

Sustainability and Higher Education: From arborescent to rhizomatic thinking

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Abstract

Currently, global society is delicately poised on a civilisational threshold similar to that of the feudal era. This is a time when outmoded institutions, values, and systems of thought and their associated dogmas are ripe for transcendence by more relevant systems of organization and knowledge (Davidson, 2000). The foundations of the modern era (including modern educational institutions) are under sharp scrutiny; the fragmentation of nature, society and self is evidence of the cracks in the foundations. In times of crises old questions often come to the fore. For example, as environmental problems reach unprecedented levels the perennial existential question of how we should live is emerging once more. So too are educational questions such as what and how we should learn. But, times of crises also present new opportunities, create fresh imaginings and alternative meanings, metaphors and languages.

In this paper I wish to appraise sustainability (and its epithets such as development) as a new discourse that emerged in the late 20th century in response to the psychosocio-environmental crises of the time. I shall also examine the (in)capacity of disciplinary knowledge and traditional scholarship to respond to the complex and pressing problems of contemporary society. Finally, I will critically discuss the role that new modes of knowledge production, an expanded view of scholarship and alternative metaphors might play in (re)imagining the university's role in sustainability education.

Keywords: higher education, knowledge, rhizome, scholarship, sustainable development

Introduction

The term sustainability was first used in 18th century German forestry management practices. However, according to the 1986 supplement of the *Oxford English Dictionary*, the use of the word 'sustainability' in English dates from only 1972. The discourse of sustainability was introduced into popular discourse by the Brundtland Commission Report. It defined sustainable development as: 'development which meets the needs of the present without compromising the ability of future generations to meet their own needs' (WCED, 1987). As an adjective, sustainability

has been combined with varied entities such as yields of renewable natural resources, crop yields, agricultural practices, development, ecosystems, communities, societies, living, and even the entire Planet (Wensveen, 2001). In this paper I shall use the terms sustainability and sustainable development interchangeably.

Sustainable development is a contested term. Some criticisms levelled against the term are: it has internal contradictions, it manifests epistemological difficulties, it reinforces a problematic anthropocentric stance, it has great appeal as a political slogan, it is a euphemism for unbridled economic growth and it does not take into consideration the asymmetrical relation between present and future generations (for a more detailed discussion see Bonnett, 1999; Bonnett, 2002; Goodwin, 1999; Le Grange, 2007; Stables & Scott, 2002). Irwin (forthcoming) also notes that sustainability has been taken up in neo-liberal discourses and permeates multi-national corporations, pan-global organisations, national governments, education policy, institutions and curriculum. The contestation around the term and its migration into mainstream neo-liberal discourses does not, however, mean that it should be abandoned as a construct for responding meaningfully to the erosion of what Guattari (2001) terms the three interlocking dimensions of self, society and environment. Sustainability is a term that can be imagined and enacted in alternative ways to the manner in which it is framed in dominant discourses—like all other entities/constructs it is subject to territorialisation, deterritorialisation and reterritorialisation. Put simply, any construct or phenomenon has the potential to become what it is not. As Colebrook (2002, p. xxii) so cogently puts it:

Life creates and furthers itself by forming connections or territories. Light connects with plants to allow photosynthesis. Everything, from bodies, [concepts], to societies, is a form of territorialisation, or the connection of forces to produce distinct wholes. But alongside every territorialization is the power of *deterritorialization*. The light that connects with the plant to allow it to grow also allows for the plant to become other than itself: too much sun will kill the plant, or perhaps transform it into something else (such as sun-dried leaves becoming tobacco or sun-drenched grapes becoming sultanas). The very connective forces that allow it to become what it *is* (territorialize) can allow it to become what it *is not* (deterritorialize).

Environmental educationists have widely differing views on the relationship between sustainability and environmental education. As Sauvè (1996, p. 18) points out, for some, sustainable development is the ultimate goal of environmental education, thus the term *environmental education 'for' sustainable development* (EEFSD). For others, sustainable development encompasses specific objectives that should be added to those of environmental education, thus the expression *education for environment 'and' sustainable development* (EFE & SD). For others still, environmental education inherently includes *education for sustainable development*, thus the use of both terms is tautological.

Moreover, some scholars have troubled the very idea of 'educating for' sustainability arguing that such an approach suggests an instrumentalist view of education.

Some have gone as far as to say that the approach is anti-educational and tantamount to indoctrination. As Jickling (1997, p. 95) writes:

When we talk about ‘education for’ anything we imply that education must strive to be ‘for’ something external to education itself. We may argue, in an open sense, in favour of education for citizenship or character development. However, as prescriptions become more specific, interpretations of education become more loaded and more problematic

I shall not discuss the contested nature of *education for sustainability* in detail because it has been reviewed extensively elsewhere (see, for example, Jickling, 1995, 1997; Jickling and Spork, 1998; Le Grange, 2007). However, I would like to reiterate that the slogan, ‘education for sustainable development’ represents the migration of the term sustainability into global (neoliberal) discourses. As a consequence it has been placed firmly on the agenda of supranational organisations such as the United Nations Organisation, as evidenced by the UNO declaration of the years 2005–2014 as the decade of Education for Sustainable Development (EDS). As a global(ising) discourse, education for sustainable development could have homogenising and normalizing effects. As Irwin (forthcoming, p. 5) writes:

The stabilisation of ‘sustainability’ as this new metaphor for market oriented, Neoliberal ethos of maintaining resources radically alters the spectrum of approaches towards environmentalism. This plays out in educational policy and curriculum. In today’s society, many ‘modern’ nations are shifting ‘environmental education’ (if they had one) towards ‘education for sustainability’.

The narrow view of environmentalism reflected in ‘education for sustainability’ (at least its Neoliberal version) may thwart efforts at healing the interlocking dimensions of self, society and environment, as it is adopted in education policies and practices. ‘Education for sustainability’ holds the danger of becoming education for consumerism and unbridled economic growth. However, I shall show in this paper that sustainable development education (sustainability education)—as I prefer to name it—can also be the carrier of alternative possibilities, if viewed rhizomatically rather than arborescently. An arborescent view holds that sustainability education is centred in global Neoliberal discourses which branches in tree-like fashion to the periphery (local). A rhizomatic view of sustainability education decentres the phenomenon/construct, the upshot being a distributed view of the term that opens up alternative ways of knowing and being which include indigenous ones. In arguing for the latter view of sustainability education the work of Deleuze and Guattari (1987) is most useful. I shall apply my discussion on sustainability to higher education and specifically to the notion of scholarship.

I divide the remainder of the paper into the following sections: sustainability (education) as a rhizome, deterritorialisation of disciplinary knowledge, (re)imagining scholarship, and some parting thoughts.

Sustainability (Education) as a Rhizome

In their book, *A Thousand Plateaus*, Deleuze and Guattari (1987) distinguish between arborescent and rhizomatic thinking. The former refers to conceptions of knowledge as hierarchically articulated branches of a central stem or trunk rooted in firm foundations. The latter refers to chaotically complex networkings of stems interconnecting the shoots of some grasses (see Gough, 2004; Sellers, 2006).

A tree has a single taproot from which a main stem grows, from which branches in turn grow to produce leaves and fruit. The tree is a useful metaphor for understanding how knowledge is understood and constructed within traditional Western thought. It remains the dominant system of thought throughout the world. However, the rhizome metaphor opens alternative ways of thinking about knowledge generally, and more specifically about sustainability education. Deleuze's and Guattari's (1987) thoughts on the rhizome are particularly illuminating and generative. They point out that the rhizome assumes very diverse forms, 'from ramified surface extension in all directions to connection into bulbs and tubers ... The rhizome includes the best and the worst: potato and couchgrass, or the weed'. Sustainable development as a rhizome can therefore be best and worst. It can produce good and bad practices, but should, however, not simply be viewed as a dualism or dichotomy. On the one hand, it can be reduced to political slogans. On the other hand, it can have powerfully transformative effects on learners, teachers, schools, universities, communities and policy-makers because it opens up alternative possibilities to dominant ones. Rhizomatic thinking not only enables students to understand how phenomena/constructs become stabilized or normalized in society but also enables them to ascertain what the 'faults and fissures' (Irwin, forthcoming, p. 3) and the vectors of escape are. Best can become worst and worst has the potential to become best through a process called deterritorialisation.

Deleuze and Guattari (1987, pp. 7–12) identify six characteristics of rhizomes which I suggest could enable us to rethink or re-imagine sustainability education. As mentioned, sustainability has been put firmly on the agenda of supranational organisations such as the United Nations Organisation. The upshot of this is that certain definitions of sustainability have become privileged, producing homogenising and normalizing effects. I shall show that Deleuze and Guattari's principles offer alternative possibilities to globalizing definitions of sustainability education that are framed in Western neo-liberal terms, opening up possibilities for among others the inclusion of indigenous knowledges. The principles are: 1 and 2) Principles of connection and heterogeneity; 3) Principle of multiplicity; 4) Principle of assigning rupture; and 5 and 6) Principles of cartography and decalcomania.

Principles of Connection and Heterogeneity and Sustainability Education

These principles mean that any point of a rhizome can be connected to anything else. Deleuze and Guattari (1987) argue that this is very different from the tree or root, which plots a point, and fixes an order. Understood in this way, sustainability education connects the ideas, tools and skills of all participants involved (community

members, academics and students) in multiple ways as to produce ‘new’ knowledge and ‘new’ knowledge spaces.

Principle of Multiplicity and Sustainability Education

Deleuze and Guattari (1987) argue that arborescent thinking produces pseudo-multiplicities. This is because the variants are branches from a single trunk (theory) and so are essentially not different. For them true multiplicities are rhizomatic. They write: ‘A multiplicity is neither subject nor object, only determinations, magnitudes, and dimensions that cannot increase in number without the multiplicity changing in nature (the laws of combination therefore increase in number as the multiplicity grows)’ (p. 8). Therefore, if sustainability is viewed rhizomatically then it will be characterized by multiplicity. Deleuze and Guattari (1987) remind us that the rhizome has no points or positions, such as those found in a structure, tree, or root—there are only lines. Lines enable proliferation in all directions to form an assemblage. Sustainability education therefore could be understood as an assemblage, meaning that it increases in dimensions of multiplicity, and necessarily changes its nature as it expands its connections. All aspects of sustainability education (such as outcomes, learning activities) would be constantly changing, that is, without fixity. They should, therefore, be understood as moments of interaction between lecturers, students and community members during pedagogical episodes. In this sense sustainability education does not simply involve implementing ideas/models/frameworks defined by supranational organisations or governments but in transforming such ideas/models/frameworks so as to be responsive to multiple local contexts and needs. Put differently, sustainability education has become territorialised into a global discourse, but the global discourse is also deterritorialised resulting in reterritorialisation occurring in local contexts.

Principle of Assigning Rupture and Sustainability Education

Deleuze and Guattari (1987, p. 9) argue that a rhizome might become broken, shattered at a given place, but it will again grow on one of its old lines, or on new lines. They write:

You can never get rid of ants because they form an animal rhizome that can rebound time and again after most of it has been destroyed. Every rhizome contains lines of segmentarity according to which it is stratified, territorialized, organized, signified, attributed, etc., as well as lines of deterritorialization down which it constantly flees. There is a rupture in a rhizome whenever segmentary lines explode into a line of flight, but the line of flight is part of the rhizome. (Deleuze and Guattari, 1987, p. 9)

Deleuze and Guattari (1987, p. 10) use the example of the orchid and the wasp to describe movements of deterritorialisation and processes of reterritorialisation to show how the two species are always connected, that is, caught up in one another. They write:

The orchid deterritorialises by forming an image, a tracing of a wasp; but the wasp reterritorializes on that image. The wasp is nevertheless deterritorialized, becoming a piece in the orchid's reproductive apparatus. But it deterritorializes the orchid by transporting its pollen. Wasp and orchid, as heterogeneous elements, form a rhizome. (Deleuze and Guattari (1987, p. 10)

The processes of territorialisation, deterritorialisation and reterritorialisation can usefully be brought to bear on sustainability education. Globally sustainability (education) has become territorialised/organized as sets of guidelines, principles, frameworks, outcomes, which may constitute lines of segmentarity. The notion of deterritorialisation enables us to register the possibility of these lines of segmentarity rupturing or exploding into lines of flight, shifting the way in which we look at globalisation and global discourses on sustainability education. Globalisation might not be understood as a process that is complete. Neither should the principles/frameworks of sustainability education defined by governments or supranational organizations be seen as having fixity. Instead they should be seen as being in constant movement or transformation. Sustainability education viewed in this way necessarily involves the integration and transformation of the local and the global. As O'Riley (2003, p. 7) cogently argues, a rhizomatic view of knowledge 'affirms what is excluded from Western thought and reintroduces reality as dynamic, heterogeneous, and nondichotomous; [rhizomes] implicate rather than replicate; they propagate, displace, join, circle back, fold'. When sustainability education is viewed rhizomatically, it becomes possible to integrate and transform Western and indigenous knowledge, and thus create new knowledge spaces in which new knowledge on sustainability (education) can be produced. Such knowledge spaces are created when different knowledges leave home (are deterritorialised) and are reterritorialised to produce new knowledge. By new knowledge I mean that existing knowledges change their nature through the rupturing of the 'old' and that the lines of flight of seemingly disparate knowledges (Western and indigenous) connect to form new knowledge assemblages (reterritorialisation). In this way indigenous knowledges about environments become integrated with Western science, resulting in the transformation of both Western and indigenous knowledges.

Principle of Cartography and Decalomania and Sustainability Education

Deleuze and Guattari (1987) view the rhizome as a map and not a tracing. They point out that all tree logic involves tracing and reproduction. They return to the orchid and the wasp and write:

The orchid does not reproduce the tracing of the wasp; it forms a map with the wasp, in a rhizome. What distinguishes the map from the tracing is that it is entirely oriented toward experimentation in contact with the real. The map does not reproduce an unconscious closed in upon itself; it constructs the unconscious (Deleuze & Guattari, 1987, p. 12).

If sustainability (education) is viewed in this way then it is constantly open to new connections and alternative possibilities. As Deleuze and Guattari write: ‘The map is open and connectable in all of its dimensions; it is detachable, reversible, susceptible to constant modification’. Sustainability (education) has multiple entryways, and its transformative potential lies in its orientation toward experimentation with (real) communities in efforts to address pressing problems faced by such communities and global society. Sustainability (education) in this sense does not involve the reproduction of the same in different parts of the globe. Sustainability (education) becomes distributed in global society creating possibilities for new understandings in different places. Smagorinsky *et al.* (2006, p. 87) articulate the cartography principle in the following way:

[The rhizome] represent[s] social systems that expand horizontally, producing multiple shoots that interweave throughout the system and may break off to form whole new systems that create, or *map*, new possibilities for growth.

Put simply, when sustainability education is viewed rhizomatically, then it creates or maps new possibilities for growth—new possibilities for knowing and being.

The key question which I wish to address in this paper is what implications such a rhizomatic view of sustainability (education) has for the way in which knowledge is both perceived and produced in higher education institutions. I shall attempt to address that question by arguing for a transdisciplinary trajectory for sustainability (higher education).

Deterritorialisation of Disciplinary Knowledge

Twenty years ago sustainable development was introduced into popular discourse. Since then there has been debate as to what it means and how it should be implemented. Asidu (2005) argues that after two decades of sustainable development, the concept remains ‘as ambiguous and elusive as ever’ (n.p.). Moreover, environmental problems have reached unprecedented levels and self, society and nature have become eroded further. Guattari argues that capitalism has expanded to a globalised form which he calls Integrated World Capitalism (IWC). For him, the symptoms of increasing domination of IWC is evident in the sufferings of three interlocking elements/domains of self, society and nature—the suffering of the earth is evident in the suffering of self, society and nature. Guattari (2001, p. 27) writes:

The earth is undergoing a period of intense techno-scientific transformations. If no remedy is found, the ecological disequilibrium this has generated will ultimately threaten the continuation of life on the planet’s surface. Alongside these upheavals, human modes of life, both individual and collective, are progressively deteriorating. Kingship networks tend to be reduced to the bare minimum; domestic life is being poisoned by gangrene of mass-media consumption; family and married life are frequently ‘ossified’ by a sort of standardization of behaviour; neighbourhood

relations are generally reduced to their meanest expression ... It is the relationship between subjectivity and its exteriority—be it social, animal, vegetable or Cosmic—that is compromised in this way, in a sort of general movement of implosion and regressive infantilization.

Although Asidu (2005) acknowledges the complexity that has not yet made it possible to define sustainable development clearly, he unfortunately succumbs ‘to universalising ambitions by regarding contestation, ambiguity and multiplicity as problems to be solved ... rather than as qualities that signal marvellous potentials for an on-going, open-ended fabrication of the world’ (Gough, 2006, p. 116). The quest for authoritative, stable and settled definitions of sustainable development needs be troubled particularly when such definitions are produced by powerful supranational organisations as they promise to produce similar homogenizing and normalising effects to those produced by IWC, that is, further erode the three interlocking domains of self, society and nature. Healing of self, society and nature requires us to think imaginatively and creatively about socio-environmental problems and a rhizomatic view of sustainability (education) embraces such thinking. A rhizomatic view of sustainability (education) also enables better capturing of the complexity of socio-environmental problems. If higher education is to contribute to such thinking then it not only has to invigorate the lines of escape from Neoliberal discourses but also has to overcome the strictures of disciplinary knowledge.

I use disciplinary knowledge here in its dual sense. M. J. Smith (2005) elaborates on this duality when he writes:

First, the empirical description of the bodies, texts and matter which constitute a specific field of knowledge production and acting as interpretive repertoires through which extra-discursive performances of enunciation and utterance are made concrete. Second, the mechanisms through which academic discourses regulate the production of meaning, of what can and cannot be thought and said, so that the sedimentary character of the assemblage remains stable or even undisturbed. (p. 160)

What follows from the latter sense of disciplinarity is that if traditional academic disciplines were used as vehicles for sustainability education then the sustainability education could produce homogenizing and normalizing effects. In that case, sustainability education would be shaped by the regulatory apparatus of the particular discipline or disciplines. However, recently we have witnessed shifts in the assemblages of scientific knowledge which might be best articulated in terms of the Deleuzo-Guattarian contrast of *arborescent* and *rhizomatic systems*. Deleuze and Guattari (1987) again provide us with useful conceptual vocabulary for understanding the shift from disciplinary knowledge to the emergence of transdisciplinary knowledge, the latter cogently captured in the works of Michael Gibbons and his colleagues. M. J. Smith (2005) notes that the assemblage of disciplinary knowledge may be understood as movements that constitute them as territories and fields of interiority, but also having points of deterritorialisation and lines of flight along

which the assemblages of disciplinary knowledge are fragmenting and losing coherence giving rise to transdisciplinary knowledge networks.

Gibbons *et al.* (1994) and Scott (1995) argue that we are witnessing a shift from Mode 1 (pure, disciplinary, homogeneous, expert-led, supply-driven, hierarchical, peer-reviewed, and almost exclusively university-based) to a new Mode 2 (applied, problem-centred, transdisciplinary, heterogeneous, hybrid, demand-driven, entrepreneurial, network-embedded and so on) knowledge production. 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, 2000). Gibbons (2000) 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 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 Gibbons' (2000, p. 41) term, 'a socially distributed knowledge system'. The future survival of higher education is therefore dependent on research done in partnership with government, industry, and other role players. Nevertheless, I would argue that Gibbons' notion of a 'socially distributed knowledge system' might be expanded to include ordinary citizens (including indigenous communities), who are in the best position to know and understand the complexity of socio-environmental problems that they face daily. These partnerships between universities and local communities would make it possible for sustainability education to include citizenship education—the fragmentation of disciplinary knowledge thus provides space for the inclusion of indigenous knowledge. In the next section of the paper, I explore the implications that all of this has for the way in which scholarship might be understood.

(Re)imagining Scholarship

Rhizomatic sustainability education requires (re)imagining of scholarship. Some work on an expanded view of scholarship has been done, and there has been useful debate on this over the last two decades. In his seminal work Boyer (1990) identifies four separate but overlapping functions of scholarship: scholarship as *discovery*, *integration*, *application*, and *teaching*. *Scholarship as discovery* is the most familiar model of scholarship that involves research done within disciplines, the so-called 'blue-sky' research which involves a commitment to knowledge for its own sake. However, the scholarship of discovery does more than just contribute to the body of knowledge in the discipline: it also includes contributions that academics make to the climate of the higher education institution (the university). The passion of the academic and the product of research (such as a publication) give meaning to this form of scholarship. The excitement with which the academic does original research provides a model of the way in which students should conduct their work. *Scholarship as integration* involves bringing new insight(s) to bear on original research. It involves making connections across disciplines so that specialised

knowledge is placed in a larger context or as Boyer (1990) puts it: ‘fitting one’s own research—or the research of others—into larger intellectual patterns’ (p. 19). This may involve members of different faculties working in collaboration to describe/define a reflexive practitioner, for example. Boyer’s notion of scholarship as integration might also be associated with Gibbons’ (2000) notion of Mode 2 knowledge that I discussed earlier. *Scholarship as application* concerns itself with how knowledge can be applied to problems that could benefit individuals, communities or institutions. It is associated with services that academics provide to communities. This could involve various activities such as professors serving on boards of environmental and wildlife organisations, on national curriculum task teams, as consultants to national and provincial education and environment/tourism departments, and working in collaboration with communities on community-based projects. These activities involve commitment, rigorous planning and execution, and responsibility—some of the hallmarks of scholarship. *Scholarship as teaching* involves teachers not only possessing content knowledge but pedagogical knowledge as well. Furthermore, it implies that teachers become active learners through critical reflection in/on their practices.

The four functions of scholarship that Boyer describes invite a reconsideration of the nature of scholarship. Furthermore, it encourages lines of escape from traditional perceptions and practices of scholarship. It also challenges university reward systems that frame scholarship parochially, influenced by a rising culture of performativity that has penetrated the consciousnesses and activities of those who have vested interests in the university. Put differently, Boyer’s functions of scholarship register the possibility of imagining and practising scholarship more generously and by so doing giving due acknowledgement to important work performed by academics—work that is generally rewarded poorly. My particular focus here, however, is with the *scholarship of integration*. Although I specifically focus on the *scholarship of integration* in this article, I am aware that the different functions of scholarship inevitably overlap with one another.

I wish to argue that Boyer’s *scholarship of integration* needs to be reconsidered and expanded to a notion that integrates his *functions of scholarship* with different *forms of scholarship*. The distinction between *functions of scholarship* and *forms of scholarship* is necessary because the former could be mistakenly understood to mean the latter. When Boyer articulated his expanded view of scholarship he referred to different functions of scholarships not to different forms or types of scholarship. In other words, Boyer argued that all scholars should engage in activities involved in constructing new ideas/theories (scholarship of discovery), applying insights to real life problems (scholarship of application), integrating knowledge (scholarship of integration) and sharing insights with students or co-produce knowledge with students (scholarship of teaching). However, there are also scholarship forms or types that are closely aligned with the core functions of the university: research, service (community interaction) and teaching, that is, *research scholarship*, *teaching scholarship* and *service scholarship*. There is one difficulty in the distinction made between forms of scholarship and functions of scholarship because teaching is categorised as both a function and form of scholarship. To overcome this difficulty,

Table 1: The Integration of Forms and Functions of Scholarship

		<i>The FUNCTIONS of Scholarship</i>			
<i>UniScope</i>		<i>DISCOVERY of Knowledge</i>	<i>INTEGRATION of Knowledge</i>	<i>APPLICATION Of Knowledge</i>	<i>EDUCATION Sharing of Knowledge</i>
The FORMS of Scholarship	TEACHING Scholarship	Discovery Teaching	Integration Teaching	Application Teaching	Education Teaching
	RESEARCH Scholarship	Discovery Research	Integration Research	Application Research	Education Research
	SERVICE Scholarship	Discovery Service	Integration Service	Application Service	Education Service

Source: Adapted from Hyman *et al.* (2001, p. 15).

I take the view of Hyman *et al.* (2001) who substitute education for teaching as a function of scholarship. The *scholarship of integration* which I argue for and also challenge is best illustrated by the multi-dimensional model of scholarship that is represented in Table 1 below. This model was developed by Hyman *et al.* (2001) and referred to as the UniScope multi-dimensional model of scholarship.

Hyman *et al.* (2001, p. 15) provide us with a good heuristic but perhaps too neat a representation of the integration of functions of scholarship with forms of scholarship. I would suggest a more rhizomatic view of *scholarship as integration* with multiple possibilities of connecting forms of scholarship with functions of scholarship so that it involves more than just integration (bringing together isolated parts to form a whole) but the ongoing transformation of scholarship, in an effort to better understand and to take action in view of pressing socio-environmental problems facing contemporary society. I am suggesting that a scholarship of integration should not be limited to the possibilities that the table allows for integration—producing what Deleuze and Guattari (1987) refer to as pseudo-multiplicities. Rather I am arguing for the deterritorialisation of forms and types of scholarship so as to create growth in new directions to form new assemblages of scholarship.

Some Parting Thoughts

A rhizomatic view of sustainable development enables creative and imaginative thinking about socio-environmental problems. It dispenses of the ambition to clarify the meaning of sustainability (education) to the extent that it becomes a settled issue. It also produces vectors of escape from potential homogenising and normalizing effects of notions of sustainability (education) as defined at inter-governmental conventions and by supranational organisations, and by so doing challenges deterministic notions that ‘there is some kind of teleological movement, that increasingly defines every aspect of humanity and nature as part of the market rubric’ (Irwin, forthcoming, p. 2).

However, such an alternative view of sustainability (education) cannot be enacted through disciplinary thinking/knowledge, which itself is tree-like. The deterritorialisation of disciplinary knowledge which is currently occurring as evidenced by the emergence of what Gibbons (2000) has termed Mode 2 knowledge provides useful beginnings for imagining and enacting sustainability (higher education) through transdisciplinary networks that are in the process of continual transformation. Gibbons' (2000) socially distributed knowledge system, however, only includes collaborative work of graduates now working in locations outside the university. I have suggested that Gibbons' socially distributed knowledge system might be expanded whereby the shoots of the rhizome grow to connect with ordinary citizens including indigenous peoples. The emergence of ethnobotany is an instance where the deterritorialisation of a traditional Western discipline (botany) and the deterritorialisation of the knowledge of indigenous communities have resulted in their reterritorialisation and the emergence of a new knowledge area. As L. Smith (2005, p. 93) points out, indigenous knowledge which was once denied by Western science as irrational and dogmatic now is one of the frontiers of knowledge. Ethnobotany involves moving beyond traditional scientific inquiry, deploying qualitative research methods such as interviewing community experts, observing practices, and developing word banks and other resources (L. Smith, 2005, p. 94).

Moreover, sustainability higher education requires a reconsideration of scholarship, requiring a scholarship that not only integrates but also transforms forms and functions of scholarship. Sustainability higher education as rhizome makes possible the redistribution of authority by sharing intellectual capital and is inclusive with respect to the participation of citizens (indigenous communities) in knowledge production in relation to the interwoven dimensions of self, society and environment. But, this requires the parallel transformation and redistribution of scholarship and (disciplinary knowledge)—scholarship must become rhizomatic.

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