



Culture, indigenous knowledge systems and sustainable development: A critical view of education in an African context

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In memory of my colleague, Professor Kevin Rochford, who was senselessly killed in front of his house in Cape Town in April 2008.

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ABSTRACT

The article's focus is the relationship between culture, indigenous knowledge systems (IKS), sustainable development and education in Africa. It analyzes the concept of sustainability with particular reference to education and indigenous knowledge systems. In particular the article analyzes the documents from the World Summit in Johannesburg in 2002 as well as from the United Nations Decade of Education for Sustainable Development. Moreover, the article discusses South Africa's Curriculum 2005 (C 2005) launched by the African National Congress (ANC) by focusing on the dilemmas of exclusively introducing Western-based scientific knowledge in a cultural context based on indigenous epistemology. The article concludes by calling for more research into the viability of indigenous knowledge systems as a potential tool in sustainable development.

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1. Introduction

1.1. *Mudzimu weshiri uri mudendere (Shona). (A bird's soul is in its nest.)*

The article explores the relationship between culture, indigenous knowledge systems (IKS), sustainable development and education in an African context. It first discusses some characteristic features of African (indigenous) worldviews and knowledge systems, and proceeds to analyze the concept of sustainability with particular reference to education and indigenous knowledge systems. Focusing on the relationship between sustainable development and different knowledge systems the article critically analyzes the documents from the World Summit in Johannesburg in 2002 as well as from the United Nations Decade of Education for Sustainable Development.

Moreover, the article analyzes South Africa's Curriculum 2005 (C 2005) launched by the African National Congress (ANC) by focusing on the dilemmas of exclusively introducing Western-based scientific knowledge in a cultural context based on

indigenous epistemology. The article further discusses how sustainable C 2005's understanding of sustainable development is since indigenous knowledge systems are only superficially referred to. By way of conclusion the article calls for more research into the viability of indigenous knowledge systems as a potential tool in sustainable development.

The rationale for the focus on the relationship between indigenous knowledge systems and sustainable development in this article is the overall low success rate of earlier Western-based development strategies in assisting the poor to escape their dismal conditions. Zoellick, the President of the World Bank, expresses his concern after the release of the latest Global Monitoring Report 2008:

In this Year of Action on the MDGs (Millennium Development Goals), I am particularly concerned about the risks of failing to meet the goal of reducing hunger and malnutrition, the 'forgotten MDG'. As the report shows, reducing malnutrition has a 'multiplier' effect, contributing to success in other MDGs including maternal health, infant mortality, and education (World Bank, 2008).

Particularly in Sub-Saharan Africa a real developmental take off does not seem to have materialized. Clearly the reasons for this are

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multiple, but arguably **one reason is related to the modernist development paradigm which both aid agencies and governments in the South have uncritically adhered to.** Western knowledge and science have played a hegemonic role in the developmental efforts in the South, whereas indigenous knowledge has been characterized as inefficient, old-fashioned and not scientific, and relegated to the realm of insignificance. As Sillitoe states: “The discrediting of existing knowledge and techniques (invariably subsistence-oriented and often environmentally well-adjusted and sustainable), and their replacement with scientifically informed and controlled technology, furthers outside hegemony (Sillitoe, 2000, p. 5).

2. Indigenous knowledge systems and sustainable development

Both due to the meager results of modernist interventions in terms of sustainable development in the South and the accelerating global ecological crisis, Western science and knowledge systems have been questioned and critiqued by a number of scholars and politicians in both Africa and Asia as well as in the West. Inspired by the African Renaissance¹ in particular, interest in and focus on world-views and indigenous cultures and knowledge systems in Africa as a supplement to what some call reductionist science and knowledge systems have led to an exploration of “the role of the social and natural sciences in supporting the development of indigenous knowledge systems” (Odora Hoppers, 2002, p. vii). Ntuli is correct when claiming that **indigenous knowledge systems are a counter-hegemonic discourse in the context of the African Renaissance** (Ntuli, 2002).

2.1. Local and traditional knowledge

This call for re-evaluation of modern and traditional knowledge systems is articulated in Odora Hoppers’ influential book *Indigenous Knowledge and the Integration of Knowledge Systems* (2002) as well as by a number of scholars who have done substantial research on indigenous cultures, worldviews and knowledge systems (Ogunnyi, 1988; Jegede, 1995; Hountondji, 1997). The important contributions of philosophers and theologians like Mbiti (1969) and Idowu (1982), have exposed the importance of metaphysics and religion in African epistemology whereas the Ghanaian philosopher Gyekye (1997) has analyzed African worldviews and cultures in terms of a tradition–modernity dichotomy. While Gyekye sees **culture as socially created and nurtured** meanings constituting “the greater portion of our necessary social context” (Gyekye, 1997, p. 44), Hofstede’s view is perhaps more internally oriented **as the collective programming of the mind** (Hofstede, 1991). Whereas social anthropologists define culture as encompassing both societal structures and ways of acting and thinking sociologists often make a distinction between culture and structure and where various groups have different access to power and resources. But separating culture from the structures of cultural reproduction fails to do justice to the mutually constituting dialectic of their relations, and if Kearney’s definition of a world-view is plausible, then the line of demarcation between culture and world-view is thin. He defines **world-view** as:

A culturally organized micro-thought: those dynamically interrelated assumptions of a people that determine much of their behaviour and decision making as well as organizing

much of their symbolic creations... and ethno-philosophy in general (Kearney, 1984, p. 1).

Crossman and Devisch (2002) emphasise this interrelatedness in their understanding of **indigenous, or as they prefer to call it, endogenous knowledge systems and world-views**, and characterise them in terms such as **holistic and organic, non-dominating, non-manipulative, non-mechanical (social and people-centered and relational)**. While Crossman and Devisch can be criticised for being normative and idealising indigenous knowledge systems, Odora Hoppers and Makhale-Mahlangu, in their definition of indigenous knowledge systems, may seem to tone down the metaphysical aspects of such systems by referring to them as

the combination of knowledge systems encompassing technology, social, economic and philosophical learning, or educational, legal and governance systems. It is knowledge relating to the technological, social, institutional, scientific and developmental, including those used in the liberation struggles (Odora Hoppers and Makhale-Mahlangu, 1998. Quoted in Odora Hoppers, 2002, pp. 8–9).

It is, however, imperative that African indigenous knowledge systems are understood in relation to a world-view which is to a large extent realised in religious ceremonies, rituals and other practices. Our fieldwork among the Xhosas in South Africa confirms such a view (for a comprehensive discussion of this fieldwork, see Breidlid, 2002). Even though there are aspects linked to indigenous, cultural practices other than religion, religion and religious practices are central to Xhosa epistemology. Chivaura’s comment on development in an African setting is worth noting:

The African worldview declares that our world has two aspects: They are the physical and the spiritual... The differences between African and European worldviews concerning earth and heaven relate to differences in their attitudes towards the material and the spiritual. Africans regard them as compatible ... The danger of adopting the European worldview to solve African problems is therefore obvious. It is hostile to our worldview and idea of development. African development can only be truly achieved through an African worldview (Chivaura, 2006, p. 217).

In the spiritual sphere the ancestors play an important role and are guarantors that the social and moral world will not collapse and that the solidarity of the group is still maintained. A very similar picture is painted by both Mbiti and Idowu of other ethnic groups across the African continent (Mbiti, 1969; Idowu, 1982). **The holistic nature of the interrelationship between nature, human beings and the supernatural is foundational in the Xhosa knowledge system.** As Chabal and Daloz state in an African, if not Xhosa, context: **“A crucial feature of African belief systems is the absence of a firm boundary between the religious and the temporal”** (Chabal and Daloz, 1999, p. 65). **A definition of indigenous knowledge must therefore both account for the holistic, meta-physical foundation (worldviews) of indigenous knowledge systems and their various ramifications.** Consequently indigenous knowledge systems encompass, I argue, world-views, cultural values and practices and knowledge systems derived from these worldviews and practices and related to metaphysical, ecological, economic and scientific fields. **This holism was in Europe undermined by the Protestant reformation (Delanty, 2000) which played an important role in the rise of modern science (and the separation between the secular and the spiritual) and thus in the advent of modernity** (Breidlid, 2002). Indigenous knowledge is delimited geographically and culturally in the sense that the emphasis is on

¹ Ntuli defines African Renaissance as a rebirth or renewal to overcome Africa’s current challenges and problems. This, according to Ntuli, “requires of us to re-examine our knowledge systems anew, with a view to extracting some lessons from our past to distil what can be of use at this current moment and what has to be jettisoned” (Ntuli, 2002, p. 54).

place, e.g. the homestead. Moreover, indigenous knowledge is, as Sillitoe argues, as “much skill as knowledge, and its learning across generations is characterized by oral transmission and learning through experience and repetitive practice” (Sillitoe, 2000, p. 4). **Indigenous knowledge poses an alternative to narrowly focused scientific disciplines which may neglect the interconnections of natural phenomena, for example in agriculture, that may promote sustainable development.** Contrary to what a Western discourse often seems to assume, **indigenous knowledge is often “flexible, adaptable and innovative”** (Sillitoe, 2000, p. 4), **but should not be interpreted and categorized within the realms of a Western paradigm.** Within such a paradigm “African worldviews and wisdom look like myth and superstitious metaphysics” (Chivaura, 2006, p. 219). **But post-colonial Africa has exposed areas in which indigenous knowledge systems are relevant and useful, e.g. in agriculture, forestry and medicine.**

2.2. Sustainable development

The lack of respect for local or indigenous knowledge and the assumption by many Western scientists about the superiority of Western epistemology and scientific discourse is a serious obstacle to sustainable development in light of their apparent failure to meet human development needs and, at the same time, to protect nature and the eco-system. In some scientific circles in the West there is, however, a growing realization that the South may have something to teach the West, and that indigenous knowledge may increase our scientific understanding of natural phenomena which might be crucial for sustainable development. As Sillitoe claims: **“It is increasingly recognized that development initiatives that pay attention to local perceptions and ways are more likely to be relevant to people’s needs and to generate sustainable interventions”** (Sillitoe, 1998, p. 224). The terms ‘development’ and ‘sustainable development’ need therefore also to be addressed from an indigenous perspective, thereby including other epistemological and cultural perspectives of what sustainable development implies. The assumption is that perspectives from different knowledge systems produce a more comprehensive understanding of sustainable development interventions. The implication of such an assumption is not, however, that indigenous knowledge systems are completely isolated from Western knowledge; “people will incorporate and reinterpret aspects of Western knowledge and practice into their traditions as part of the ongoing process of globalization” (Sillitoe, 1998, p. 230). Moreover, any inclusion of indigenous knowledge does not imply its overall relevance and adequacy in addressing developmental issues. While indigenous knowledge often has important advice, knowledge and information to offer, there are also examples from Africa where indigenous knowledge has been a barrier to sustainable interventions.

Sustainable development is an evolving concept which has scientific as well as moral connotations, and is indeed also very contentious. While certain environmentalists criticise the very idea of sustainable development because the term ‘development’ seems to imply economic growth, others assume that sustainable development can only be achieved if growth is given a new content. Other writers again think that capitalism and sustainability are compatible since capitalism is the only surviving economic system and thus inevitable, and the question is rather how to change capitalism from within. Be that as it may, the global debate on sustainable development has only to a limited degree included our concern in this article, issues on indigenous knowledge. The World Commission on Environment and Development (WCED-The Brundtland report, 1987) proposed long-term environmental strategies for achieving sustainable development by the

year 2000 and beyond without paying particular attention to indigenous knowledge. At the UN Conference on Environment and Development in Rio ‘sustainable development’ was defined as development that meets the needs of present generations without compromising the ability of future generations to meet their needs. Since the above definition may be elusive and somewhat unclear, Goldin and Winters propose to narrow the definition to “an economy in which future growth is not compromised by that of the present” (Goldin and Winters, 1996, p. 1). Their definition is also problematic, however, in the sense that the issue of limits to growth, poverty, environmental issues and alternative knowledge systems are not really accounted for. While the intimate connections between poverty and the environment have become central to any discussion of sustainable development during the last two decades (see, e.g. Middleton and O’Keefe, 2003), the hegemonic discourse has to a large extent failed to probe into the potentials of alternative knowledge systems.

While sustainable development is usually linked to environmental issues, the importance of education in sustainable development is also vital. The question is, however, what kind of education for sustainable development? When Chilisa et al. state that it is through education that “we learn about our cultural heritage and our values, and it is the means by which we transmit all forms of knowledge through generations” (Chilesa et al., 2003, p. 4), they have an education process in mind which is deeply rooted in the epistemological reality of the local people. It is in this context that the African Renaissance is important as it seeks, according to Odora Hoppers, to build “a deeper understanding of Africa, its languages and its methods of development” (Odora Hoppers, 2002, p. 2).

3. The Johannesburg Declaration and the UN Decade of Education for Sustainable Development

As has been noted above the importance of indigenous knowledge in sustainable development has not been privileged in the global debate on sustainable development. This is confirmed in the section below where the documents from the World Summit in Johannesburg in 2002 as well as from the United Nations Decade of Education for Sustainable Development are discussed with a special focus on any potential links between sustainable development and education and different knowledge systems.

3.1. The World Summit on Sustainable Development

The **World Summit on Sustainable Development**, held at the end of August 2002 in Johannesburg, issued the *Johannesburg Declaration on Sustainable Development* (UN, JSD, 2002), which once more reaffirmed the importance of eradicating poverty and achieving a fair and just allocation of resources: “The deep fault line that divides human society between the rich and the poor and the ever-increasing gap between the developed and the developing worlds pose a major threat to global prosperity, security and stability” (Declaration, # 12). The Declaration urges “to speedily increase access to basic requirements as clean water, sanitation, adequate shelter, energy, health care, food security and the protection of biodiversity” (# 18). Education and training are not mentioned as basic requirements, but referred to later in # 18 together with “technology transfer and human resource development as tools “to banish underdevelopment forever.” Threats to sustainable development are listed, among which are “chronic hunger; malnutrition; foreign occupation; armed conflict; illicit drug problems; organized crime; corruption; natural disasters; illicit arms trafficking; trafficking in persons; terrorism; intolerance and incitement to racial, ethnic, religious and other hatreds;

xenophobia; and endemic, communicable and chronic diseases, in particular HIV/AIDS, malaria and tuberculosis" (#19).

It is noteworthy that one of our concerns in this article, indigenous knowledge systems and cultural practices, are not included in the list, and that lack of educational and training opportunities is only referred to in #18, and not mentioned as a threat to sustainability, albeit in relation to underdevelopment. These important omissions notwithstanding, it is clear that the notion of sustainable development far exceeds a mere economic perspective referred to above.

The Johannesburg Summit underlines, beside the issue of poverty reduction, the importance of the environment in sustainable development. It is in this perspective indigenous knowledge systems must be seen. Odora Hoppers is right when she claims that "a major threat to the sustainability of natural resources is the erosion of people's knowledge, and the basic reason for this erosion is the low value attached to it" (Odora Hoppers, 2002, p. 7). While modernity and modern knowledge systems can be seen as the ideological foundation of the West and capitalism's aggressive exploitation of nature, the holistic nature of indigenous knowledge systems (the interrelationship of nature, human beings and the supernatural) has major contributions to make to the critical debate on ecology and the preservation of natural resources. The neglect of such knowledge, not the least in the school systems in the South, is a major threat to sustainable development.

While education was not given a prominent place in the Declaration from Johannesburg, the other document from Johannesburg, the Development Plan of Implementation (UN, Development Plan, 2002) refers to education in a number of paragraphs (paragraphs 116–124). The Plan underlines that

Education is critical for promoting sustainable development. It is therefore essential to mobilize necessary resources, including financial resources at all levels. . . to complement the efforts by national governments (#116).

The Plan also refers to the "Millennium development goal of achieving universal primary education," whereby 2015, "children everywhere, boys and girls alike, will be able to complete a full course of primary schooling" (#116). Moreover, the Plan underlines the importance of "sustaining their (the countries') educational infrastructures and programmes, including those related to environment and public health education" (#117). Both the impact of AIDS on the education system (#118) and the importance of Education for All (Dakar) in achieving sustainable development (#119) are referred to. The importance of gender equity as stressed by Dakar is also underlined, and the Plan foresees the creation of a gender-sensitive educational system (#120). Additionally, the Plan suggests to "integrate sustainable development into education systems at all levels of education in order to promote education as a key agent for change" (#121) and also emphasizes the importance of lifelong learning in the promotion of sustainable development (#123).

Even though all these educational goals may be seen as commendable per se, they are marked by a technical educational discourse, which does not ask the important questions about the relationship between education and sustainable development. Does any kind of educational input promote sustainable development?

3.2. UN Decade of Education for Sustainable Development

The assumption would be that the launching of the United Nations Decade of Education for Sustainable Development (2005–

2014, DESD) would explore the relationship between education and sustainable development comprehensively and critically. The objectives of the DESD are to

Integrate the principles, values, and practices of sustainable development into all aspects of education and learning. This educational effort will encourage changes in behaviour that will create a more sustainable future in terms of environmental integrity, economic viability, and a just society for present and future generations (UNESCO, 2008).

What these objectives in reality mean is outlined in UNESCO's *Media as Partners in Education for Sustainable Development* (2008), a manual written to give media reliable information about education for sustainable development. The manual asks whether modern societies can be both economically and environmentally friendly, referring to writers who state that 'sustainable development' is a contradiction in terms and that the phrase is "simply an attempt by business to show that capitalism is environmentally friendly" (UNESCO Media, 2008, p. 36). The report also refers to other commentators who think that sustainability and capitalism are compatible. Referring to Porritt who states that "capitalism is basically the only economic game in town, "the manual focuses on a pricing system which includes the costs in replacing the resources, and the cost of the damage that use of the resource may do. In short, current market economics "will not do. We need new systems of measurement and new definitions of wealth" (UNESCO Media, 2008, p. 36). While this may seem to be a radical departure from market liberalism, the report is basically concerned with keeping the capitalist system alive with an environmental face.

Underlining the importance of education, the manual states: "education. . . can shape the world tomorrow, equipping individuals and societies with the skills, perspectives, knowledge and values to live and work in a sustainable manner" (UNESCO Media, 2008, p. 36). Therefore, reorienting the goals of education "to recognize the importance of sustainable development must become a world priority" (UNESCO Media, 2008, p. 35), meaning that education should function as a critical complement to social, cultural and economic policies. The manual never addresses, however, the need to go beyond Western-based knowledge systems or educational discourses for a more sustainable earth. Since the present global economic system with its underlying knowledge base is only critiqued up to a point, the exclusion of indigenous knowledge in the training manual (IK is not mentioned once) is logical, albeit alarming. It only underlines the hegemonic role of the present, Western, modernist notion of education even though its basic principles and ideological foundation are problematic in terms ecological sustainability and cultural and epistemological sensitivity. One can only hope that the remaining years of DESD will widen the understanding and scope of education in such a way that it starts exploring critically how other knowledge systems can address the issue of sustainability in a more holistic way.

4. A case study: Curriculum 2005 (C 2005), Indigenous Knowledge and Sustainable Development in South Africa

In this section the new curriculum for South African schools, implemented after the ANC came into power, will be discussed, exploring in particular the epistemological foundation of the curriculum and its relationship to indigenous culture and knowledge systems as well as to sustainable development. The question is to what extent recognition of indigenous knowledge coupled with sustainable development has been taken into consideration in

the new South African curriculum (C 2005). Moreover, if indigenous cultures and knowledge systems are ignored, in what way does this absence impact on pupils' learning and, on a more macro level, on the power relationships in South Africa? In other words, is not the inclusion of indigenous (home) knowledge, a necessary prerequisite in South Africa's struggle for sustainable development?

4.1. A modernist curriculum

While the focus here is on South Africa, it could be suggested that some of the consequences discussed are relevant to other parts of Africa, and indeed in other parts of the South.

The South African education policy, in pursuing the vision of a 'post-apartheid' South Africa as set out in its constitution, states the objectives of the new curriculum in the following way:

A prosperous, truly united, democratic and internationally competitive country with literate, creative and critical citizens leading productive, self-fulfilling lives in a country free of violence, discrimination and prejudice (DoE, 1997a, p. 1).

What are the values underpinning such a statement? Which knowledge systems are to be applied? (Breidlid, 2003) On whose premises is such a new South Africa going to emerge? Does it advise ways to sustainable development? The curriculum's proposition that, "The curriculum be restructured to reflect the values and principles of our new democratic society" (DoE, 1997a, p. 1) is – probably intentionally – so vague and ambiguous that one wonders what is included and excluded from the variety of values, world-views and knowledge systems in South Africa.

On closer analysis, however, it is clear neither indigenous knowledge systems nor sustainable development figure prominently in the curriculum. Even though indigenous knowledge systems are referred to in the revised version (2002), C 2005 is modelled on a Western discourse, depending heavily on different international contexts, especially from New Zealand and Australia (DoE, 1995), suggestive of what the African scholar Chinweizu describes as "Europhiliac Africans" (Chivaura, 2006, p. 214). The concept of sustainable development is only mentioned in the revised version under the learning area "Economic and Management Sciences" (DoE, 2002).

According to C 2005, Outcomes Based Education (OBE) will "ensure that learners gain the skills, knowledge and values that will allow them to contribute to their own success as well as to the success of their family, community and the nation as a whole" (DoE, 1997a, p. 10). Concepts like "critical and creative thinking", "organise and manage themselves... responsibly and effectively," "critically evaluate information," "use science and technology effectively," "problem solving contexts do not exist in isolation" (DoE, 1997a, p. 10) are familiar to anyone with some knowledge of curricula from the North. At the same time the special outcomes of the curriculum, in the human and social sciences, specify that it is important "to demonstrate a critical understanding of how South African society has changed and developed" and to participate actively in promoting a just, democratic and equitable society" (DoE, 1997a, p. 56). Other concepts of modernity like progress and development also figure prominently in the policy documents, and are to a certain extent problematised (DoE, 1997a, p. 66).

The stress on universalism, rationality and the compartmentalisation of knowledge (despite integrative efforts) clearly challenges traditional African values where the focus on the locale, the pervasiveness of spirituality and the holistic view of life appear to be at odds with modern values (Breidlid, 2002). The linkage between education, modernity and a "competitive international economy" is

underlined as the prime engine in education policy (DoE, 1997b), advocating a Western development course where sustainability and sustainable development are sidelined. On the other hand, the contribution of traditional cultures in the economic transformation of South Africa is only vaguely referred to: "salvage elements of indigenous culture which are constitutionally aligned and therefore worthy of preservation for prosperity" (DoE, 1997a, p. 193).

The revised curriculum in Natural Sciences touches upon the fact that people move between different worldviews and knowledge systems in a day:

...the existence of different world views is important for the Natural Science Curriculum... Several times a week they cross from the culture of home, over the border into the culture of science, and then back again (DoE, 2002, p. 12).

This epistemological movement is confirmed by for example Fakudze who states that "the African child finds him/herself having to cross the cultural border between his/her African worldview and that of school science as he/she learns scientific concepts presented to him/her in the science classroom" (Fakudze, 2003b, p. 132).

4.2. Crossing epistemological borders

As was exposed by our fieldwork, many teachers, like the pupils, cross cultural and epistemological borders on the same day, teaching Western science at school and taking part in traditional practices at home. How do pupils and even teachers cope with a knowledge system in school, which is alien to their home universe? As one science teacher told us: "I am a science teacher at school, and a traditional practitioner at home" (Breidlid, 2002). The implication here is that the teacher operates with two fairly isolated knowledge systems which do not seem to mutually nurture each other. The sustainability of such a situation is certainly debatable, also in a more national, South African context. Fortunately, the revised curriculum (Natural Sciences) senses a critical challenge here, asking:

...Is it a hindrance to teaching or is it an opportunity for more meaningful learning and a curriculum, which tries to understand both the culture of science and the cultures at home? (DoE, 2002, p. 12).

The cultural border crossings have been identified by Bernstein (1971) as a big problem for working class youths in middle class schools in England. These border crossings, however important and difficult that they may be in the UK, seem of a much more limited, cultural-linguistic character than what can be observed in South African schools. Among Xhosa children it is not only a matter of linguistic code-switching, but of a collision of knowledge systems which is of a far more serious and substantial character than class barriers in school in England. This is not only serious in terms of the actual learning in the classroom, but also in terms of the pupils' future contribution to society. The revised curriculum in Natural Sciences signals that these challenges will be dealt with in curriculum development:

Science curriculum development, which takes account of world-views and indigenous knowledge systems is in its early stages and will be addressed with enthusiasm by many educators. This Revised National Curriculum... is an enabling document rather than a prescriptive one (DoE, 2002, p. 12).

The importance and seriousness of these challenges are underlined by Ogunniyi who states in connection with science

teaching: “The concept of world-view is central to science education because it is the knowledge that a learner brings into the science class. Research has shown that such knowledge has a great potential for hindering or enhancing the learning of science” (Ogunnyi, 2003, p. 27). The crossing of epistemological borders to accommodate the so-called modern, rational world of science means that the pupil, according to Ogunnyi, is “involved in negotiating and navigating a complex array of conflicting mental states. He must synergize these conflicts into a more comprehensive world-view capable of accommodation of the new experience within the framework of intra/intersubjective life worlds, which provide him/her a sense of social identity” (Ogunnyi, 2003, pp. 27–28). The complexities of these negotiations and navigations should not be overlooked. Jegede (1995), for one, claims that the metaphysical, mysterious cultural baggage, which the African child carries to school, is problematic, and if care is not taken “these mysteries, usually tagged as ‘superstitious’, will cause a blockage to any scientific knowledge the learner might acquire as a result of schooling” (Jegede, 1995; Fakudze, 2003a, p. 61).

Research on worldviews held by three groups of students in Form IV classes in some high schools in Swaziland confirms the complex picture described above and shows an intriguing mixture of worldviews embodying magic and mysticism and a more rational outlook. Fakudze concludes her research by stating that the students, “regardless of their gender, age and interest in science, hold varying degrees of traditional as well as scientific notions about selected phenomena, that is, they hold a multiplicity of worldview presuppositions” (Fakudze, 2003a, p. 61). My research confirms such multiplicity of worldviews and knowledge systems, but underlines simultaneously that “there is a sense that despite the intertextuality and dialogic exchange between various value systems, the indigenous cultural values are retained, not only as a means of social cohesion, or as a kind of low-key cultural resistance, but as a fundamental element of Xhosa identity construction” (Breidlid, 2002, p. 43).

It is this mixture of worldviews and knowledge systems that the South African schools have to take into account. So far the revised curriculum is, even though paying lip service to indigenous knowledge systems, firmly grounded in a modern, Western epistemology. Ntuli agrees:

Our education system seems to move farther and farther away from indigenous knowledge. . . There is no attempt at any level to examine the indigenous knowledge systems awareness of the essential interrelatedness of all phenomena—physical, biological, psychological, social and cultural (Ntuli, 2002, pp. 64–65).

While we have seen that some attempts have been made in C 2005 (revised version) to include a discussion of indigenous knowledge systems, Ntuli is right in claiming that the influence of indigenous knowledge systems in education is marginal. When indigenous culture is introduced in school it is often in terms of what Gyekye calls “a truncated and hence impoverished conception” (Gyekye, 1997, p. 107) such as local cultural expressions like dancing and singing. Important as these events may be, they do not really address the underlying epistemological foundation of the indigenous culture and its relation to sustainable development and they become isolated from the general thrust of the curriculum.

4.3. *Indigenous knowledge, education and sustainable development*

This does not mean that the South African government does not take the issue of IKS seriously. In the policy document *Indigenous Knowledge Systems* issued by the South African Department of

Science and Technology (DST) from 2004 the efforts to affirm and develop IKS in South Africa are underlined (DST, 2004, p. 3). While the department’s IKS policy states that it will provide a “a basis upon which indigenous knowledge can be used to make more appropriate interventions” (DST, 2004, p. 3) as well as to affirm African cultural values in the face of globalisation, the policy document still links ideas such as ‘competitiveness and ‘economic growth’ to IKS without problematising these concepts. Stating that the “growth-enhancing effects of IKS remain minimal, supporting the misconception that IKS is static” (DST, 2004, p. 14), the policy document underlines the importance of creating incentive mechanisms to make African IKS more geared towards economic growth. At the same time the document underlines the sustainability of indigenous knowledge in many communities in South Africa without as it were capitalising on the possibility of IKS to strike an alternative course of sustainable development beyond market liberalism. On education the policy document states that the new education system since 1994 is the key to “sustainable technological capacity” and that it is “critical to ensure that the national education strategy is synergistic with and nurturing of IKS” (DST, 2004, p. 17). Although IKS’ crucial role in C 2005 has not materialized, the very existence of a policy document on IKS signals at least a rhetorical commitment on the part of the South African authorities to put indigenous knowledge on the political agenda.

Even though sustainability and sustainable development are not recurring concepts in C 2005 (revised version), clearly education is seen as an important tool in achieving change and sustainable development. The inclusion of “sustainable development” under the learning area “Economic and Management Sciences.” may at first glance be seen as a concession to a mere economic understanding of sustainability, which, however, on further scrutiny is not quite justified. Outcome 2 is entitled “Understanding of Sustainable Growth and Development.” Here the outcome is for the learner to “demonstrate an understanding of sustainable growth, reconstruction and development and reflect critically on related processes” (DoE, 2002, p. 27). In grade 7 the learner is to collect “information on the influence of apartheid economic policies on ownership, poverty, wealth and quality” . . . and identify steps required to redress socio-economic imbalances and poverty (DoE, 2002, p. 38). In grade 9 the learner is to “discuss how the national budget, regional and international agreements can be used to facilitate sustainable growth and development” and “discuss productivity and its effects on economic prosperity, growth and global competition” (DoE, 2002, p. 39). The curriculum insists on a critical approach to economic sustainability:

It takes the view that a ‘balanced’ economy is desirable. Here, a ‘balanced’ economy means one, which aims to achieve sustainable growth, reduce poverty and distribute wealth fairly, while still pursuing the principles of an open market and profitability. It promotes respect for the environment, human rights and responsibilities (DoE, 2002, p. 5).

Given the curriculum’s adherence to a so-called ‘balanced economy’ it is, however, difficult to detect any discrepancy between what was decided in the summit in Johannesburg and what is written in the revised version of C 2005. As has been noted, UNESCO’s work in relation to UN’s Decade for Education for Sustainable Development does not seem to offer guidelines for curricula which to a larger extent need to address the epistemological terrain of the majority of the school children and new and innovative ways to achieve sustainable development.

While the curriculum in South Africa tries to mitigate the worst excesses of an economist’s approach and market liberalism, it is

worth noting how indigenous culture and indigenous knowledge systems are absolutely absent from the discourse on sustainability.

Sustainability is thus more or less exclusively linked to a modernist, Western approach with a dash of poverty reduction strategies. The issue of knowledge systems in connection with sustainability is taken as something given, which is not open to debate. And there is, in practice, only one knowledge system operating, and indigenous knowledge systems do not belong to this discussion.

This is problematic for many reasons. One is the curricular marginalisation of local knowledge systems that operate on a daily basis in many parts of the world. Can these knowledge systems not contribute to sustainable development? Another is the problematic nexus between modernity as understood in the West and sustainable development. The link between modernity, Western development in terms of, e.g. unbridled individualism and ecological devastation referred to above is well documented and should, one would think, trigger some sort of curiosity for alternative knowledge systems where the sacredness of nature may be an important factor in the prevention of environmental destruction (see, e.g. Chilesa et al., 2003). The concept of 'balanced' economy in C 2005 may possibly be perceived by some to be rhetorically progressive, but it does not in practice transcend the borders of the imported, Western knowledge system.

It has already been noted how this foreign knowledge system fails to recognise the indigenous ways of knowing which are dominant in their traditional home situation and thereby creates barriers between the learner and the school. Moreover, if one does not account for indigenous culture and indigenous knowledge systems, one is doomed to fail to communicate with those who are going to be the pillars in transforming the country. As Ntuli states:

For any development to succeed with rural people, and even with many township dwellers in South Africa, the role of divine beings, ancestors, sacred places (like *isivivane*), sacred people and sacred objects needs to be addressed. To touch on these issues is to compel our Westernised intellectuals to experience severe conceptual violence, and yet many of them secretly subscribe to these beliefs (Ntuli, 2002, p. 63).

But it does not imply, as already noted, that "to touch on these issues" is a total acceptance of these knowledge systems as sustainable.

5. Medium of instruction and sustainability

The seriousness of the breakdown of communication in education in South Africa is not only related to the foreign knowledge systems of the various learning areas. The task of bridging the gap between knowledge systems is also related to the issue of language in the classroom. If one agrees that quality education is an important tool in creating sustainable development, the focus must be both on the negotiations between knowledge systems in class, but also on the question of the language in which these negotiations take place. The importance of the mother tongue in teaching is confirmed in many research findings (Pattanyak, 1986; Brock-Utne, 2000; Heugh, 2000). Already in 1968 UNESCO claimed that it is

through his mother tongue that every human being first learns to formulate and express his ideas about himself and about the world in which he lives. Every child is born into a cultural environment; the language is both a part of and an expression of, that environment. Thus, acquiring of this language, his mother tongue is part of the process by which a child absorbs the cultural environment; it can, then, be said that this language

plays an important part in moulding the child's early concepts. He will, therefore, find it difficult to grasp any new concept which is so alien to his cultural environment and that it cannot readily find expressions in his (her) mother tongue (UNESCO, 1968, p. 690).

In the South African primary schools the mother tongue is supposed to be the medium of instruction during the first three years of schooling. In the later grades the provisions in C 2005 and the Language in Education in Policy document (DoE, 1997a,b) are unclear and confusing. C 2005 states that the idea is to keep the home language ("is to be sustained") until "the learner is able to learn effectively in the language of learning and teaching. (Then) the home language should continue alongside the additional language as long as possible" (DoE, 2002, p. 5). Moreover, the revised curriculum underlines that "the curriculum provides strong support for those learners who will use their first additional language as a language of learning and teaching" (DoE, 2002, p. 4). Such a statement signals that the policy acknowledges that some home languages will not be used as languages of learning and teaching after third grade. Our fieldwork in rural and township schools in Eastern and Western Cape confirms such an impression, the situation being that even in homogenous Xhosa-speaking classes the official medium of instruction is English, not Xhosa. Moreover, all textbooks and all exams are in English. This does not mean that teachers use English consistently in their teaching. On the contrary, the teachers make use of code-switching or code-mixing (Brock-Utne and Holmarssdottir, 2003, p. 88) where Xhosa is most often used to explain the content matter in the learning area (in violation of the regulations from the education authorities). Clearly, this is a sensible solution in terms of the pupils' cognitive development, but causes problems when the same pupils sit at the exam table and are forced to answer in English. The efficiency of learning under such conditions is highly questionable. As Rollnick states on the issue of science learning:

Language is a central factor to all learning. Its importance in the learning of science has often been underestimated, as there is a belief that the student's meaning will 'come through' despite language difficulties. The issue of language cannot be ignored as it impinges on the learning of science in important ways related both to attitude and cognition (Rollnick, 1998, p. 21).

In our fieldwork we noted that the language barrier (despite code-switching or code-mixing) created huge problems, even for pupils with a talent for maths or science. As one teacher told us: "I have several Xhosa pupils who excel in maths, but who might fail because the exams are in English".

This means that many pupils, who have successfully navigated between various knowledge systems when taught in their mother tongue, still are classified as failures when the exam results are out due to the language barrier. It would therefore seem that if one subscribes to the idea previously referred to from the World Summit in Johannesburg that education is a very important tool in promoting sustainable development, the South African school system does not seem conducive to such a development. While not enough space and time are set aside to negotiate the various cultures, world-views and knowledge systems in class, the curriculum makes these negotiations and navigations even more difficult because the dominant school languages are alien to the majority of primary school children in South Africa.

6. Conclusion

There is an urgent need to address the issue of indigenous culture, sustainable development and education in Africa. When

the languages and the cultures of the majority of the people are more or less excluded from the curriculum in the country, it does something to the self-confidence and self-esteem of those people, besides the obvious learning challenges it creates in school. What the curriculum should do "... is to help the people and their elite to capitalise and master the existing knowledge, whether indigenous or not, and develop new knowledge in a continual process of uninterrupted creativity, while applying the findings in a systematic and responsible way to improve their quality of life." (Hountondji, 2002, p. 36).

Instead, an exclusion of indigenous knowledge and local cultural practices such as those described above has major implications for the distribution of power in the country where those in the driving seat do not seem to appreciate indigenous cultural capital, at least not in the education system. The democratic problems of such a situation are obvious. The prioritisation of non-indigenous knowledge also means an under-utilization of indigenous resources and knowledge in the development of a given society.

It has been noted earlier in this article that in the case of South Africa the ANC is reluctant to undertake a more radical reorientation in educational policies which includes innovative educational strategies to meet the needs of the majority of South Africans. There seems to be a fear that such new strategies will leave South Africa out of the process of globalisation (see Crossman and Devisch, 2002, p. 107). Moreover, the authorities may worry that a more contextualised curriculum might leave the successful school leavers at a disadvantage internationally even though research has clearly shown that the present educational system under the ANC regime puts the majority of African school children at a disadvantage. There is therefore reason to question the sustainability of the present system. A more comprehensive inclusion of indigenous knowledge may also threaten power relationships based on Western knowledge, and possibly the reproduction of hierarchical structures benefiting those in power. As Sillitoe states: "The privileging of some knowledge over others will extend a degree of power to those who hold that knowledge..." (Sillitoe, 1998, p. 233). Odora Hoppers' work (2002), as a response to the South African Parliamentary Portfolio Committee on Arts, Culture, Language, Science and Technology, signals a curiosity or even willingness by the South African authorities to look into the potential of indigenous knowledge systems. But whether her work and the work of others will influence the next revision of the curriculum remains to be seen. The IKS policy document on indigenous knowledge systems from the Department of Science and Technology (DST, 2005), which attempts to pave the way for the incorporation of IKS into mainstream institutions, confirms the authorities' interest in IKS, even though the document is flawed by its discernable modernist and consumerist slant.

The incorporation of IKS on a larger scale does not, however, only depend on the attitude of the South African government, but even more importantly on the results of further research into the characteristic features of indigenous cultures and knowledge systems. While there is no doubt that this potential has been grossly under-utilised in the past, the potential and contributions of indigenous cultures and knowledge systems in relation to sustainability and sustainable development should not lead to the temptation, as Hountondji reminds us, "to overvalue our heritage", and we should bear in mind that indigenous knowledge "can be said to be less 'systematic' than scientific knowledge" (Hountondji, 2002, p. 25). This is in line with Sillitoe's warning that "we need to guard against any romantic tendency to idealise it. It may be inadequate, especially in situations of rapid change..." (Sillitoe, 1998, p. 227).

Extensive, critical exploration of indigenous cultures and knowledge systems in the future can possibly assess more precisely their viability as a major vehicle of sustainable development and their proper role in the curriculum and in the classroom, not only in South Africa, but in other countries in the South as well. Moreover, the idea of the absolute dichotomy between the two knowledge systems, the one living in harmony with nature and the other dominating it, is highly debatable. While the two systems cannot be completely harmonized or even reconciled, the idea that the two systems might be able to complement each other constructively in achieving a more sustainable future is worth further examination. Given the present state of the world there is an urgent need to address sustainable development issues in new and creative ways. The UN Decade of Education for Sustainable Development signals the important role education is supposed to play globally. According to the UN, education is "one of the most effective forces to bring about the changes in knowledge, values, behaviour and lifestyles required to achieve sustainability and stability within and among countries..." (UNESCO Media, 2008, p. 39). As has been suggested in this article, however, education's role in sustainable development is not unproblematic, since the hegemonic education discourse is more or less exclusively based on Western epistemology. If the global debate on education and sustainable development to a larger extent incorporates alternative, local or indigenous knowledge, there is reason to believe that this more comprehensive understanding of what education is will help opening up new and innovative avenues in the quest for a more sustainable future.

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