



Sustainability Assessment Using a Unit-based Sustainability Assessment Tool: The case of three teaching departments at Rhodes University, South Africa¹

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Abstract

A sustainability assessment study was performed with three teaching departments at Rhodes University – Ichthyology and Fisheries Science, Anthropology, and Accounting. The assessment used a Unit-based Sustainability Assessment Tool (USAT) and was guided by systems thinking and the ontological framework provided by critical realism. Results of the study showed that the Department of Ichthyology and Fisheries Science had a higher integration of sustainability issues in its activities than the other departments sampled, with Accounting having the lowest integration. Interviews conducted with departmental heads and content analyses of documents revealed differences in sustainability issues addressed and in approaches used in tackling them among these departments. The study is intended to inform the Mainstreaming of Environment and Sustainability in African (MESA) Universities Partnership, which promotes mainstreaming environment and sustainability in universities during the United Nations Decade of Education for Sustainable Development. The study does not provide answers to mainstreaming activities, but opens up space to debate and deliberate how to deal with the mainstreaming of sustainability in universities. It identified some of the challenges to be addressed in university-wide mainstreaming work, and affirmed the need for systems thinking in bringing about change at institutional level to extend changes taking place in individual teaching contexts.

Introduction

The concept of sustainable development emerged in the early 1980s due to a realisation of the need to balance economic growth and social progress with environmental concerns (Banerjee, 2003). It became prominent in the late 1980s through the work of the 1987 Brundtland Commission, which led to the defining of sustainable development by the World Commission on Environment and Development (WCED) (1987:43) as ‘development that meets the needs of the present without compromising future generations to meet their own needs’. The WCED (1987) explained that sustainable development requires balancing economic growth with environmental protection and social well-being without stopping development altogether. The concept has, however, been subject to varied interpretations, hence the controversy regarding its meaning and what it entails (Banerjee, 2003; Pittel, 2002; Jickling 2005; Haque, 2000). Economists, for example, emphasise protection of environment to sustain economic development, while environmentalists stress non-depletion of resources (Carter, 2001).

The theory of resilience is increasingly being used in sustainable development discourse. Holling (1973:14) defines resilience as 'a measure of the persistence of systems and of their ability to absorb change and disturbance and still maintain the same relationships between populations or state variables'. The more resilient a system, the larger the disturbance it can absorb without shifting into an alternate regime. Without resilience, ecosystems become vulnerable to disturbances that could previously be absorbed (Walker *et al.*, 2006). Folke *et al.* (2002) maintain that the goal of sustainable development is to create and sustain prosperous social, economic and ecological systems. These systems are, however, inextricably linked as humanity depends on ecosystems services for its wealth and security. People rely on ecosystems for services like clean water and air, food production, fuel, and so forth. At the same time, humans can positively or negatively transform ecosystems into more or less desirable conditions respectively. Destruction of ecosystems by humanity can have serious implications on human livelihoods. Human and ecological systems are therefore dynamic, interacting and interdependent (Folke *et al.*, 2002). Resilience provides an important concept in appreciating and dealing with such complex relationships so as to promote sustainability of the systems. They introduce the concept of diversity as being valuable in complex adaptive systems and in resilience building (Folke, 2006), a concept which has some relevance when considering the diverse responses of university departments to sustainable development, as indicated in the analysis below.

Universities, through their mission of teaching, research and community service, serve as centres for the creation, transmission, critique and dissemination of knowledge (Tünnermann Bernheim & de Souza Chaui, 2003). They play a special role in seeking solutions to societal problems and should be concerned not only with economic growth, but other social, cultural, and political issues as well (Badat, 2007). Among the major challenges of society today, in which universities are expected to play a key role, is sustainable development.

The centrality of the role of education in sustainable development was emphasised at the Rio Conference in 1992 through chapter 36 of Agenda 21 (Ogbugwe, 2006). In 2002 at the World Summit on Sustainable Development, education for sustainable development (ESD) was identified as a critical intervention area for furthering the goals of sustainable development at a global level. The United Nations General Assembly then declared the United Nations Decade of Education for Sustainable Development (UNDESD) (2005–2014) following the recommendation of the World Summit on Sustainable Development Plan of Implementation (Ogbugwe, 2006) and universities, among other higher education institutions, were challenged to play a role through their functions and operations. Universities are encouraged to utilise their core functions of teaching, research and community engagement to address sustainability issues in the contexts in which they operate (UNEP, 2006). In the ongoing process, they should inform and educate not only students, but also their employees and societies about sustainable development and the consequences of environmental degradation (Delakowitz & Hoffman, 2000).

While much faith has been placed in universities, they also face the problem of poor understanding of the concept of sustainable development (Katikiti, 2000). There are misconceptions of what the process of sustainable development entails and what sustainability represents to these institutions (Leal Filho, 2000). Carrying out sustainability assessments, especially at departmental level, is therefore important as it helps to establish how various

disciplines are conceptualising the contested and controversial concept of sustainable development, and also helps to establish the current status of sustainability work in progress.

This study is part of an ongoing project which is investigating a systems approach to mainstreaming sustainability issues into African universities. The broader project will develop a sustainability picture of Rhodes University from assessing various sections of the university, including teaching departments, operations and management, and student involvement. The study is situated in the Mainstreaming of Environment and Sustainability in Africa (MESA) Universities Partnership, and has been led by the United Nations Environment Programme and key partners such as the African Association of Universities, UNESCO and others since 2004 with the objective of enhancing the quality and relevance of university education through implementation of environmental education and sustainability across university operations and functions (Ogbugwe, 2007; UNEP, 2008). The MESA partnership programme is scheduled according to three phases which run for the duration of the UNDESD. The first phase (2004–2007), in which the objective was to establish and pilot the MESA Universities Partnership in 15% of universities, was successfully completed and participating universities have started mainstreaming environment and sustainability issues into their activities (UNEP, 2008).

The first phase of the MESA initiative was, however, heavily dependant on initiatives of individual MESA participants; thus among the key lessons learnt is the fact that there is need for a systems approach to expand and strengthen these initial efforts so as to bring about change at institutional level (UNEP, 2008). The second phase of the MESA Universities Partnership is aimed at consolidating and strengthening the partnership project activities in 30% of African Universities (UNEP, 2008). This ongoing study is oriented towards informing the second phase of the MESA Universities Partnership through supporting the establishment of tools for enabling a systems approach to sustainability in universities.

The study draws on critical realism (Bhaskar, 1978) as an underlying philosophy. One of the propositions put forward by critical realism is the belief that things do not happen by chance, but there are causal mechanisms that generate them. These mechanisms may exist unexercised, meaning recognition by critical realism that what has happened does not exhaust what could happen (Sayer, 2000). Critical realism proposes ontological distinction of reality into levels resulting in a stratified ontology; that is, the real level of objects, their structures and powers, the actual level of flows or consequences of events, and the empirical level of observed events (Benton & Craib, 2001). Critical realism also argues that the world is characterised by emergence; situations where the conjunction of two or more features give rise to new phenomena (Sayer, 2000). Stratified ontology is being used in the ongoing project to probe the causal factors influencing sustainability at Rhodes University, with the empirical and the actual levels forming the focus of the sustainability assessment while the real level will assist in probing mechanisms that can be activated to improve integration of sustainability issues (see also Lupele, 2008).

Systems thinking developed in response to the problem of science in dealing with complexity and is employed in the study as an epistemology. Classical natural science was said to be reductionist in the sense that it simplified reality by isolating components from a complex and messy world before analysing them piecemeal and derived properties of the whole directly from those of parts, thus leaving out emergent properties which result from the joining and

integration of the web of relationships between the parts (Banathy, 1997; Bertalanffy, 1968). The fundamental concept in systems thinking is therefore holism or organicism and this originated from early systems thinking which were meant to develop a consistent holistic approach of understanding complexities beyond the capability of a single discipline (Checkland, 1999). More recently, complex adaptive systems theory is also emphasising a new set of concepts, which include reflexivity, diversity and interactions, cross-scale dynamics, surprise and uncertainty (Folke, 2006). Such systems thinking considers 'structures and processes in a dynamic fashion' (Folke, 2006:259). Education systems like universities were classified as human activity systems, designed for a specific goal or purpose (Banathy, 1997). Systems thinking influenced the development and use of the Unit-based Sustainability Assessment Tool (USAT) (Togo & Lotz-Sisitka, 2008), which allows the construction of a 'whole' picture of sustainability at the university from sectoral and departmental assessments. It is also being employed to facilitate identification of major issues to be addressed at Rhodes University at the level of cross-faculty and cross-scale dynamics, so that mainstreaming of sustainability issues can be a university-wide initiative, located within a wider environment in which the university is located and interacts with. The study relies on the methodological process of abstraction to isolate individual objects of focus (which include processes of change and emergence) from complex and messy open social systems, so as to study them as individual components before building the whole picture again (Sayer, 1984).

Research Design

As part of the ongoing study, the USAT (Togo & Lotz-Sisitka, 2008) was developed based on a disciplinary framework where assessment would be possible at the level of individual departments or units. This unit-based framework was intended to cater for the multidisciplinary, multi-institutional and multi-process nature of sustainable development issues where initiatives, approaches or the dimensions addressed could possibly differ in various disciplines, departments, units and/or facets of university life (e.g. student activities or estates management). The alternative would have been to begin with a wide-scale assessment of the whole university, where detail specific to disciplines and units of activity might have been lost. This methodology has potential to provide for both – detail specific to disciplines and units of activity, *and* a wide-scale assessment at university level.

For this paper, the USAT was used to rate sustainability performance in the Department of Ichthyology and Fisheries Sciences, the Anthropology Department and the Accounting Department, in terms of integration of sustainability issues in their teaching, research and community engagement. The tool is divided into three parts intended for assessing sustainability in particular sections of the university's activities. Part A focuses on teaching, research and community service, Part B on operations and management, and Part C on students' involvement. Only Part A was used for the purpose of this study. It is composed of 20 indicators clustered into five groups, namely curriculum, teaching approach, research and service, examination, and staff expertise and willingness to participate (Table 1). The indicators were coded for easier graphical representation.

Table 1. USAT Part A scoring sheet outlining indicator clusters and codes

Code	Indicator	Score					
		x Don't know	0 None	1 A little	2 Adequate	3 Substantial	4 A great deal
Curriculum							
C1	The extent to which the department offer courses that engage sustainability concerns						
C2	The level of integration of sustainability topics in courses referred to above						
C3	The degree to which local sustainability issues and challenges form part of the department's teaching programme						
C4	The degree to which global sustainability issues and challenges form part of the department's teaching programme						
C5	The extent to which the department enrol students in courses that engage sustainability concerns						
Teaching approach: The extent to which the teaching approach contributes to development of the following characteristics among students:							
T6	The capacity to make informed decisions						
T7	Critical thinking skills						
T8	A sense of responsibility						
T9	Respect for the opinions of others						
T10	Integrated problem solving skills						
Research/service and scholarship activities							
R11	The extent to which the department (staff and students) is involved in research/service and scholarship in the area of sustainability						
R12	The degree to which global sustainability issues and challenges form part of the department's research and service						
R13	The degree to which local sustainability issues and challenges form part of the department's research and service						
R14	The extent to which your department is collaborating with other institutions and stakeholders in pursuit of solutions to sustainability problems						

Code	Indicator	Score					
		x Don't know	0 None	1 A little	2 Adequate	3 Substantial	4 A great deal
Curriculum							
R15	The extent to which aspects of sustainable development are used in selection/execution of research/service						
Examination of sustainability topics							
E16	The extent to which sustainability aspects are examined during course						
E17	The extent to which sustainability aspects are considered in evaluating projects/traineeships						
Staff expertise and willingness to participate							
S18	The level of expertise of staff members in the area of sustainability						
S19	The extent to which staff members are willing to carry out research and service activities on sustainability aspects/topics						
S20	The extent to which staff members are willing to teach sustainability topics						

Table 2. Assessment criteria

Rate	Meaning	Interpretation
X	Don't know	No information concerning the practice
0	None	There is total lack of evidence on the indicator
1	A little	Evidence shows poor performance
2	Adequate	Evidence shows regular performance
3	Substantial	Evidence shows good performance
4	A great deal	Excellent performance

The heads of the three departments were responsible for rating departmental performance basing on evidence demonstrating the presence of the identified indicators. The assessment criteria used was characterised by ordered response levels ranging from 0 to 4 while X was a response category where the head of the department lacked information regarding the practice (Table 2). Rating was done on the USAT scoring sheet outlining the indicators (Table 1).

The departmental sustainability assessments were accompanied by interviews and content analyses of documents. Only heads of the three departments were included in the study as they were well placed to give an overview of their departmental activities. An interview guide was used in data gathering. Content analyses of documents helped to clarify the nature of sustainability issues addressed by these departments, and provided a valuable triangulation mechanism to verify and extend the interview and USAT questionnaire data, enabling a more comprehensive picture of sustainability activities in each department to emerge. Analysed documents were as follows:

Department of Ichthyology and Fisheries Sciences

- Britz, P. & Davies, M. (2007). Review of the Department of Ichthyology and Fisheries experimental fish farm, unpublished, Rhodes University, Grahamstown.
- Ichthyology 201 handout, 2007.
- Ichthyology 301 handout, 2007.
- Ichthyology honours handout, 2007.
- Ichthyology 201 theory examination paper, 2007.
- Ichthyology 301 theory examination paper, 2007.
- Ichthyology honours theory examination paper, 2007.

Anthropology Department

- Owen, J. (n.d.). Research in anthropology. Retrieved from: <http://campus.ru.ac.za/index.php?action=category&category=1016> on 27 February 2007.
- Environmental Anthropology course guide, 2007.
- Anthropology of Tourism course guide, 2007.
- People and Parks course guide, 2007.
- Environmental Anthropology examination paper, 2007.
- Anthropology of Tourism examination paper, 2007.
- People and Parks examination paper, 2007.

Accounting Department

- Rhodes University (2007). Calendar 2007. Rhodes University, Grahamstown.

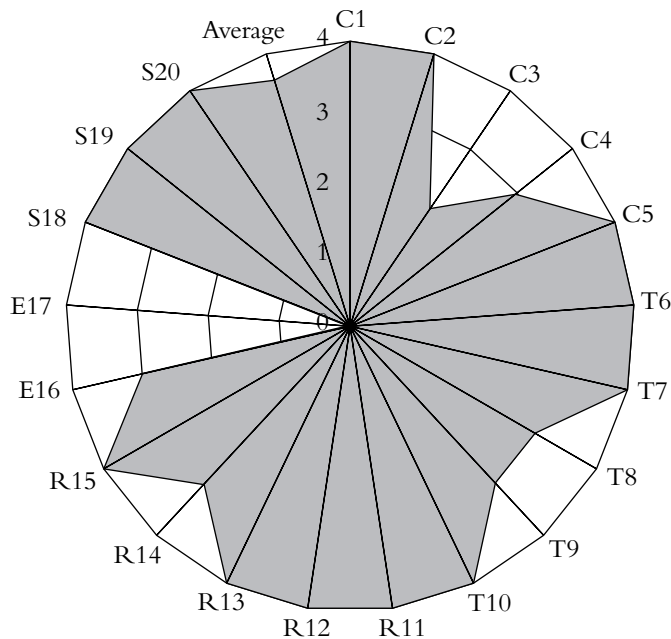
Results

The sustainability assessment revealed variations in the extent of integration of sustainability issues among the three departments examined. The Department of Ichthyology and Fisheries Science had the highest level of integration of sustainability (based on the USAT indicators) with a total score of 69 out of a possible 80 (86.3%). It was followed by the Anthropology Department with a total score of 49 (61.3%), while the Accounting Department had the smallest score of 23 (28.8%). There were differences in sustainable development issues addressed and the approaches used to deal with such issues. The teaching approach cluster scored highest in all three departments with the majority of indicators rating 3–4.

The Department of Ichthyology and Fisheries Science

Figure 1 is a graphical presentation of the results of the sustainability assessment in the Department of Ichthyology and Fisheries Science. Most of the indicators had high scores, showing high integration of sustainability issues across its activities. E17 was rated N/A (not applicable) as the activity represented by the indicator (evaluating projects/traineeships) was not part of the department's operations. According to the assessment criteria, this automatically translates to zero as it shows lack of evidence on the indicator (Figure 1). All the other indicators scored 3 to 4 – except C3, which scored 2. The average score for the department was 3.6.

Figure 1. Sustainability performance of the Department of Ichthyology and Fisheries Science



Content analyses of documents showed that the department is oriented towards sustainability issues. Its vision and mission statement reads:

To be a leading African academic institution supporting the sustainable utilisation and study of fish through the teaching and training of students, research and appropriate service provision. (Britz & Davies, 2007:3)

The department teaches fundamental knowledge about fish and the environment, for example anatomy, evolution, ecology and genetics. Besides that, it is involved in teaching about ecosystems, conservation, ichthyology, fisheries and resources management and aquaculture (Ichthyology 201, 301 and honours handouts). According to the interview, this 'helps society understand our environment which obviously contributes to sustainable management' (Participant 3, pers. comm., January 2008). The sustainability aspects that are taught during the course of

the programme are also examined. In 2007, for example, questions were on fish form and behaviour, fish environments, conservation, factors affecting fish populations and management of fish, design and management of aquatic ecosystems, and development of aquaculture as a food production industry (Ichthyology 201, 301 and honours 2007 examination papers).

The department is involved in projects more directed at managing the environment sustainably as well as applied work, such as devising management plans for aquatic systems. This includes a biological as well as an economic and a social dimension (Ichthyology 201, 301 and honours 2007 examination papers). Students undertake multidisciplinary or transdisciplinary projects with a developmental angle where they address biological and socio-economic issues. However, though they contextualise social and economic aspects, the department has a biological focus in its approach.

We do, broadly speaking, teach students about environmental management but with a focus on biology, but we do contextualise the relevant social and economic aspects. (Participant 3, pers. comm., January 2008)

In the community the department looks at livelihood opportunities, such as the utilisation of dams for fishing by Eastern Cape rural communities. It is working with provincial departments of agriculture to promote aquaculture (fish farming) in all the provinces and sustainable management of aquatic ecosystems. It reaches as far as the Southern African Development Community region (14 southern African countries) in development projects based on aquatic resource utilisation (Participant 3, pers. comm., January 2008).

These undertakings are complemented by the availability of staff members who are skilled in the sustainability area and who are also willing to teach and do research on sustainable development issues. High scores in the teaching approach cluster suggest that the department is promoting the development of skills necessary for a sustainable society.

The Anthropology Department

In the Anthropology Department most indicators rated between 2 and 3. The teaching approach cluster of indicators scored between 3 and 4. Only the examination and research clusters had some indicators scoring below 2 (Figure 2). The department's average score was 2.5.

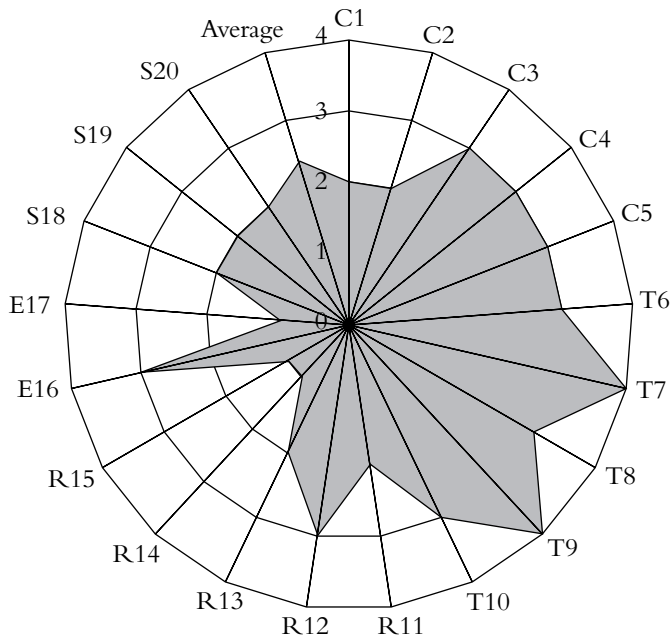
The department offers modules which address sustainable development issues. The Environmental Anthropology module focuses on the complex relationship between culture/society and nature/environment and the role of other social institutions like politics and economics in understanding environmental issues (Environmental Anthropology course guide, 2007). Among other issues, Anthropology of Tourism looks at the impact of tourism on local economies, culture and society (Anthropology of Tourism course guide, 2007). The People and Parks module is concerned with the complex relationship between people living within or close to parks and parks which in this case refer to 'all kinds of "natural" areas' which could be 'World Heritage Sites, national, provincial, urban and privately owned, as in game farms' (People and Parks Course Guide, 2007:1). The course explores the implications of the concept of sustainable development in the management of parks, as administrative policy has

gradually changed from an inhumane policy which dominated nature conservation and is being re-oriented towards rational access for residents and exploitation and sustainable use of park resources for local community development. Owen (n.d.) called anthropology 'a people-driven discipline' and evidence from the course guides show that the department places people at the centre of its activities. This department approaches sustainability issues from the point of view of how sustainability issues affect people. The 2007 examination papers for the mentioned courses show evidence of examination of the sustainability issues taught during the course (Anthropology of Tourism examination paper, 2007; Environmental Anthropology examination paper, 2007; People and Parks examination paper, 2007).

There are research activities taking place in the area of sustainability, as evidenced by the USAT results. Examples of sustainability issues researched/being researched by students include studies of how people obtain *muti* plants and the trade in those plants, tourism-related issues, people environments and medicinal plant use, to mention a few (Participant 1, pers. comm., December 2007). Some of their projects also reach out to communities. One example is a past interdisciplinary, collaborative research project by one of the staff members in the Dwesa-Cwebe region in the former Transkei, where local residents successfully campaigned for access to the Dwesa-Cwebe Nature and Marine reserve and were granted their land claim in 2001 (Owen, n.d.).

High scores in the teaching approach cluster of indicators suggest that the department is utilising teaching techniques which are said to promote the necessary skills for a sustainable

Figure 2. Sustainability performance of the Anthropology Department



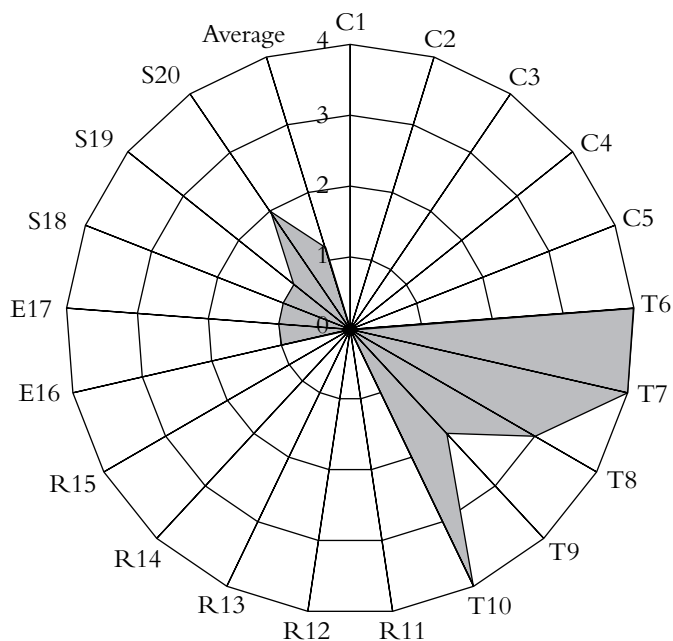
society (Figure 2). Its staff members can and are willing to teach, supervise and research sustainability issues (Participant 1, pers. comm., December 2007).

The Accounting Department

The Accounting Department had very low performance scores across all indicator clusters except teaching approach. All the indicators belonging to the curriculum and research clusters scored 0. Examinations and staff clusters were rated 1, except for S20 which scored 2. The average score for the department was 1.2 (Figure 3).

From the interviews, it was established that the department does not specifically teach sustainable development topics. They create awareness of these issues in Auditing and Financial Accounting when they teach students how to prepare financial statements, the tax effects of trading and how to audit that information (Participant 2, pers. comm., December 2007). Companies that are in resource-intensive operations like forestry or mining use natural resources and therefore face the question of conforming to regulations regarding their environmental impacts and rehabilitation. Financial statements therefore need to make provisions for such costs which may only occur years later. These financial statements are interpreted by different stakeholders, including environmental movement groups who may be interested in looking at the restoration processes in place. While these issues are not taught directly in courses, students have exposure to rehabilitation provisions through preparation of financial statements, thus capacitating them to pick up environmental accounting issues once they are in the work environment. Though they do not necessarily get the knowledge or understanding of what

Figure 3. Sustainability performance of the Accounting Department



the fundamentals entail, at least awareness is created (Participant 2, pers. comm., December 2007). Courses with sections on provisions include Financial Accounting 1, Accounting 2 and Accounting 3 (Rhodes University Calander, 2007). The department offers Ethics as a course and it has a section which deals with corporate social responsibility, a concept directly related to sustainability issues. The approach of the department is therefore to address sustainability issues as far as they affect the financial well-being of companies. In addition, the students have an awareness of other environmental issues outside the department through Economics; and requirements of certain acts (e.g. for land restoration/rehabilitation) through Commercial Law.

The major factor inhibiting the department's response to sustainability issues is the curriculum which they follow. It follows the curriculum of the Institute of Chartered Accountants, which is said to have too many requirements and is so demanding that there is just no space to fit anything else in to the curriculum. There is even a task team trying to address ways of reducing the curriculum's demands (Rhodes University Calander, 2007). The other problem is failure by the department to attract staff members. The department's research is generally in the field of taxation and there is nothing which deals with sustainable development. The department also did not have any community engagement initiatives at the time of the interview. This was however not due to a lack of interest or expertise (Figure 3), but as a result of staff shortages (Rhodes University Calander, 2007).

Discussion

Evidence from the study shows discrepancies in levels of integration of sustainability issues among the three departments. At the same time, the issues being addressed by these departments and the approaches used are also different. Differences in levels of integration of sustainability issues could be due to variations in the disciplines that in turn dictate the core teaching and research activities in each department. Thus, each department accommodates sustainable development issues as far as they interrelate with the core purpose and orientation of their discipline, while guarding against loss of focus or from too much divergence from its core mission. The Department of Ichthyology and Fisheries Science is concerned with the study of fish and fish environments, and sustainability of both is part of its mission. This may explain the high scores from the USAT evaluation. The strong biological focus of the department shows that it uses an ecological approach in addressing sustainability issues through which relevant social and economic issues are contextualised.

The main concern in the Anthropology Department is people, and sustainability issues are regarded in as much as they affect people (positively or negatively). Putting people's well-being first shows that the department addresses sustainability from a social angle. The Accounting Department, by mainstreaming only those sustainability issues which affect the financial well-being of the company in question, takes yet another stance which is more of an economic rather than either social or ecological approach.

The way the three departments approach sustainability is different to such an extent that it seems to be due to differences in appreciation of the dimensions of sustainable development. Variations in levels of integration of sustainability issues may be a result of differences in the

nature of the disciplines in terms of accommodating such issues. The disciplines also seem to be allowing for particular approaches in addressing sustainability issues and at the same time restricting the kind of issues to be addressed. In the Accounting Department, other factors like the mentioned staff shortages may have played a role in the low scores obtained across the indicator clusters. This situation does not provide insights into how best to approach issues of mainstreaming sustainability, or what sustainable development issues are relevant and/or a priority in the university's context, but it does indicate that diversity of interpretation and disciplinary orientation are likely to affect the mainstreaming process.

In addressing sustainability, multi-disciplinary approaches are important given the contested, controversial and multi-dimensional nature of the challenges. There is no simple solution to sustainability and diversity of approaches is crucial – to be valued in complex adaptive systems oriented towards resolution of socio-ecological and sustainable development issues (Folke, 2006). Folke (2006) argues that patterns of interaction can emerge from disorder through rules that guide change. Arguing along almost similar lines with Folke (2006), Wals (2007) maintains that diversity and contradictions can provide learning opportunities in ESD and social learning for sustainability owing to the complex nature of sustainable development challenges. Diversity can therefore be a necessary condition in the development of a system as it allows for depth and engaged interactions. Such interactions may result in system elaboration and re-organisation, things which may not have taken place if the system was in equilibrium.

What may be necessary is to look into issues of developing a shared understanding of sustainable development and defining priority sustainability issues in the university's context. Disciplinary capabilities can then be taken advantage of in contributing towards common sustainability objectives. This would see departments at the university working as components of a system with a shared goal where sustainability issues are concerned. The idea is not to force departments to work on similar sustainability issues or to use similar approaches. What may be needed is a contextual redefinition of sustainability goals to which each department will then contribute in its unique way. From the three cases, one may, for example, ask how each department with its disciplinary orientation to sustainability would be able to contribute to, for example, resolution of critical sustainability issues at a wider societal level such as climate change, loss of ecosystem services, a lack of social justice in resource flows and production economics, HIV/AIDS, or water scarcity. One could use examples of issues affecting southern Africa, South Africa and the Makana District (the immediate environment surrounding Rhodes University).

Results of the USAT give a good indication of the amount of sustainability work going on within departments. The tool was quick and easy to use and had the advantage of being unit-based; which, in the teaching departments, enabled assessing sustainability in only the selected departments as a starting point for assessing integration of sustainability issues across the university. Results were easy to represent graphically and to interpret, and indicators with low scores can be quickly determined. Comparing performance among different departments is also possible. General trends across departments can also be established, e.g. one can quickly notice that the teaching approach cluster of indicators obtained high scores in all three departments. In investigating a systems approach to mainstreaming sustainability issues by the university, this will provide a good guideline of the current state of mainstreaming activities.

The USAT does, however, not give an indication of the aspects of sustainable development integrated by these departments. The scores are not representative of the performance of the departments in relation to a wider framework of sustainability challenges as each department was rated within the confines of its discipline. A good example is the Department of Ichthyology and Fisheries Science where USAT results show that sustainability issues are highly integrated in departmental activities. Content analysis also revealed that it is an integral part of their mission. However, their focus is on fish and fish environments, which is only a fraction of the ecological dimension of sustainable development issues. The USAT does not show that it's only one dimension of sustainable development that has been integrated. The USAT is also subjective as it is based on the opinion of the assessor. The study thus employed interviews and content analyses of documents to complement and triangulate data from the USAT.

Sustainability assessments should go beyond the empirical level of reality, which only reveals what is happening at the surface, to consider what is not happening, as this maybe a good guide to unravelling issues that are important but are not being addressed. As explained by Sayer (2000), this may help in discovering unexercised mechanisms that can be activated – in this case to improve the sustainability performance of the university. Examples of such unexercised mechanisms in the case of the Accounting Department include a willingness to participate in sustainability-related community engagement activities and the existence of staff expertise in sustainability issues, both of which are not being taken advantage of as a result of other inhibitive factors such as staff shortages.

The study does not give answers to the question of how to promote institution-wide mainstreaming activities of environment and sustainability issues. Instead, it discloses differences in levels of integration of sustainability issues and in approaches being employed by departments within the university. It divulges the contested and controversial nature of sustainability issues even at such a small scale. It should be a challenge to the university to find a way for the departments to work with sustainable development in a deliberative way.

Conclusion

While the three departments examined are approaching the sustainability question from varied angles, the study has shown that there is capacity in these diverse disciplines to contribute in their different ways to sustainable development issues. All three disciplines have something to offer by way of contribution to mainstreaming environmental and sustainability issues. Even though their approaches differ, they each touch more or less on all three major dimensions of sustainable development; that is, ecological, economical and social dimensions. The university can therefore take advantage of these efforts in promoting mainstreaming activities. The current *modus operandi* is, however, not holistic and hence leaves room for disciplinary tensions within the university over approaches and priorities. This is one of the systemic challenges that the university faces if mainstreaming of these issues is to be promoted as an institutional initiative. Theory associated with complex adaptive systems and social learning proposes that such tensions may be productive advocates for change and responsiveness (Folke, 2006).

There is need to create a mutual understanding of what sustainable development means and entails within the context of the university.

The university also faces the challenge of addressing problems faced by individual departments in mainstreaming sustainable development issues (such as staff shortages) in order to further develop the capacity of these departments to work with sustainability issues relevant to their disciplines and to wider society. It should deal with obstacles inhibiting the realisation of some of the interests of individual departments and at the same time take advantage of initiatives in place. Individual departments could also make an effort to create capacity within their disciplines to accommodate sustainability issues. The university is also challenged to build further synergy from what may seem to be isolated and fragmented departmental efforts. At present there are various initiatives in place to do this; such as the co-ordination of a Makana Research Group, which is looking at what overlaps and synergies exist between departmental research initiatives and sustainable development issues in the Makana District, and a community engagement co-ordination process, which is seeking to identify synergies between diverse community engagement initiatives established by different departments and units in the university. This study, and its investigation of a systems approach to mainstreaming environment and sustainability at Rhodes University, represents another similar intervention.

Notes on the Contributor

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Endnote

1. This paper forms part of a more in-depth PhD study involving a larger number of departments, research units, student activities and co-ordination mechanisms at Rhodes University, which is used as a case study for exploring the potential of a critical realist orientation to systems thinking for mainstreaming environment and sustainability in African universities (Togo, forthcoming).

References

- Badat, S. (2007). The challenges of education and development in the twenty-first century. Keynote address at the Imbewu Programme Review Conference, Nelson Mandela Metropolitan University, Port Elizabeth, 28 June 2007.
- Banathy, B. (1997). A taste of systemics. The first international electronic seminar on wholeness. International Society for the Systems Sciences (ISSS) and International Institute for Systemic Inquiry and Integration (IISII). from http://www.newciv.org/ISSS_Primer/seminar.html, visited July 13, 2007

- Banerjee, S.B. (2003). Who sustains whose development? Sustainable development and the reinvention of nature. *Organisation Studies*, 24(1), 143–180.
- Benton, T. & Craib, I. (2001). *Philosophy of social science: The philosophical foundations of social thought*. Hampshire: Palgrave.
- Bertalanffy, L. (1968). *General system theory: Foundations development applications*. London: Penguin.
- Bhaskar, R. (1978). *A realist theory of science*. Sussex: Harvester Press.
- Carter, N. (2001). *The politics of the environment: Ideas, activism, policy*. Cambridge: Cambridge University Press.
- Checkland, P. (1999). *Systems thinking, systems practice*. Chichester: John Wiley and Sons.
- Delakowitz, B. & Hoffman, A. (2000). The Hochschule Zittau/Gorlitz: Germany's first registered environmental management (EMAS) at an institution of higher education. *International Journal of Sustainability in Higher Education*, 1(1), 33–47.
- Folke, C. (2006). Resilience: The emergence of a perspective for social-ecological systems analysis. *Global Environmental Change*, 16, 253–267.
- Folke, C., Carpenter, S., Elmqvist, T., Gunderson, L., Holling, C. S., et al. (2002). Resilience and sustainable development: Building adaptive capacity in a world of transformations. Scientific background paper on resilience for the process of the World Summit on Sustainable Development on behalf of the Environmental Advisory Council to the Swedish Government. Stockholm: Environmental Advisory Council.
- Haque, S.M. (2000) Environmental discourse and sustainable development: Linkages and limitations. *Ethics and the Environment*, 5(1), 3–21.
- Holling, C. S. 1973. Resilience and stability of ecological systems. *Annual Review of Ecology and Systematics*, 4, 1–23.
- Jickling, B. (2005). Sustainable development in a globalising world: a few cautions. *Policy Futures in Education*, 3(3), 251–259.
- Katikiti, S. (2000). Appendix 1. University and sustainability life: An African perspective. In Leal Filho, W. (Ed.), *Sustainability and university life* (2nd edn). Frankfurt: Peter Lang. pp.19–30.
- Leal Filho, W. (2000). Sustainability and university life: Some European perspectives. In W. Leal Filho (Ed.), *Sustainability and university life*, (2nd Ed.) (pp 19–30). Frankfurt: Peter Lang.
- Lupele, J. (2008). Underlying mechanisms affecting institutionalisation of environmental education courses in southern Africa. *Southern African Journal of Environmental Education*, 25, 111–129.
- Ogbuigwe, A. (2006). Mainstreaming environment and sustainability into African universities partnership awards for education for sustainable development innovations programmes in African universities. <http://www.unep.org/training/mesa/awards.asp>, visited 19 July 2007.
- Ogbuigwe, A. (2007). Education for sustainable development. <http://www.research-africa.net/media/pdf/UNEPR5.pdf>, visited 14 August 2007.
- Pittel, K. (2002). *Sustainability and endogenous growth*. Cheltenham: Edward Elgar.
- Sayer, A. (1984). *Method in social science*. London: Hutchinson.
- Sayer, A. (2000). *Realism and social science*. London: Sage.

- Togo, M. (forthcoming). A systems approach to mainstreaming environment and sustainability in universities: The case of Rhodes University, South Africa. Unpublished PhD thesis, Department of Education, Rhodes University, Grahamstown.
- Togo, M. & Lotz-Sisitka, H. (2008). Unit-based sustainability assessment tool. Unpublished resource book to complement the UNEP Mainstreaming Environment and Sustainability in African Universities Programme. Rhodes University, Grahamstown.
- Tünnermann Bernheim, C. & de Souza Chaui, M. (2003). *Challenges of the university in the knowledge society, five years after the World Conference on Higher Education*. UNESCO Forum Occasional Paper Series, Paper no. 4, produced for the UNESCO Forum Regional Scientific Committee for Latin America and the Caribbean. [http://portal.unesco.org/education/en/file_download.php/697c33597621cdab0b77507d31da8cf8Tunnerman+\(English\).pdf](http://portal.unesco.org/education/en/file_download.php/697c33597621cdab0b77507d31da8cf8Tunnerman+(English).pdf), visited 18 July 2007.
- UNEP (United Nations Environment Programme) (2008). *Mainstreaming Environment and sustainability in African universities partnership: Supporting universities to respond to environment, sustainable development and climate change challenges. 2004-2008 Report*. Nairobi: United Nations Environment Programme.
- UNEP (2006). *Education for sustainable development innovations: Programmes for universities in Africa*. Share-Net: Howick.
- Walker, B.H., Anderies, J.M., Kinzig, A.P. & Ryan, P. (2006). Exploring resilience in social-ecological systems through comparative studies and theory development: introduction to the special issue. *Ecology and Society* 11(1): 12. <http://www.ecologyandsociety.org/vol11/iss1/art12/>, visited 13 August 2008:
- Wals, A.E.J. (2007). Epilogue. Creating networks of conversations. In Wals, A.E.J. (Ed.), *Social learning towards a sustainable world: Principles, perspectives, and praxis*. Wageningen, The Netherlands: Wageningen Academic Publishers. pp.497-506.
- WCED (World Commission on Environment and Development) (1987). *Our common future*. Oxford: Oxford University Press.

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- Participant 1 (2007). Anthropology Department, Rhodes University, Grahamstown, 4 December 2007.
- Participant 2 (2007). Accounting Department, Rhodes University, Grahamstown, 5 December 2007.
- Participant 3 (2008). Department of Ichthyology and Fisheries Science, Rhodes University, Grahamstown, 17 January 2008.