Western science and indigenous knowledge: Competing perspectives or complementary frameworks?

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Abstract

Indigenous knowledge systems (IKSs) have gained prominence in recent years as a consequence of varied critiques of the dominance of Western ways of knowing. But are Western epistemologies and indigenous knowledge(s) competing perspectives or complementary frameworks? In this article I respond to this question and discuss some implications of this debate for knowledge production in South African higher education. Offering a response to this question is essential for two reasons: Western epistemologies are spreading rapidly through more subtle forms (to the use of military power during colonialism) such as globalisation processes; counter-narratives to Western dominance are being constructed as a consequence of the internationalisation of indigenous peoples in a contemporary era. I point out that (South) Africa’s future development may depend on embracing some aspects of Western sciences and technologies as well as finding inspiration from more traditional ways of knowing.

INTRODUCTION

Ten years of democracy has witnessed several macro-policies developed by the South African government so as to provide frameworks for charting a process of transforming and reconstructing South African society. Together with policies such as the RDP (Reconstruction and Development Programme) and Gear (Growth, Equity and Reconstruction), a call has been made for an African Renaissance. Concerning the latter Odora Hoppers (2002, 2) writes:

The African Renaissance aims at building a deeper understanding of Africa, its languages and its methods of development. It is a project that includes the rewriting of major tenets of history, both past and contemporary. IKSs thus posit tremendous challenges for the reconstruction and development strategies in South Africa.

Prominence given to Indigenous knowledge in South Africa is evidenced by a number of recently held conferences on the topic, the identification of Indigenous Knowledge Systems (IKS) as one of the research focus areas of the National Research Foundation, and so on. But what is meant by indigenous knowledge? For Semali and Kincheloe (1999, 3) indigenous knowledge ‘reflects the dynamic way in which the residents of an area have come to understand themselves in
relationship to their environment and how they organise that folk knowledge of flora and fauna, cultural beliefs, and history to enhance their lives’. According to Smith (1999, 7) Indigenous knowledge is a term that internationalises the experiences, concerns and struggles of some of the world’s colonised peoples. However, it is important to note that the indigenous project is not a unified one but rather subsumes nuances, contradictions and contestations. As Dei (2000, 113) points out: Indigenous knowledges do not reside in ‘pristine fashion’ outside of the influences of other knowledges. He argues that bodies of knowledges continually influence each other demonstrating the dynamism of all knowledge systems. Rendering a false dichotomy or ‘moral evaluation between good (Indigenous) and bad (conventional/Western) knowledges’ (Dei 2000, 113) is therefore not useful. However, I go along with Dei (2000, 113) that we should nonetheless challenge imperial ideologies and colonial relations of production which continually characterise and shape academic practices. Furthermore, that the exclusion of Indigenous knowledges from the academy leaves unchallenged space for the (re)colonisation of knowledges and cultures in local environments and contexts (Dei 2000, 113).

I argue that if Indigenous Knowledge Systems is to hold any promise of contributing to South Africa’s transformation and reconstruction then education has a pivotal role to play. The transformation challenge for education is a dual one; education must transform for its own sake and is also crucial to the transformation of other spheres of social life (see Pendlebury 1998, 334). The transformation challenge for education has implications for all dimensions of education but I shall focus on two aspects here: curriculum and research. Ginsburg et al. (1992, 42) view ‘curricula as the selection and organisation of knowledge and research as the production of knowledge about reality.’ The curriculum challenge, that is, which topics and perspectives are included and excluded, confronts all levels of the education system. The challenge of including Indigenous knowledge in school (or equivalent institutions) curricula has been taken up in both the Revised Curriculum Statement for General Education and Training (GET) and the National Curriculum Statement for Further Education and Training (FET); both documents mandate that elements of indigenous knowledge should be integrated into all learning areas and subjects (see Department 2002, Department 2003). The curriculum challenge is also pertinent to higher education but it is higher education’s research role (the production of knowledge) that I shall specifically focus on in the article.

In the middle to late 1990s there was much debate in South Africa about an emerging new mode of knowledge production (Mode 2) – much of the debate is captured in a book edited by Kraak (2000a). Gibbons et al. (1994) and Scott (1995) argue that we are witnessing a shift from disciplinary science (Mode 1) to a new mode of knowledge production that is trans-disciplinary, trans-institutional and heterogeneous. Protagonists of the mode 2 thesis argue that this new mode of knowledge production is an outcome of two powerful social forces, namely, globalisation and the democratisation of access to higher education (for more detail...
see Kraak 2000b). Gibbons (2000, 41) elaborates on the latter by pointing out that with the massification of higher education the number of graduates have become too large to be absorbed into the disciplinary structure of academic life. Many graduates are employed elsewhere, in government laboratories, in industry, while others have established their own laboratories, think tanks and consultancies. Higher education institutions are therefore no longer the only role players in knowledge production processes, and what is now emerging is in Gibbon's (2000, 41) terms, 'a socially distributed knowledge system'. The future survival of higher education is therefore dependent on the performance of partnership research with government, industry, and so on. The mode 2 thesis of Gibbons et al. (1994) and Scott (1995) influenced post-apartheid South African higher education policy significantly, in particular the following policy texts: the final report of the National Commission on Higher Education (NCHE), entitled A Framework for Transformation (1996); the Department of Education's Green Paper on Higher Education Transformation (DoE 1996); the Education White Paper 3: A Programme for the Transformation of Higher Education (DoE 1997); and the Higher Education Act of 1997. However, Jansen (2000) points out that even though South African higher education policy documents bear the unmistakable fingerprints of Gibbons and his colleagues its accommodation in South African universities is uneven. For example, whilst Mode 2 knowledge forms thrive and is expanding at an institution such as the University of Pretoria there is little evidence of its success in a historically disadvantaged university such as the University of Durban Westville (as it was formerly known).

My concern about the debates that have transpired on new modes of knowledge production is that they have been framed largely in Western terms. The emerging socially distributed knowledge system that Gibbons (2000) refers to comprises knowledge produced by graduates with research skills that are located in institutions outside of the university. However, these graduates would have received their education and training within Western disciplines and exposed mainly to the influences of Western epistemologies. The potential partnership research between academics situated inside and outside universities therefore remains underpinned by a Western science or scientistic paradigm - the mode of knowledge production has changed but not the ontological and epistemological frameworks underpinning the knowledge production processes. In this article I shall explore possibilities (even though only conceptually) of an expanded notion of a socially distributed knowledge system where Western science(s) and Indigenous knowledge(s) can work together; and to briefly explore how the term Indigenous knowledge can be invoked to engage Western science deconstructively.
Science/knowledge as representation and performance

I propose that Western science and Indigenous knowledges might be viewed either as disparate epistemologies or as complementary frameworks depending on whether one views science/knowledge as representation or science/knowledge as performance. In his seminal work *The Structure of Scientific Revolutions*, Kuhn (1970) identifies two distinct notions of the term paradigm, namely, paradigm as *disciplinary matrix* and paradigm as *exemplar*. The former denotes the ‘entire constellation of beliefs, values, techniques, and so on shared by the members of a given community’ (Kuhn 1970, 175). The latter refers to some sort of element in that constellation, ‘the concrete puzzle-solutions which, employed as models or examples, can replace explicit rules as the basis for the solution of the remaining puzzles of normal science’ (Kuhn 1970, 175). Turnbull (2000, 8) points out that Kuhn’s (1970) first usage of the term paradigm (the main focus of his book) is something analogous to a global theory such a Newtonian physics and is subject to revolutionary change. The second usage (exemplar) on the other hand is closer to the standard meaning of the term – ‘a sample problem solution which can be extrapolated to other problems’ (Turnbull 2000, 8). Exemplars are based on agreements about which kinds of problems are sufficiently similar so that they can treated in the same way. The implication of this is that disparate problems can be perceived as being similar and known techniques and solutions can be applied to it. Turnbull (2000, 8) notes that exemplars are the product of tacit knowledge that is learned by doing science rather than by acquiring rules for doing science.

Table 1 below is illustrative of a representationalist perspective of knowledge where African Indigenous knowledge is viewed as distinctive of Western science. To borrow Kuhn’s words, ‘the entire constellation of beliefs values, techniques, and so on’ shared by members of traditional African and Western communities are perceived as distinctly different. Separating knowledge systems/worldviews conceptually are useful in aiding us to think and learn (i.e., for heuristic purposes). However, there is a danger of our constructions/representations being perceived as mirroring reality to the extent that we try to make reality fit representations of it. For example, I remember as a science student at university when asked to sketch objects that I had observed with the aid of a light microscope; often I (and so did my fellow students) turned to the textbook diagram of the object to measure the accuracy of my work. As a student of science my confidence was not in the work I had performed (what I drew from what I had observed) but in how accurately it resembled the representation(s) of the object(s) as it appeared in a textbook. School and university students learn early on, science as representation to the neglect of science as performance. What students do not learn is the situated messiness of science and for that matter the situated messiness of all knowledge production processes. Furthermore, in representations of Western and African Indigenous knowledges, Western science often is portrayed as superior, universal, and as not having the ‘cultural fingerprints’ that appear to be much more
conspicuous in other knowledge systems (Gough 1998, 508). Also, representations of Western science are used as criteria for declaring ‘other’ knowledges as non-science. A representationalist perspective on knowledge therefore produces an incommensurability perspective, that is, that Western science and Indigenous knowledges are incompatible or that Indigenous ways of knowing may be recognised as a particular way of understanding the world, but that it is not science.

Table 1: Summary of African and Western Systems of Thought

<table>
<thead>
<tr>
<th>African</th>
<th>Western</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthropocentric</td>
<td>Mechanistic</td>
</tr>
<tr>
<td>Monistic-metaphysical</td>
<td>Seeks empirical laws and principles</td>
</tr>
<tr>
<td>Cosmology with religion as an important focus</td>
<td>Public property minus religion</td>
</tr>
<tr>
<td>Orality dominates</td>
<td>Documented</td>
</tr>
<tr>
<td>Sage practice</td>
<td>Truth can be challenged</td>
</tr>
<tr>
<td>Learning is communal</td>
<td>Learning is an individual enterprise</td>
</tr>
</tbody>
</table>

Source: Jegede (1999, 125)

However, understanding knowledge production as performance enables seemingly disparate knowledges to work together so as to produce new knowledge spaces, what Turnbull (1997, 560) terms ‘third spaces’ or ‘interstitial spaces’. It is widely recognised by sociologists of scientific knowledge and philosophers of science that even though knowledge systems may differ in their epistemologies, methodologies, logics, cognitive structures or in their socio-economic contexts, a characteristic that they all share is their localness (see Latour 1988, Rouse 1987, Shapin 1994, Turnbull 1997, Turnbull 2000). Moreover, knowledge is not simply local but located/situated, that is, it has place and creates space. When knowledge is produced it is assembled from heterogeneous components and given coherence through the deployment of social strategies and technical devises. As Star (1989, 388) writes:

> [Knowledge production] is deeply heterogeneous: different viewpoints are constantly being adduced and reconciled . . . Each actor, site, or node of a scientific community has a viewpoint, a partial truth consisting of local beliefs, local practices, local constants, and resources, none of which are fully verifiable across all sites. The aggregation of all viewpoints is the source of the robustness of science.

As mentioned the common element of all knowledge systems are their
localness. However, their differences lie in the way they are assembled ‘through social strategies and technical devices for establishing equivalences and connections between otherwise heterogeneous and incompatible components’ (Turnbull 2000, 13). As Turnbull (1997, 553) writes:

Some traditions move it and assemble it through art, ceremony and ritual; [Western] science does it through forming disciplinary societies, building instruments, standardisation techniques and writing articles. In both cases, it is a process of knowledge assembly through making connections and negotiating equivalences between the heterogeneous components while simultaneously establishing a social order of trust and authority resulting in a knowledge space.

What makes a particular knowledge powerful is not its claim to rationality, objectivity or universality but rather its ability to move from the site and moment of its production to other places and times. Western science is powerful in part because of its ability to deploy a variety of social strategies and technical devices for creating the equivalences and connections between heterogeneous and isolated knowledges. Of course, Western science’s powerful position also has been abetted by the use of military power and imperialism. Creating equivalences and connections between heterogeneous and isolated knowledge is the result of what Turnbull (2000, 19) refers to as ‘social labour’. In other words knowledge is produced through the work of negotiation and judgement that each of the participants in the knowledge production process contributes so as to create order and meaning. Turnbull (2000, 38) argues that when knowledge is assembled through connections and negotiating equivalences a social order of trust and authority is simultaneously established resulting in a knowledge space. In demonstrating how a knowledge space can be created from situatedness Turnbull (2000, 14) uses a premodern example of how the Chartres cathedral were built without architects, plans, structural mechanics or a common measure. He writes: ‘Chartres is a motley, an ad hoc mess, put together with talk, tradition and templates. Through the adoption of variety of such social strategies and technical devices, a knowledge space was created where the work of many men could be assembled’ (Turnbull 2000, 14).

Furthermore, Turnbull (2002, 14) also points out the difficulties of contemporary Western Science research in trying to produce a vaccine for malaria. He notes that despite the irredeemingly messy and local nature of malaria, Western scientists are continuoinly trying for monocultural, global solutions at the expense of local knowledge and local people. In summary, all knowledge systems have localness in common. Moreover, all knowledge is located/situated – all knowledge is motley (messy situatedness). Knowledge is given coherence through the application of social strategies and technical devices (social labour). When connections are created and equivalences established between isolated and heterogeneous knowledges a social order of trust and authority is simultaneously
created which results in a new knowledge space. But, how does the mentioned link to the debate: Western science versus Indigenous knowledge? Firstly, recognising that all knowledges have localness in common decentres Western science and serves a basis for comparing different knowledges equitably. Secondly, because knowledge production in all cultures are assembled from situated messiness (heterogeneous and incompatible parts) an assemblage of heterogeneous components drawn from Western science and Indigenous knowledge is possible and would result in the creation of new knowledges spaces (third spaces or interstitial spaces). Enabling Western knowledge and Indigenous knowledge to work together would depend on how the social order of trust is negotiated between Western researchers and indigenous researchers. At least at a conceptual level, there is a basis for bicultural research in which connections and equivalences are created from seemingly disparate components of Western knowledge and Indigenous knowledge through processes of negotiation and judgment. But, such a conceptual understanding depends on viewing knowledge as performance and not as representation.

Some implications for higher education

(South) Africa’s development is dependent on the use of both Western science and Indigenous knowledge. (South) Africa has to use the good of Western science and also recognise its negative side that has destroyed natural environments and denigrated the cultures of African people. Invoking the term indigenous knowledge can engage Western science deconstructively so as to overcome the binary opposition between Western Science and Indigenous knowledge.

Gratton (2003, 73) argues that the future of African indigenous knowledges lies in the recognition that the post-colonial present is hybridised and that a transcendental synthesis (of traditional and Western) is unworkable (Gratton 2003). However, the hybridised post-colonial presence does not mean the conservation of two competing identities but rather invokes ‘the important ways in which post-structuralists use the language of the dominant structure in order to re-organize it from within’ (Gratton 2003, 73). As Bhabha (1985, 2) writes: ‘A contingent borderline experience opens up in-between colonizer and colonized. This space of cultural and interpretive indecidability produced in the “present” of the colonial moment. The margin of hybridity, where cultural differences “contingently” and conflictually touch resists the binary opposition of racial and cultural groups.’

Recognising the reconstructive/deconstructive force of African indigenous knowledge negates higher education knowledge production processes from being ‘reduced to that which is at worst is an a-historical (universalist) or relativist (local) enterprise’ (Gratton 2003, 65). Gratton (2003, 65), argues that by working on the margins of the dominant colonial and metaphysical discourses, African indigenous knowledge ‘is able to render their (Western Sciences) blind spots and fissures in
order to displace them'. African indigenous knowledge is an expression of the African lived experience but when it is invoked the consequence also is the deconstruction of (Western) science. As Gratton (2003, 65) writes: "African [indigenous knowledge]" is a performative signifier that by its very name brings together and calls into question an endless number of oppositions: past/future, universalist/particularist, African thought/philosophy, etc.'

In higher education programmes post-structuralist theory therefore might be invoked so as to enable the deconstruction of Western sciences. But, in this article I have also discussed higher education's primary role of knowledge production and argued that if the performative side of knowledge/science is emphasised as opposed to the representationalist side of knowledge/science then enabling Western knowledge and Indigenous knowledge to work together becomes possible. For too long what has been taught/learned in (South) African universities has been dominated by Western science disciplines and more importantly by a representationalist perspective of science/knowledge. However, Western science is much more parochial than generally perceived it is not only local but located/situated. Western science like all other knowledges is motley (situated messiness). On the other hand Indigenous knowledges are able to move from their sites and moments of their production and are not as often portrayed, 'closed, pragmatic, utilitarian, value-laden, indexical, context-dependent, and so on' (Turnbull 2000, 40).

The performative side of knowledge production should be emphasised in South African higher education institutions as it enables the working together of disparate knowledges, making authentic bicultural research possible and creating new knowledge spaces. As Africans we can draw inspiration from examples elsewhere, where new knowledge spaces have been created. For example, in Australia Aborigines in Australia's Northern Territory have for many years through their own performative modes mapped their country by identifying every tree and every significant feature of their territory. Today some Aborigines are doing the same using the latest in satellites, remote sensing and Geographical Information Systems (GIS). By representing their local knowledge on digital maps they are able to make their ways of knowing visible in Western terms – 'a new knowledge space which will have transformative effects for all Australians' (Turnbull 1997, 560). In South Africa, San (bushmen) trackers are being equipped with digital devices to record animal sightings, a local example of traditional African ways of knowing, working together with sophisticated Western technologies and in so doing creating a new knowledge space. Partnership (bicultural) research of this kind (between university academics and indigenous communities) would represent an expanded notion of Gibbon's (2000, 41) 'socially distributed knowledge system'.

CONCLUSION

Higher Education is an important social institution where conceptions of reality are
constructed, imparted and have effects in terms of perception and practices. Research in South African higher education has been dominated by Western thinking and as a consequence traditional African ways of knowing have been marginalised. I have pointed out that we can avoid the poisonous paternalism of Western science by invoking the term Indigenous knowledge so as to deconstruct Western science. However, I wish to caution against blind romanticism of indigenous knowledge and as mentioned no knowledge exist in pristine fashion outside of the influence of other knowledges, and no knowledge can escape criticism. A representationalist (what knowledge is) view of knowledge can foster poisonous paternalism on the one hand and blind romanticism on the other. However, if the performative side of knowledge (how knowledge is produced) is emphasised then all knowledges are perceived as local and that disparate knowledges can co-exist without the one displacing the other. Emphasising science/knowledge as performance is a challenge that should be taken up by the contemporary South African universities.

NOTES

1 My use of the term Western knowledge should be understood ‘as always in “scare” quotation marks, that is, as a social construct of Eurocentrism’ (Harding 1993, 20).

REFERENCES


DoE see Department of Education.


Western science and indigenous knowledge


