

## Emancipatory Indigenous Knowledge Systems: implications for environmental education in South Africa

M.W. Maila and C.P. Loubser

Faculty of Education, University of South Africa, P.O. Box 392, Unisa, 0003 South Africa

\* To whom correspondence should be addressed

Indigenous Knowledge also termed Traditional, Endogenous or Classical knowledge, often fails to contribute to the improvement of the quality of human life. This failure can be attributed purely to the lower status accorded to this type of knowledge in society. This knowledge is accorded low status because it belongs to a particular racial or ethnic group which often, it is assumed, lacks the necessary cultural capital. Despite these negative perceptions of Indigenous Knowledge, there is a growing realisation that this knowledge is part of the global heritage and a national resource to be utilised for the benefit of all humanity. This article presents an argument that there is a major role to be played by Indigenous Knowledge Systems in education in general and environmental education in particular. Environmental education as stated in the Brundtland Commission, the South African Environmental Education Policy Initiative (EEPI), and the NGO Form Principles, is seen as a key process that could enhance Indigenous Knowledge in formal education. The article further argues that the production of Indigenous Knowledge is contextually grounded through social constructivist approaches. However, it has the potential to be contextually and widely used.

### Introduction

Strides are being made towards realising the goal of ensuring the utilisation of Indigenous Knowledge Systems by various academic institutions, individuals and NGOs throughout the world. South Africa is no exception in this regard (South Africa, 1997:76; South Africa, 1998:27-28). There exist profound enthusiasm and deliberate propositions to incorporate and integrate Indigenous Knowledge Systems in education (South Africa, 1996; National Workshop on Indigenous Knowledge Systems, 1998:1; Higgs & Van Niekerk, 2002; Odora-Hoppers, 2002). Environmental education provides a vehicle to incorporate Indigenous Knowledge Systems into the school curriculum (O'Donoghue, Masuku & Janse van Rensburg & Ward, 1999).

Masuku-van Damme (1997:26) notes that in 1987, the World Commission on Environment and Development had already "advised that society at large has a lot to learn from traditional skills and knowledge to manage complex ecological systems". Furthermore, in 1992 the United Nations Conference on the Environment and Development (UNCED) resolved to promote diversity in general and bio-diversity in particular. To achieve this, the Conference committed itself to assisting and encouraging indigenous communities to protect and utilise natural resources. Moreover, it is refreshing to note that the South African government has adopted a broad and holistic policy framework for implementing this international resolution (South Africa, 1997:76). Consequently, indigenous communities and all South Africans are encouraged and called upon to value traditional knowledge and innovations. Furthermore, the National Research Foundation has made Indigenous Knowledge one of its focus areas in collaboration with the Department of Arts, Culture, Science and Technology (South Africa, 1996).

The term 'all South Africans' might seem uncomplicated and straightforward. Unfortunately debates on this issue are vague (Shophe & Mazwai, 1999:X-IX). The Constitution of South Africa (South Africa, 1996:Preamble) declares the "need to create a new order in which all South Africans shall be entitled to a common South African citizenship...". One would, therefore, assume that defining Indigenous Knowledge Systems in South Africa, and elsewhere, would be based on such an embrace vision in the post-colonial era. However, there are differing views on the status of Indigenous Knowledge Systems and these are explained below.

### Different interpretations of Indigenous Knowledge Systems

Indigenous Knowledge Systems are embedded in the cultural milieu of all people, irrespective of race. People are historically and culturally bound and thus have a peculiar knowledge system, which enables them not only to survive, but also to become a civilised community (Ntuli, 1999; Vilakazi, 1999).

According to Ntuli (1999:190), a 'civilisation', which comprises

a peculiar knowledge system, is perceived as the embodiment of all the community struggles, successes and failures that the community was or is currently engaged in, in order to advance itself. It is, perhaps, this dynamic nature of culture which is both a product and a source of creation (Ntuli, 1999:190; Brokensha, Warren & Werner, 1980:3) in a community that creates a myriad of definitions of traditional knowledge processes. Vilakazi (1999:202) attests to the notion of a civilisation as an embodiment of the knowledge systems of a people. He argues that civilisation is:

A complex culture; language or languages; a certain technology; an identifiable pattern in art, music, architecture, poetry, literature and dance; a certain body of knowledge, science, medicine, and values; a certain cuisine, manner of dress and general habits; and so forth, [and that] a civilisation is generally so massive and of such power that it acts like a magnet, drawing outsiders to it, influencing others and being influenced by others.

Aronowitz and Giroux (1985: 80) simplify this issue by equating civilisation with cultural capitals. They indicate that cultural capitals are the different sets of linguistic and cultural competencies that individuals and communities inherit by way of the class located boundaries of their family (community). Citing an example of what they mean, they point out that:

A child inherits from his or family those sets of meaning, qualities of style, modes of thinking, and types of dispositions that are assigned a certain social value and status in accordance with what the dominant class(es) label as the most valued cultural capital.

The inherited Indigenous Knowledge within a cultural setting is therefore essential for that community. But in this article, we argue that not only does that particular community benefit from such knowledge, but other communities, near and far, may also be drawn by the 'magnet' to these cultural capitals, and be influenced whilst influencing them too. This notion of influencing others whilst being influenced, supports the tendency of human beings to socially construct/produce (social constructivism) knowledge as they interact (Aronowitz & Giroux, 1985). Gergen (2001:119) reiterates this notion by indicating that "this is to view knowledge as a byproduct not of individual minds, but of communal relations" (school and community).

Odora-Hoppers (2001:4) defines Indigenous Knowledge Systems as knowledge that is characterised by its "embeddedness in the cultural web and history of a people including their civilisation and forms the backbone of the social, economic, scientific and technological identity of such a people". This definition seems to concur with the view of both Ntuli (1999) and Vilakazi (1999) that the culture of a people, thus its civilisation, carries both its indigenous and modern knowledge systems.

Contrary to this line of thought, Flavier, De Jesus and Navarro (1999:479) interpret Indigenous Knowledge as "basically local know-

ledge that is unique to a given culture. It is the information base for a society which facilitates communication and decision-making". They further argue that "indigenous information systems are dynamic and continually influenced by internal creativity and experimentation, as well as by contact with external systems". They refer to Indigenous Knowledge Systems as science that is user-derived, not scientifically derived, and its use complements and enhances the gains made by modern-day innovations. The introduction of the concepts Information Systems and Modern Science, as opposed to Indigenous Science, seems to be pointing in the direction of regarding Indigenous Knowledge Systems as made up of commodities as well as regarding Indigenous Knowledge as systems that enable the continuous integration of 'information' be they indigenous or modern.

The issue of problem solving in Indigenous Knowledge is also highlighted by Green (1996:51) quoting McClure, who defines Indigenous Knowledge Systems as:

That body of accumulated wisdom that has ... 'evolved from years of experience and trial-and-error problem solving by groups of people working to meet the challenges they face in their local environments, drawing upon the resources they have at hand'.

Chavanduka (1995) and Masuku-van Damme (1997) argue that Indigenous Knowledge Systems are labelled as local and traditional because they are constructed in a local context for resolving local challenges in the environment. However, it is contested whether such Indigenous Knowledge has such a limited function and competence that it cannot be utilised in a broader, national and global manner and whether such knowledge is not a universal resource. These questions are interrogated critically in this article.

Some academics seem convinced that Indigenous Knowledge Systems, or rather, an "ethno-ecological knowledge/traditional story, in whatever shape or form, is fraught with ambiguity, danger and diverse challenges" (O'Donoghue *et al.*, 1999:101). This view on Indigenous Knowledge systems (ethno-ecological/traditional story) cautions us to be careful in consuming traditional knowledge (indigenous) without critically looking at its production or rather construction and utilisation. Examples cited by O'Donoghue *et al.*, 1999 are the assumptions that environmental problems and issues challenging us today are a result of the decline in Indigenous Knowledge Systems utilisation. These authors further argue that "traditional (indigenous) peoples lived in conscious harmony with nature" and that "traditional knowing processes contain some sort of deep purity of values and have somehow been gradually eroded and lost" (O'Donoghue *et al.*, 1999:98). These scholars argue that not everything about the use of Indigenous Knowledge Systems was noble and good (valuable) in those early days. Africa was actually experiencing environmental issues and challenges unique to her setting. This view is concluded with their definition of indigenous knowledge which states that indigenous processes (systems) are seen as any responsive and sustaining symbolic capital, historically grounded and characterising a common-sense life-world knowing amidst local peoples in particular socio-economical settings around the world. What should be noted in this definition, is that though it perceives Indigenous Knowledge Systems as embedded within all cultural groupings, it also elevates the status of Indigenous Knowledge Systems as 'processes' that we respond to and use to sustain ourselves as peoples in different parts of the world.

### 'Un-emancipatory' perceptions about Indigenous Knowledge Systems

The discussion below focuses on restrictive views about Indigenous Knowledge Systems. Key features of the emancipatory perspectives to the integration of Indigenous Knowledge Systems in education are analysed.

- **Indigenous Knowledge Systems are static**  
There has been an assumption amongst academics and the public that Indigenous Knowledge is knowledge which has been almost completely annihilated and therefore, needs to be recaptured, in-

dexed and utilised (O'Donoghue *et al.*, 1999:106). Although not explicitly stated, the White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity (South Africa, 1997:76) and Vilakazi (1999:203) also perceive Indigenous Knowledge as located out there in a particular source, the older, ordinary, uncertificated men and women and traditional healers, especially in rural areas. This perception is based on the commodification of Indigenous knowledge Systems. As a commodity, users know where to look for these indigenous commodities. However, an unrestrictive perspective regards Indigenous Knowledge as an enabling process of cultural capitals that are contextually and historically grounded amongst local peoples, both rural and urban, certificated and uncertificated, for their advancement. It encourages the notion of dynamism which is essential for Indigenous Knowledge Systems education. This view is also useful because it acknowledges the nature of knowledge, namely, that knowledge evolves and that it is socially constructed by people to address environmental needs and challenges.

- **Indigenous Knowledge Systems lack universal usage opportunities**  
The assumption that knowing traditionally (acknowledging and utilising traditional knowledge processes) is a localised occurrence, as elucidated in the abovementioned definitions, might be partly true, because local (as per the broad definition of the above term 'local') people construct and use diverse processes of knowing in order to develop and sustain themselves (Odora-Hoppers, 2001:5; Agenda, 1998:81). However, it is also true that knowledge is generally viewed as a universal heritage and resource. Therefore the implication is that although knowledge is created and utilised locally, it has the potential to be used universally. The argument here concerns Africans acknowledging that their indigenous processes of knowing may not only enhance their development and sustain them as a people, but could also be globally appreciated (Vilakazi, 1999:203). Vilakazi further argues that Africa cannot be excluded from global influences, neither should Africa be guided only by her past because no civilisation (culturally) can manage to develop and prosper in isolation from the 'others.' Le Grange (2000:115), however, cautions us strongly that as Africans, we should resist the homogenising considerations of material and cultural globalisation and internationalisation. The reason is that we need to construct processes of knowledge that enable us to address our own unique problems and challenges first (for example, poverty and unemployment), then concerns and challenges confronting the whole global community (for example, global warming, war and AIDS). In this regard, Indigenous Knowledge Systems can no longer be ignored (Brokensha *et al.*, 1980:4).
- **Indigenous Knowledge is only embodied in the African culture**  
The various views expounded in this article point to the broad perspective of knowledge in the tradition conceived and used in various communities of the world (Flavier *et al.*, 1999; McNeely, 1999; O'Donoghue *et al.*, 1999). Sometimes, some South Africans do not identify with African Indigenous Knowledge Systems. Thus the tendency arises to perceive Indigenous Knowledge Systems as belonging to Africans. This should not be the case in South Africa because it is a country with diverse peoples. This implies that, although Indigenous Knowledge Systems may exist within cultural groups, there is an embracing South African knowledge system that is enriched by the different processes of knowledge embedded within the different cultures. Take the following example of 'eye-contact' language associated with white people, which says "look me straight in the eye and tell me the truth". For most white people the truth is seen in one's eyes. When the person addressed looks one in the eyes, she/he speaks

her/his heart. On the other hand, according to most black people looking a person straight in the eyes, especially if the latter is older, one is disrespectful. One should look down. What can be learned from this example is that for both white and black people the eyes are a mirror of truth. But this truth is demonstrated in different ways. It is therefore, the similarity and difference in meaning of such practices which must be enhanced and used for the benefit of all. By citing this example it is not suggested that all traditional practices should be indiscriminately embraced and used to the detriment of the human race.

- **Indigenous Knowledge Systems incompatible with education**

This view is based on the absolutisation of Indigenous Knowledge Systems of Africa's indigenous people and the perception that western traditions of knowing (which are intolerant to other traditions of knowing) are the best (Ntuli, 1999:188). Coupled with the above notion is the assumption that Africa was a *tabula rasa* before the colonial era (that is a continent with no civilisation) and that western cultural systems of knowledge were regarded as the only means to be used in determining the value of Africa's ideas, beliefs and general way of life (Ntuli, 1999). It is therefore crucial that Africa builds on all the valuable indigenous capitals of the past and relinquishes all that is deskilling or disempowering and disastrous to her development, advancement and sustainability. Rather than developing an ecologically coded African society which excludes the traditions of knowing of other peoples, an inclusive system and process of traditional knowledge should be deliberately and vigorously sought and implemented in the education system of the country.

Such an approach will not only be enriching, but will ensure that mistakes of the past are never repeated in regard to elevating a particular knowledge system above another. A holistic knowledge framework for humanity is critical if we want to respond swiftly and appropriately to an environmental crisis facing us as a people. This view is supported by Odora-Hoppers (2001:17), Vilakazi (1999), Ntuli (1999), Flavier *et al.* (1999), and Brokensha *et al.* (1980).

### Education and Indigenous Knowledge Systems

The assumption that Africa was a 'clean slate' (*tabula rasa*) until Europeans arrived (Ntuli, 1999:188) has been proved to be based on a narrow perception of knowledge as a universal resource. This view is based on the misconception that western cultural knowledge orientations were used to determine the value of blacks' ideas, belief systems and religion (Ntuli, 1999:188). With environmental problems becoming more diverse and complex every day (Maila, 2001:2), the world should utilise and develop other systems of knowledge in order to deal with the challenges at hand. It is imperative that all ways of knowing, whether indigenous or modern; Western or African, must be explored and their valuable capitals (skills, values and wisdom) be integrated into environmental educational frameworks that would take us forward. Knowledge is a national heritage and a national resource.

The discussion below explicates some of the valuable custodians of Indigenous Knowledge Systems. Suggestions are made to steer them forward in their endeavours to embrace Indigenous Knowledge for the benefit of the environment and education.

- **Custodians of Indigenous Knowledge Systems**

#### *The intellectuals*

They need to revisit their educational curricula and align them to the needs of Africa based on the available resources at hand. A progressive and robust approach to the transformation of education to address this crucial issue of the disparity in the utilisation of traditional knowledge systems, is critical to the process of emancipating traditional knowledge in both the African

and international perspective.

#### *The uncertificated rural women and men*

Illiterate people are illiterate only as long as western educational paradigms are the standards of evaluating their 'knowing.' If an African paradigm, though, is used to measure what a so-called illiterate, rural person knows in her/his cultural and historical setting, a so-called intellectual might find himself wanting. According to Ntuli (1999:197), a number of intellectuals and academics consult traditional healers whom it is assumed that they are illiterate according to western standards. If these academics and intellectuals had possessed the traditional knowledge of healing, it would be unnecessary to consult traditional healers.

#### *Urban people*

O'Donoghue *et al.* (1999:101) argues that 'when a story, as an embedded fabric of steering myth, was plucked from the processes of everyday community life, it lost an indigenous, situated voice and was irrevocably transformed'. Since then diverse myths, legends and fables have "become vehicles of wider, more abstracted mystical fantasy, utopian supposition, suppression and struggle". Although this is an assumption that requires critical review because of the dynamic nature of knowledge, it is not only rural, localised people who are the custodians of indigenous knowledge, but the wider community. It can be argued that urbanised people in one way or another, when they engage in their daily lives, use and create 'modernised' traditional knowing systems. Furthermore, O'Donoghue *et al.* (1999:101) concur that Indigenous Knowledge Systems are dynamic and always created to respond to new challenges. They state that we cannot simply restore the voice, or a questionable freedom of old, by somehow returning a story to an oral fire-side or by adding a situated narrative of indigenous 'facts' about a particular socio-ecological context of origin. These are very different processes from those which took place at an indigenous fireside of old — what we have and experience as indigenous myth, story and knowledge today is not something that was ever there in earlier times.

However, this nature of knowing in the traditional way does not diminish the value of the recorded traditional capitals of the past that we have today. Scholars such as Ntuli (1999) and Vilakazi (1999) reiterate that culture (civilisation) is a product and creation of a people (see Un-emancipatory perceptions about traditional knowledge processes). This then enables us to understand that all communities have certain traditional knowing innovations, whether in rural or urban settings. The difference might be in the utilisation of such knowledge based on the process of enculturation.

- **Integrating Indigenous Knowledge Systems in environmental educational programmes**

The integration of Indigenous Knowledge Systems in the environmental education curriculum can either be carefully and appropriately carried out across all learning areas or be offered as an independent learning area. The assumption currently in South Africa is that Indigenous Knowledge Systems are an integral part of the Arts and Culture Learning Area. In this article we argue that such a strategy marginalises Indigenous Knowledge. Gergen (2001:126) argues that knowledge (whether indigenous or western) is spawned within a particular segment of society based on power and class. Aronowitz and Giroux (1985:81) endorse this view when they argue that schools play a particularly important role in legitimising and producing dominant cultural capital through the hierarchically arranged bodies of school knowledge. Certain forms of knowledge (hegemonic western forms particularly) might continue to be given high status in the school curriculum. This might disadvantage learners who have a tenuous knowledge of indigenous cultural capitals.

Just as environmental education processes involve an interdisciplinary, integrated and active approach to learning, as a vital

element of all levels and programmes of education and training (South Africa, 1995:22), so do Indigenous Knowledge Systems. They can be integrated as valuable systems of knowledge clearly stated in education policies.

The implication of this perspective is that Indigenous Knowledge can be integrated in the existing learning areas in the General Education and Training and the Further Education and Training bands of the South African education system as a process of learning based or incorporating indigenous capital content. Because Indigenous Knowledge Systems are embedded in the cultural and historical milieus of different people, careful planning of principles guiding learning is critical. If not, great damage could be caused both to Indigenous Knowledge and the learning process. Therefore, approaches of learning about, in and for traditional knowledge processes in Africa should be based on an African culture in general and a South African culture in particular, biased to a multicultural dimension. This summative view concurs with the White Paper on Education and Training (South Africa, 1995:22) which states that all programmes of education and training should "encourage independent and critical thought, the capacity to question, enquire, reason, weigh evidence and form judgements, achieve understanding, recognise the provisional and incomplete nature of most human knowledge ...".

- **Integration within an African culture**

The pre-colonial education system in Africa was embedded within the rich culture of the people (Vilakazi, 1999:202). It recognised the importance of traditional knowledge systems involving processes that were useful to indigenous people and enabled them to sustain their livelihood. The environmental crisis they experienced was responded to with failure at times, and success at times, as the trial and error methods were seen to be effective (O'Donoghue *et al.*, 1999). Perhaps the endeavours directed at sustainable economic development in Africa depend on the utilisation of all the knowledge systems in order that they may complement the strengths and weaknesses of each other.

Therefore, the urgency with which our education curricula should be transformed to meet the needs of Africa (Ntuli, 1999: 189) and South Africa in particular is of vital importance. Ntuli further claims that "the role of higher education and that of intellectuals generally, in shaping the direction toward a more culture-specific or culturally relevant curriculum, is a critical one". The same sentiments are echoed by Vilakazi (1999:206) when he argues that "Africa needs to formulate and implement policies which would result in initiating an agricultural revolution, to be able to feed her millions of people adequately and lay a basis for industrialisation and modernisation". Traditional knowledge processes remain invaluable in an education system that envisages to integrate all processes of knowing in order to make it relevant to Africa and indeed to South Africa.

- **Continuous monitoring and assessment of implemented education programmes**

Any educational programme implemented in education must be continuously monitored and evaluated to maintain and increase its value, relevancy and quality. Guiding principles to achieve this goal will have to be negotiated by educationists and everyone involved in environmental education. Lotz, Tselane and Wagiet (1998:28), supporting the Education and Training Department's principle on assessment, reiterate the importance of viewing assessment as a continuous process of gathering evidence of learning throughout the school life of a learner in order to be able to ascertain the quality and value of the learning programmes. Thus, traditional knowing processes can be no exception to this rule.

## Conclusion

It is appropriate to conclude by stressing that both traditional know-

ledge processes and scientific knowledge systems are crucial in addressing environmental issues and challenges faced in South Africa, Africa and the world. It has been argued in this article that these processes of knowing can greatly enhance each other. They can complement each other. Odora-Hoppers (2001:14) aptly points out that when these knowledge systems are combined, that is, complement each other they can achieve what neither could alone. We therefore concur with UNCED that "we are all learners and educators" (Some Principles of Environmental Education for Equitable and Sustainable Societies, UNCED 1992). In this regard Flavier *et al.* (1999:482) state that:

Go to the people, Live among the people, Learn from the People, Plan with the People, Work with the People, Start with what the People know, Build on what the People have, Teach by showing, Learn by doing, ... (Credo of Rural Reconstruction).

It is when people acknowledge that they can learn from each other that they begin to emancipate themselves as a people. Traditional knowledge processes can be useful in enabling all humanity, that is, intellectuals, academics and uncertificated people to learn from each other. This view was expounded by the UNCED in 1992 precisely because it was felt that certain processes of knowing were elevated to the detriment of development and well-being of the present and the future generation. Flavier *et al.* (1999) echo the same call. Traditional knowledge cannot be ignored now nor in the coming future. Knowledge is a universal heritage and a universal resource, a useful and potentially enabling resource for our democratised education system.

## References

- Agenda 1998. *Empowering women for gender equity*, 38:81-84.
- Aronowitz S & Giroux HA 1985. *Education under siege: The conservative, liberal and radical debate over schooling*. London: Routledge & Kegan.
- Brundtland Commission 1987. *Our Common Future*. WCED.
- Brokensha D, Warren DM & Werner O (eds) 1980. *Indigenous knowledge systems and development*. Washington, DC: University Press of America.
- Chavunduka M 1995. The missing links. Keynote address to the workshop on the study and promotion of indigenous knowledge systems and sustainable natural resources management in Southern Africa. Midmar, KwaZulu-Natal, 24 April.
- Flavier JM, De Jesus A & Mavarro S 1999. Regional program for the promotion of Indigenous Knowledge in Asia. In: Warren DM, Slikkerveer LJ & Brokensha D (eds). *The cultural dimension of development: Indigenous Knowledge Systems*. London: SRP, Exeter.
- Gergen KJ 2001. *Social construction in context*. London: SAGE.
- Green EC 1996. Indigenous knowledge systems and health promotion in Mozambique. In: Normann H, Snyman I & Cohen M (eds). *Indigenous knowledge and its use*. London: SRP, Exeter.
- Higgs P & Van Niekerk M P 2002. The Programme for Indigenous Knowledge Systems (IKS) and Higher Educational Discourse in South Africa: A critical reflection. *South African Higher Education Journal*, 16:38-49.
- Le Grange L 2000. Is there 'space' for enabling disparate knowledge traditions to work together? Challenges for science (education) in an African context. *South African Journal of Education*, 20:114-117.
- Lotz H, Tselane T & Wagiet R 1998. *Supporting Curriculum 2005*. Pretoria: Government Printer.
- Maila M W 2001. The assessment of learning programmes for the Senior Phase at Environmental Education Centres in Mpumalanga. Unpublished MEd dissertation. Pretoria: University of South Africa.
- Makgoba MW (ed.) 1999. *African Renaissance*. Cape Town: Mafube-Tafelberg.
- Masuku-van Damme L 1997. Indigenous knowledge within environmental education processes. *EnviroInfo*, 26-28.
- McNeely J A 1999. IUCN and Indigenous People: How to promote sustainable development. In: Warren DM, Slikkerveer LJ & Brokensha D (eds). *The cultural dimension of development: Indigenous Knowledge Systems*. London: SRP, Exeter.
- National Workshop on Indigenous Knowledge Systems 1998. Towards the integration of Indigenous Knowledge Systems into the National Innovation System. University of North-West, 21-23 September.
- NGO Forum Treaty 1992. Rio de Janeiro.

- Ntuli P 1999. The missing link between culture and education: are we still chasing gods that are not our own? In: Makgoba MW (ed.). *African Renaissance*. Cape Town: Mafube-Tafelberg.
- O'Donoghue R, Masuku L, Janse van Rensburg E & Ward M 1999. Indigenous knowledge in/as Environmental Education processes. *EEASA Monograph*, No. 3. Howick: Share-Net.
- Odora-Hoppers C 2001. *Indigenous knowledge and the integration of knowledge systems: Towards a conceptual and methodological framework*. Pretoria: HSRC.
- Odora-Hoppers CA (ed.) 2002. *Indigenous Knowledge and the Integration of Knowledge Systems: Towards a Philosophy of Articulation*. Claremont: New Africa Books.
- South Africa 1995. *White Paper on Education and Training*. Pretoria: Government Printer.
- South Africa 1996. *Constitution of the Republic of South Africa, Act 108 of 1996*. Pretoria: Government Printer.
- South Africa 1997. *White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity*. Pretoria: Government Printer.
- South Africa 1998. *White Paper on Environmental Management Policy for South Africa*. Pretoria: Government Printer.
- UNCED 1992. *The Earth Summit*. Rio de Janeiro.
- Vilakari HW 1999. The problem of African Universities. In: Makgoba MW (ed.). *African Renaissance*. Cape Town: Mafube-Tafelberg.
- Warren DM, Slikkerveer L.J. & Brokensha D 1999. *The cultural dimension of development: Indigenous knowledge systems*. London: SRP, Exeter.