rise of capitalism led to the rise in demand for land which resulted in the breaking up of social institution that supported cooperative and sustainable land use. Land became a product for sale and a source of private wealth. The rise of capitalism initiated nation states and governments to create and protect property rights for capital accumulation. The centralised and bureaucratic forms of governments used their demo-

cratic powers to salvage environmental protection operations however, the unequal power distribution favoured business interests to get the maximum value out of the environment.

As Huckle (1996) points out sustaining capital accumulation and the living standards of majority of the elites often poses constraints for sustainable development (SD). Modernity is a product of revolutionary change as a result it has broken down the traditional world views that were concerned with the interconnectedness of all living and non-living things, generating respect for nature that is contained in traditional and local wisdom which serves to the sustainability of the environment (Huckle, 1996). The disorganised capitalism led to the fragmentation of the equilibrium state of nature and cultural traditions of society. The results show that the last 500 years of mechanistic and scientific world view has promoted domination and manipulation of nature which has led to severe environmental, social and economic crisis.

Post-modernity rests on the foundations of insecurity and uncertainties due to mass consumption which challenges species and natural resources survival. However, Huckle (1996) argued that a constructive postmodernism can solve the problems of modernity by coming in terms with the limits of positivism and technocracy through exploring other kinds of knowledge. "A constructive post-modernism can put society back in touch with nature and cultural tradition and so end the alienation induced by the rise of modernity" (Huckle, 1996, p. 9). The problems of modernity and a realisation for sustainability make it vital to recognise indigenous knowledge and cultural perspectives to help to solve ecological problems. The objective of this paper is to highlight the role of indigenous knowledge systems in the fight towards ecological sustainability, outlining its strengths for education and for sustainable practices at global level.

What does SD Mean?

Origins of SD

The principle of SD under the Western world view is built on the ideological separation of people and nature underlying free-market democracy. Under free market economy, development reflects the idea of promoting well-being. Also, sustainability is a recognition that the goals of economic growth are in tension with nature. The Western ideology of SD has been universalised through international legal principles which are problematic, as such an ideology has serious implications to nature and therefore a need to recruit valid explanations from different societies of the world so that the problem could be analysed through different societal lenses.

The debate on SD is about reconciling economic development with environmental conservation (World Commission on Environment and Development [WCED], 1997). Given the important role of culture in defining, evaluating and managing economic-environment interactions, the cultural dimension is notably absent from the paradigm of SD. This is because the Western views of SD are guided by modernisation theory based on the principles of neoclassical economic – views of rationality, individualism, materialism and social hierarchy (Daly & Cobb, 1989). The west should leave the thought of superiority of their own ideas on SD, based on the history of the past and move forward in welcoming alternative perspectives from indigenous societies in finding a way forward.

Western Perspective

SD as a term first emerged from the World Conservation Strategy 1980 and was later reinforced by the World Commission on Environment and Development 1987 also known as the Brundtland Report (Fien & Tilbury, 2002). According to Fien & Tilbury (2002), "world conservation strategy primarily aimed at protecting essential ecological processes, life-support systems and genetic diversity through the sustainable utilization of natural resources" (p. 2). However the strategy linked poverty, development and environment, focusing on the rural people of developing countries who turn to over-utilise natural resources in order to solve the problem of starvation and poverty (Fien & Tilbury, 2002).

This report the problems rooted in social, political and economic aspects heightening environmental crisis. Through the influence of Brundtland Report and Agenda 21, SD got its footing in the international debate on environmental degradation, which helped to create policies at the local, national and international levels, programmes and strategies to mitigate the effects on the environment of development. Therefore SD is defined by the World Commission on Environment and Development (1987) as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (p. 15).

The development of the concept of SD originates from a Western paradigm where its interpretation and implementation reflects Western culture and values. Although it claims at solving global environmental problems of all societies, its solutions are defined through the Western eyes (McGregor, 2004). The term "sustainable development" is used interchangeably with the term "sustainability" in the literature, however, "proponents of both concepts are faced with the challenge of encouraging a shift in societal world-views in order to achieve the goals they promote" (McGregor, 2004, p. 73), threatened by increasing depletion of the world's natural resources and the degradation of the biosphere. According to McGregor (2004), SD from a Western perspective does not challenge the power imbalances between the Western and indigenous world in a meaningful way due to the ways the policies are implemented, which results in a loss of empowerment of indigenous nation. Indigenous nations TEK is not recognised as an integral part of achieving sustainability on its own but used within the framework of dominant Western agenda (McGregor, 2004).

The modern economic concept of SD undermines the ways of survival of indigenous people through generations of living with the environment; this is a result of the inherent tension between environment and economic aspects which adopts economic aspects for the survival of westernised nations, despite knowing its severe implications on the rest of the world. Advocating SD from a Western perspective as a way to integrate societies is problematic since indigenous people feel insecure with their traditional ecological knowledge to be applied within the framework of Western ideals thinking that it could be misleading. This goes back to the colonial history of the native societies, where colonial policies were aimed at benefiting the developed and natives were deprived of their indigenous land. However, this perspective of indigenous knowledge and its application is identified as a possible solution for achieving the goals of sustainable future (Tilbury, 1995)

Indigenous Perspectives

Western and indigenous perspectives are similar along the lines that both recognise the need to change from the current pathway of progress which is unsustainable. However, there are fundamental differences between the two world views. Indigenous world view is linked to the romanticised explanations of how people are connected with all creation. It is based on the stories of creation which explains key understanding of their place in the world. It provides the foundational teachings and lessons on how humans are related to the rest of the world. Therefore McGregor (2004) states that indigenous views of survival are based on giving not taking; thereby building a personal sacred relationship with creation and the way of living is based on protecting and enhancing this relationship with all creation.

McGregor (2004) explains that indigenous people regard creation as a gift and "to be sustainable means taking responsibilities and being spiritually connected to all of creation at all times" (p. 77). This responsibility is carried by both people and animals; therefore all elements of creation play a significant part towards the natural equilibrium of the environment. McGregor (2004) further elaborates that "sustaining, maintaining and enhancing relations with all creation is of utmost importance from an indigenous point of view" (p. 77). It is worth noting that an essential rule that emerges from creation stories is that "no one can interfere with the ability of the elements or beings of creation to perform their duties" (McGregor, 2004, p. 77) as this threatens sustainability. Based on the above explanations of indigenous perspectives (McGregor, 2004), it is evident that SD under this world view is based on the survival of all the elements of the world, through their prolonged relationship and indispensible affiliation towards the maintenance of all creation.

To have a better understanding of the indigenous world view, it is essential to investigate the indigenous knowledge systems which can be traced back through the colonial history of the colonised. The ethnographical basis of indigenous knowledge reflects compromised efforts, strengths and perseverance in day to day survival and generations of experimental living with nature. Indigenous history is of oppression and their survival is dependent on tradition and beliefs in ancestors and prayers. The rich knowledge systems of particular indigenous groups have provided active resistance methods and a process of reclaiming their traditions overtime, and as McGregor (2004) reveals "resisting and reclaiming form an integral part of the concept of sustainable development" (p. 77), which relates closely to the cultural component of sustainability.

This strong sustainability model ensures that SD should emphasise on a continuing and holistic approach to integrating economic, environmental and social/cultural elements (Figure 1). It attempts to resolve the conflict between economic prosperity, environmental equality and social equity (Econation, 2010). The strong sustainability model ensures that the environment is a self-contained system and society and the economy are the dependent subsets of the environment (Sustainable Aotearoa New Zealand Incorporated [SANZ], 2009). Strong sustainability controls human activities and reiterates societal ethics and values which aim at the rejuvenation of ecosystems' resources thereby providing wise consumer choices and controlling market operations (economy) based on producing environmental friendly goods and services. In this way, society controls the economy and the environment controls the society, therefore assuming that what is good for the environment should be good for society and the economy. The strong sustainability model illustrates the working relationship of people with other elements of the world, which is the central idea of TEK.

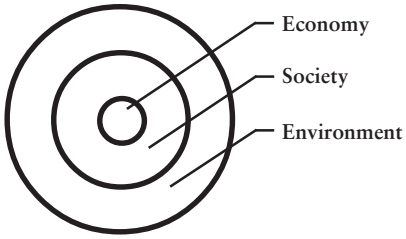

Figure 1. The strong sustainability model (Lutzkendorf & Lorenz, 2005)

Keeping strong sustainability in mind the next part of the paper looks at TEK and how it is developed and maintained through generations of living with the environment for a number of indigenous groups. It is important to point out at this stage that traditional knowledge is not consistent or the same across different indigenous groups. Some studies show that traditional knowledge has been unsuccessful in maintaining their sustainable procedure and practices in the current times (Howard & Widdowson, 1996), however, I feel that there are some grounds for its justification and successful application in some societies.

TEK

TEK is a body of knowledge and beliefs transmitted through oral tradition and first hand observation. It includes a system of classification, a set of empirical observations about the local environment and a system of self-management that governs resource use (Emery, 1997). Ecological aspects are closely tied to social and spiritual aspects of the knowledge system. The quantity and quality of TEK varies among community members, depending on gender, age, social status, intellectual capability and profession (hunter, spiritual leader, healer etc.). With its roots firmly in the past, TEK is both cumulative and dynamic, building upon the experience of earlier generations and adapting the new technological and socio-economic changes of the present (Emery, 1997).

TEK is a 'way of life' of a group of people where a special attention is given to the actual living of life of indigenous people in a particular time period. According to Battiste and Henderson (2000), TEK is localised and social. It focuses on building a web of relationships between different elements of the world within a particular locality, therefore this knowledge is original and is based on specific models of species interactions in a small geographical setting which provides better explanations for the physical changes of the environment in that area than compared to Western science explanations which is mostly based on global generalisations.

Traditional ecological knowledge is a dynamic but stable knowledge system which keeps on renewing from generation to generation through individual observations, comparing current experiences with past generation experiences, thus conducting experiments and testing through day-day interaction with the environment, which is done to test for the reliability of their knowledge and sharing findings with others (Battiste & Henderson, 2000). This shows that this knowledge system is re-examined by each generations, at an individual and community level, to test for its current validity, which reflects empirical self-consciousness of individuals. Now, it becomes important to examine and justify the successful application of traditional ecological knowledge in some societies through Aboriginal people of British Colombia and Roviana people of Solomon Islands.

Case Study 1

Turner, Ignace and Ignace (2000) discuss TEK and wisdom of aboriginal peoples of British Colombia by looking at the traditional practices of *shuswap,* Interior *Salish* and *Kwakwaka' wakw* and *Nuu-chah-Nulth* groups, and it is noted that aboriginal practices are based on a "dialectic relationship between those practices and its people's belief systems" (p. 1276). For instance, these groups' plant resources are managed at three levels: *population* – placing emphasis on the number of a plant species while harvesting it; *habitats* – using fire to create and maintain successful stages favourable in the productivity of a complex plant species and *landscapes* – a variety of strategies are used which includes, "seasonal rounds, conventions over resource ownership, culturally mediated prescriptions for humans, relationship between plants and animals, determine landscape development" (Turner et al. 2000, p.1277). The techniques used to preserve plant resources in these communities is based on the virtue that plant species are '*perennial*', therefore plant harvest depends upon what it will be used for, therefore, according to Turner et al. (2000), "unless an entire tree is required for construction or canoe making, individual plants are not generally destroyed" (p. 1277). On other circumstances where parts of a plant has to be used, harvesting only takes place from those plants that have the ability to regenerate (Turner et al., 2000).

Turner et al. (2000) also points out how some trees are harvested in large quantities, but the productivity of population is maintained through the use of various strategies. For example, the inner bark of Western red-cedar and yellow cedar is harvested in big quantities for basketry, mats and clothing, without using more than one third of the tree's circumference (outer birch bark is used), and the tree continues to regenerate and live. These barks are used in a range of products from handmade goods to edible tissues and medicine. This is a result of successful pruning and branching of plants as, for the root vegetable harvest, the whole corm is removed to increase propagation. In these communities, the emphasis is placed on selective harvest of plants keeping a well maintained forest cover, pruning and burning of selected fields for long-term yields. When harvesting seafood high significance is placed on the ecological indicators for population health. For example, the number and size of different fish species found can be used as an indicator of biodiversity. People of these communities have a direct authority system by leaders who manage and control resource use based on survey and observations as they decide when to announce harvest for their people.

Case Study 2

Another example of TEK practice is through fishers' knowledge in Western Solomon Islands. According to Lauer and Aswani (2009), practices of Roviana fishers are examined through an on-going marine conservation project. Under this study, the Roviana ecological knowledge of fishers challenge the current models based on the cognitive aspects of knowing. This project shows how local knowledge could be applied with a scientific approach to develop hybrid methodologies, where fishing practices, socioeconomics and demography are all integrated into geographical information systems. Roviana knowledge was used in the production of habitats and benthic maps, identifying common fishing sites for spawning and the locals identified the fish species in the area. The project showed how through ethnoscience local people "explore, understand, conceptualize and categorize local ecologies" (Lauer & Aswani, 2009, p. 319).

According to Lauer and Aswani (2009), Roviana fishers' engagement, interaction and close attention from their canoes to the undersea environment is important in "interpreting the patterns, textures of features and substrates underneath them to determine their position and navigate the seascape in finding fishing grounds" (p. 325); hence this interaction helped them in enhancing their visual skills. The Roviana fishers are capable of interpreting air photos and satellite images which they acquired through accumulation of knowledge based on years of fishing and navigating experiences. This study highlights that the epistemology and ethnoscience of Roviana understanding was consistent with that of the practise approach, and it integrated a quantitative framework to test its suitability with the Western scientific knowledge. The findings of Lauer and Aswani (2009) suggest that a local practice-based approach is systematic and informative in understanding of knowledge than cognitive models and calls for more research in developing approaches and methods for knowing and understanding indigenous knowledge, through variety of methodologies and a multiple theoretical framework.

Challenges for TEK

According to McGregor (2004), there is an environmental science dilemma, where traditional knowledge, in spite of its successful application in some societies, corresponds poorly with the Western explanations of the phenomena, because traditional knowledge is not intellectually developed through institutionalised practices. As a result, environmental scientists find it non-systematic, non-quantitative, which is mostly metaphorically based and lacking cognitive aspects of explanations. Since indigenous knowledge is tested in narrow geographical settings, Western science is not convinced if it could be successfully applied in the global context. Breidlid (2009) adds that indigenous knowledge systems provide romanticised explanations of the world which could be inadequate and misleading in situations of rapid change. There is a call for a critical exploration of the traditional knowledge system towards its validity for achieving SD at a global level.

McGregor (2004) argue that cultural disruption in native communities, which is a result of colonisation, has led to the degrading of local knowledge systems. Therefore a need to revitalise native communities to maintain and develop the existing knowledge and regain the lost ones. It is also evident that the dialogue regarding the importance of using TEK is currently performed in English, which could cause severe complications in its translation from a native language into English thereby compromising on its understanding for non-indigenous people from the Western world. McGregor (2004) recognises that there is a power imbalance between the two groups which means indigenous people, who hold the knowledge are vulnerable to exploitation and the existing structure of environmental bodies for SD, provides limited provisions for the safety and continuity of indigenous knowledge.

Possibilities of Global Acceptance

It becomes crucial to integrate indigenous knowledge systems into Western science so that a better understanding is achieved when dealing with the problems of unsustainability for all societies of the world. As outlined by McGregor (2004), indigenous people must control their own information, but, since their knowledge base is dynamic, vital and evolving, there is a tendency for this knowledge to be lost, because written records

are not kept. Moreover, the process is oral. McGregor also points out that indigenous people must not support 'salvage' operations towards the recovery of lost knowledge, but they must ensure that the information gained reflects the relics of the past. As we know that traditional knowledge is holistic, indigenous people must ensure that they do not compartmentalise it to the topic state for scientific exploration as it has to be understood as a whole through day to day living experiences with the environment.

There is a need for transformative action through environmental education for sustainability (EEfS) in schools and non-governmental organisations' (NGOs'). Also environmental campaigns must ensure the respect for indigenous world views and enhance ways in which it could be further tested for reliability of the knowledge to be used at a global level through community participation in projects, especially designed using indigenous methods and knowledge.

There is a need for transformative action through EEfS in schools and NGOs. Also, environmental campaigns must ensure the respect for indigenous world views and enhance ways in which it could be further tested for reliability of the knowledge to be used at a global level through community participation in projects, especially designed using indigenous methods and knowledge. Battiste and Henderson (2000) identified the need for convention laws, protecting indigenous knowledge and heritage through an appropriate agency at an international level, which should be given equal acceptance with Western legal regimes.

Since the challenges and possibilities are recognised for traditional ecological knowledge, now it becomes necessary to come up with some relevant pedagogy to enhance the successful application of this knowledge in society through formal and informal education. The pedagogical approach in the successful application of TEK is the final part of this paper, therefore I aim to integrate the characteristics of EEfS in its explanation.

The Pedagogical Approach

> *We need a pedagogical strategy that is based on scientific knowledge and social experience among other factors, that establishes organised collective action towards clear ends ... only in this way will individual action become meaningful and contribute to overcoming the current state of things* (Gonzalez-Gaudiano & Meira-Cartea, 2010, p. 36).

EEfS must promote a holistic view of education through the transformation of the education system from reductionist approaches of teaching to a more child-centred tradition or place-based education rooted in inquiry learning. Pedagogies should encourage ethical relativism where students' should be given a chance to compare strengths and weaknesses of different value systems and look at alternative ethical positions to nurture environmental ethics (Sterling, 1993). EEfS should begin with the existing knowledge of the child, where the pedagogy employed should assist in the ability to recognise the problem and to develop a sense of responsibility for a need to participate in the process of change, in other words, it should focus on the child's readiness to learn, emphasising on 'relevance' – a central principle of EEfS where students are involved solving in world problems.

Students should be taught appropriate skills and knowledge to undertake responsibilities as citizens and as members of the community, where they critically evaluate

information based on their traditional knowledge and school science. This makes the learner acquainted with a variety of appropriate skills for action, which portrays environmental action by Tilbury (1995). Another way of enhancing traditional ecological knowledge is information sharing through community environmental awareness programs. This practice could keep youths involved in practising their cultural ways and using TEK enables them to understand changes to the knowledge systems and the environment (Fuhker, 2002).

EEfS must also ensure that programmes are based on responsibility towards our biosphere rather than focusing on past mistakes, where students find their own ways to protect and improve the environment (Fuhker, 2002). In this way, the whole picture surrounding the problem is being investigated demonstrating a holistic approach to learning. EEfS must ensure that "there is no separation between teaching and learning as everyone does both" (Fuhker, 2002, p. 51) by sharing their traditional and Western experiences in groups. Developing this holistic approach to learning through "personal environmental ethics, valuing social responsibility, concern for others and harmony with nature" (Tilbury, 1995, p. 210) reflects value education.

Fuhker (2002) explains that the participants of EEfS programmes must become resources for their own learning, and their effort to provide answers for each other should provoke the learning process at a deeper level, which further allows the participants to investigate issues that interest them. Therefore each individual plays a role in creating his/her own education. This approach to education offers issue-based learning and critical education, where it develops an action-oriented approach and politically literate individuals with critical skills for understanding complex issues and finding suitable solutions (Tilbury, 1995).

Traditional knowledge can be integrated into the mainstream curriculum across the curriculum content and taught through various subject topics that require students to undertake projects on local topics; thereby teachers' can focus on testing the relevance of this knowledge to the current curriculum outcomes, such as making connections to prior learning and experience. The use of an indigenous pedagogy should ensure that formal and informal education incorporates the learning of community approaches in sucessfully transforming all the areas of the civil society. Their application should reflect education about/in/for the environment using the head, heart and hands, demonstrating a three-fold approach to the EE (Tilbury, 2005). Tribal and village leaders should also encourage students and youths to form activists' groups to represent current actions and projects, taken to preserve indigenous knowledge, at national and global environmental conferences to enlighten people as to the reliability of the knowledge system. This shows the future dimensions for EEfS that could possibly promote empowerment and action by desiring a "greener economic, social and political society" (Tilbury, 1995, p. 207).

Final Comment

This paper takes a stand on integrating indigenous perspectives into Western EEfS in mainstream education. It explains the concept of SD through the Western and indigenous perspectives to provide a framework for discussion. Therefore, in this paper, I have attempted to justify the importance of traditional ecological knowledge and its useful application in some societies through Aboriginal peoples of British Colombia and Roviana

people of Solomon Islands which provides a basis for its validity in the literature on sustainability. The use of strong sustainability model is re-emphasised, which reflects the sustainable practices and is used to explain TEK of indigenous societies that places much emphasis on the environment. In this paper, I have also highlighted some possible challenges for TEK as having an independent stand on promoting sustainability and have provided some scenarios for its positive implementation in achieving global ecological sustainability. Lastly, I have provided a pedagogical approach where practices have been identified that could promote indigenous perspectives into formal and informal education, by integrating characteristics of EEfS into learning. The outcome of this paper suggests that, based on the case studies on some societies, the validity of indigenous knowledge systems still prevails, but more research is required in order to test for its application at a global level with Western scientific techniques.

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