The Unit-Based Sustainability Assessment Tool and its use in the UNEP Mainstreaming Environment and Sustainability in African Universities Partnership

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Abstract This paper reports on the development and use of a Unit-based Sustainability Assessment Tool (USAT) for establishing the status of Education for Sustainable Development initiatives and sustainable development practices in universities. The tool was developed for use in the Swedish/Africa International Training Programme (ITP) on 'Education for Sustainable Development in Higher Education' and complements the UNEP Mainstreaming Environment and Sustainability into African Universities (MESA) '*Education for Sustainable Development Innovations Programmes for Universities in Africa*' materials. The USAT facilitates a quick assessment of the level of integration of sustainability issues in university functions and operations, both to benchmark sustainability initiatives and identify new areas for action or improvement. It is basedon a unit-based framework which allows for sustainability assessments to be done per division, unit, department, or faculty within universities. Collectively, the unit-based assessments provide for development of an institution wide picture of university sustainability. The USAT has been widely used, in different ways, in African universities which are participating in the MESA Universities Partnership, and it has been found that it provides a useful reflexive learning tool for furthering sustainability objectives. This chapter discusses the context in which the USAT was developed, its development and pilot use at Rhodes University and the design features of the tool. The chapter also showcases use of the USAT in a whole university assessment at the University of Swaziland to illustrate how data from the assessment can be analyzed and presented and what the tool enables reviewers

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to perceive from the results. It further illuminates how the tool is being employed in identifying actions for change (called change projects) in the MESA Universities Partnership. Use of the USAT across a range of African universities suggests that its value lies in showing the level of integration of sustainability, and in facilitating change oriented learning and practice.

Introduction

The Unit-based Sustainability Assessment Tool (USAT) was developed and is being used during a time when education is increasingly being recognized to be one of the central approaches to sustainable development. The role of education in sustainable development was emphasized through Agenda 21 at the Earth Summit in Rio de Janeiro in 1992. This same vision was later consolidated at the United Nations general assembly in 2002 when the Decade of Education for Sustainable Development (ESD) (2005–2014) was declared following the recommendation of the World Summit on Sustainable Development (WSSD) Plan of Implementation (UNESCO 2005), showing the significance of education and learning in responding to the challenge of sustainable development. UNESCO defined the overall goal of the UN Decade of Education for Sustainable Development (UNDESD) as:

> … to integrate the values inherent to sustainable development into all aspects of learning to encourage changes in behaviour that allow for a more sustainable and just society for all (UNESCO 2005, p. 1).

Universities were challenged to become key players in educating society about sustainable development (UNEP 2006) through developing the capacities of future decision-makers; developers and managers of business and industry; and other social institutions (University Leaders for a Sustainable Future (ULSF 1990). They also have significant influence on policies and decision-making at government level and in industry and other types of organizations.

A number of international conferences on environmental education and sustainable development, for example the Talloires conference (France 1990), made declarations which define university roles in addressing sustainable development. Priority roles of universities in sustainable development defined through these declarations include the following:

- developing ecological literacy among students to prepare them to deal with environmental problems,
- applying their (universities) knowledge in solving the problems of local communities,
- establishing and implementing sustainable physical operations,

- aiding the development of an environmentally literate people through public outreach,
- developing interdisciplinary curricula,
- encouraging research that contributes to local, regional, and global sustainability,
- collaborating with government, non-governmental organizations, and industry, and
- cooperating with other universities to facilitate sharing of information pursuing practical solutions to sustainability issues (Wright 2002, pp. 214–218; 2004, pp. 13–17).

The green economy (UNEP 2009), which is one of the recent topical approaches to sustainable development also identifies capacity building, training, and education through strengthening national capacity to respond, as one of the enabling conditions for a sustainable society (UNEP 2011). ESD was also emphasized in the recent Rio + 20 outcome document through resolution 233, which emphasizes promotion of ESD beyond the DESD. Resolution 234, which focuses on the role of education institutions, says:

> We strongly encourage educational institutions to consider adopting good practices in sustainability management on their campuses and in their communities with the active participation of, inter alia, students, teachers and local partners, and teaching sustainable development as an integrated component across disciplines. (United Nations 2012, p. 44).

It is within this context of an increasing realization of the role of education that the United Nations Environment Programme (UNEP) initiated the development of universities partnership in 2004 to help African universities to mainstream sustainable development in their operations. The partnership, Mainstreaming Environment and Sustainability in Universities in Africa (MESA) Universities Partnership, is aimed at enhancing the quality and relevance of university education through implementation of Environmental Education and sustainability across university operations and functions (Ogbuigwe 2007). The MESA Universities Partnership is in direct response to the objectives of the UNDESD and is structured into three phases[1] that run for the duration of the UNDESD (2005–2014). The first phase (2004-2007), aimed at establishing and piloting of the MESA Universities Partnership in 15 % of universities, was successfully completed (UNEP 2007) but was found to have heavily depended on individual professionals participating in the MESA Universities Partnership. Sustainability mainstreaming initiatives started by the professionals were not being taken up at university level in their institutions. A *'systems-wide approach to mainstreaming'* was therefore found necessary (UNEP 2007, p. 4), emphasis in original) so as to

[1] Phase 1 (2004–2007): Establishing and piloting of the MESA Universities Partnership Project in 15% of African Universities; Phase 2 (2007–2010): Consolidation and strengthening of MESA Universities Partnership Project activities in 30 % of African Universities; and Phase 3 (2011–2014): Expansion of the MESA Universities Partnership to 60 % of African Universities (UNEP 2007, p. 1).

bring change at an institutional level rather than in individual courses/teaching contexts of MESA participants only (UNEP 2008). The need for developing further tools to support such an approach was also identified (ibid.). This tool was therefore developed to support phase 2 of the program in which:

> A stronger *systems-approach* needed to be developed in MESA to support systemic changes in universities, so that innovations were not only dependent on individual efforts and *university leaders* needed to become more involved (UNEP 2008, pp. 32) (emphasis in original).

The USAT (Togo and Lotz-Sisitka 2009) was developed to support mainstreaming of sustainability in the MESA Universities Partnership, and to provide a means of facilitating change oriented learning and practice in participating universities. It was developed as part of a PhD study situated within the MESA Universities Partnership, which explored the development of systems approaches in mainstreaming environment and sustainability in African universities (Togo 2009). The tool was developed in response to lessons from phase 1 of the program, particularly, the need for a stronger systems approach to enable take up of initiatives by the MESA Universities Partnership participants at university level. Sustainability Assessment Tools (SATs) help define priorities for universities while at the same time providing a basis for institutions to compare and reflexively review their sustainability efforts. The tool was also meant to articulate criteria/priority issues for African universities from the roles of universities defined through sustainability declarations in higher education to consider their relevance in African university contexts, and to explore if other perspectives needed to be brought into the picture. The research, which developed the USAT, was based on a case study of Rhodes University and developed an in-depth understanding of a whole systems approach to sustainability mainstreaming and how the tool can be used to support such an approach (Togo 2009).

The Development and Design Features of the USAT

A Review of Other Tools

The priority sustainability mainstreaming issues defined through the indicators of the USAT were influenced by other SATs and also aligned with the roles of universities defined by sustainability declarations. Before its development, the relevance of some of the existing SATs to the study and by extension, in supporting a system approach in mainstreaming sustainability in the MESA Universities Partnership, was considered. These include the Sustainability Assessment Questionnaire (SAQ) (ULSF 1999), the Auditing Instrument for Sustainability in Higher Education (AISHE) (Roorda 2001) and a tool for the Graphical Assessment of Sustainability in Universities (GASU) (Lozano 2006).

The SAQ offers its users a comprehensive definition of sustainability in higher education (Shriberg 2004), covering critical dimensions of higher education, that is: curriculum, research and scholarship, operations, faculty and staff development and rewards, outreach and service, student opportunities, and institutional mission, structure and planning (ULSF 1999). As Shriberg (2004) argues, the questionnaire was found to have a clear focus on sustainability and sustainability processes and to be helpful in designing sustainability strategies at local level. However, the SAQ was found to be not quite suitable to support the MESA Universities Partnership because it is primarily qualitative and hence responses cannot be used to rate or compare institutions (ULSF 1999). The SAQ also assess sustainability at the level of the whole institution which can potentially mask any good practices taking place in individual departments and units. This was going to make the required form of intervention in the case of the MESA Universities Partnership difficult, that is, strengthening individual sustainability practices into university-wide initiatives.

The AISHE makes it possible to decide by internal or external auditing, to which level the university (or a part of it) has succeeded in implementing sustainability. It consists of 20 criteria within five fields of attention, namely: vision and policy, expertise, educational goals and methodology, education contents, and result assessment (Roorda 2001). It is aimed at expanding sustainability efforts across Europe and the world, resulting in certificates, awards, and other forms of recognition for users. The AISHE can foster participation in the auditing process and is a good example of a process-oriented approach to sustainability assessment (Shriberg 2002). However, the AISHE criteria are abstract and difficult to understand and the tool does not explicitly include indicators on motivations for pursuing sustainability (ibid.).

The GASU was developed through modification of the Global Reporting Initiative Sustainability Guidelines to facilitate the analysis, longitudinal comparison, and benchmarking of universities' sustainability efforts and achievement (Lozano 2006). The Global Reporting Initiative guidelines which are inclusive of the three dimensions of sustainable development (economic, environment/ecological, and social) were modified to include education as one of the dimensions; to make them suitable for universities (ibid). The GASU uses indicators grouped under economic, environmental, social, and educational dimensions and offers a condensed graphical overview of these (Lozano 2006). Its major strength lies in the fact that it is indicator-based (ibid.), which makes it better in terms of transparency, consistency, and usefulness for decision-making over accounts and narrative assessments. It can also be used to measure and compare progress, two aspects which Shriberg (2002) identified as most difficult in assessing sustainability in higher education. However, the GASU indicators were found to fall short of some of the roles of universities defined through sustainability declarations and relevant in the African context.

While these tools were found to have their strengths in assessing sustainability in universities, none of them fully satisfied the features sought by the study. One of the main critiques, from the point of view of the PhD study (Togo 2009), is that the tools audited sustainability at university level and did not capture initiatives taking

place at departmental level well enough, except as examples. Since the university tends to be managed via departments and unit heads in a broader management system, it was found necessary to develop a tool that allowed for a unit-based framework, but which could also produce systems-wide data. Such a tool needed to give an insight into the 'whole' picture of sustainability in universities but needed to allow for flexibility so that it could be used at department, faculty, and division (or unit) level to guide assessment of university-wide change initiatives so as to identify potential areas of intervention. We also needed a tool that could be used at various levels of the university system to initiate reflexivity and change oriented learning and practice.

The SAQ, AISHE, and GASU were therefore reviewed and adapted, and provided a basis for developing indicators for a USAT (Togo and Lotz-Sisitka 2009) (USAT, see Appendix 1A-D). The USAT has built-in flexibility which enables it to be used at departmental or unit level and across the entire institution. The tool was informed by both the strengths and shortcomings of the other three SATs and was designed to be easy and quick to use, indicator-based for benchmarking and comparative purposes; and to be applicable in individual departments and units hence not requiring much effort in the assessment. It also attempts to meet some of the ideal features of good SATs like being able to address contextually appropriate issues important to campus environmental and socio-economic efforts; enabling benchmarking and assessment of efforts over time while making comparison of efforts possible; and being comprehensible to various stakeholders Shriberg (2002, pp. 74–76).

Methodologically, the tool was based on a whole systems approach and was also influenced by critical realism. The tool was intended for use in a whole university context and therefore was designed to assess sustainability in all the operations and functions (components) of a university. While the whole systems approach (Sterling 2003, 2004) argues that the whole institution is of concern, Archer (1995, p. 14), in her theory of social change, argues that different strata (or units) may possess different emergent properties and powers different to the powers of other strata thus may have unique "independent causal influences" which influence the whole in different ways. For example, one faculty or unit may have different structures, histories, cultures, priorities, resources, actors, etc., to another, and may therefore influence the whole system in dissimilar ways. The USAT was developed in such a way that it can be used to study teaching departments and other institutional units at a university separately to capture possible differences in sustainability mainstreaming due to different influences and emergent properties of these departments which result in unique impacts/influences on the whole institution. If units are not differentiated in the analysis, areas of success and areas of possible intervention may be overshadowed, and may remain poorly understood in the context of the whole. The unit-based structure of the tool which enables use at departmental level still allows a whole picture of sustainability mainstreaming at the university to be built from these assessments as will be discussed later.

Piloting the USAT

Sustainability Assessment at Rhodes University

The USAT was initially developed with three parts: A, B and C. That original version was employed to assess sustainability in the whole institution at Rhodes University (Togo 2009). The assessment, while it was in response to the research questions of the Ph.D., was also part of the development process of the tool and helped to inform its further refinement.

The sustainability assessment, guided by critical realism's levels of reality (Sayer 2000), was meant to establish the sustainability practices taking place and the level to which the practices were mainstreamed in selected departments and divisions at RU (the critical realist empirical level of observed events (ibid)). The process followed in the assessment was that of going through the relevant part of the USAT together with the assessor so as to clarify some of the indicators (where necessary). Two printed copies of the USAT were used with both the assessor and the Ph.D. researcher recording the scores that the assessor allocated for each of the indicators. The assessment was also tape recorded (with prior consent) and this helped both to verify the scores later and to capture the discussion surrounding the assessment for possible elaboration and justification for the scores.

The assessment enabled identification of a few errors in the original tool which were then corrected. These included repetition of numbering for some indicators and similar codes for some indicators which had to be re-coded. Most important however, the USAT enabled establishment of the level of integration of sustainability in the various operational divisions of the university. It was also found possible to build a whole picture of university sustainability in teaching departments from Part A of the tool. The Rhodes University assessment also validated the choice of HODs as suitable respondents in carrying out sustainability assessments as they were all found to be knowledgeable of the operations of their departments or units. This was validated through the use of X as one of the criteria for rating performance to help check quality of responses (this will be further explained in the next section). X indicates lack of information on the practice.

USAT Piloting Within the MESA Universities Partnership

Just after its use at Rhodes University, the tool was developed into a draft booklet for wider piloting in the MESA Universities Partnership. This pilot version of the tool, developed in 2008, was mainly used by members participating in MESA Universities Partnership to identify possible change actions (named 'change projects') in their institutions (UNEP 2008). These can be curriculum changes, campus management changes, or policy changes (amongst others) that contribute towards a more sustainable university. About 18 universities from different African countries; out of a total of 23 universities participating in the partnership's staff development program that year; used it to identify their change projects.

The tool was employed in different ways (some used only one part) and in various contexts. This facilitated checking the quality of the tool, usefulness when the assessment is done by other users who are not necessarily the researchers who developed it, and its relevance in and adaptability to different contexts. The researchers obtained important feedback on the tool which led to its improvement to suit a broader context, including a recommendation which led to the development of Part D which focuses on policy issues.

A Unit-Based Design and Indicators

This section briefly outlines the design features of the USAT. For a full explanation, please see the USAT booklet developed for the MESA Universities Partnership (Togo and Lotz-Sisitka 2009). The current four parts of the tool focus on different operational functions of the university. Each of the parts define criteria for mainstreaming sustainability for the intended division, but, at the same time, leaving room for modification of indicators depending on the context in which the tool is being used. The tool is also open ended and allows users to add any relevant indicators which may not have been captured but are relevant in some contexts. This makes it adaptable to various contexts. The GASU informed the development of indicators that are measurable, their rating and graphical representation of the results of sustainability assessments.

Part A pays particular attention to the core mission of universities and covers curriculum, teaching approach, research, community service activities, examinations/assessment and staff expertise. Generally the indicators help to establish the levels of integration of sustainability in teaching, research (including the level to which such content is examined), community service and sustainability partnerships. Some of the indicators were informed by the AISHE especially those focussing on teaching approach and examination. Staff expertise in sustainable development and staff willingness to be involved in sustainability practices was also included as, without expertise and even willingness to participate, mainstreaming of sustainability becomes a challenge (see Appendix A.1).

Part B (Appendix B.1) deals with other university operations and the management of the university, including estates division as well as management divisions like human resources, planning, and research. It was modeled on the operations section of the SAQ which identifies practices that are emphasized by institutions moving toward sustainability internationally (ULSF 1999). The idea is to benchmark or get a snapshot of the institution's sustainability performance in practices like waste management, air pollution reduction, energy conservation, water conservation, landscaping, transportation programs, purchasing, etc. In addition to rating, Part B also requires the assessor, among other things, to indicate what can be done to improve the practice.

Part C drew on the SAQ to design as set of indicators for student involvement in sustainability and considers the way students are involved in the operational

management of the university (e.g., are student groups involved in recycling, waste management, or energy saving initiatives on campus?). Such initiatives can be linked to other activities (as outlined in Part A, B, and C of USAT) or they can be self-initiated, independent initiatives taken by students outside of the mainstream teaching, research, and management activities of the university. Part C indicators, like Part B also requires the assessor to indicate key areas and to show where he/she does not have adequate information regarding the practice, and, in addition, to give an outline of the actual activities on the ground (Appendix C.1).

Part D which also partly drew on the SAQ (ULSF 1999) is targeted at university managers; is designed to assess sustainable development related policy at various levels, and other university written statements. It focuses on integration of sustainability in higher education policy and the degree to which the policy is shaped by national and global sustainability issues and strategies. It also considers the degree to which institutional policies and written statements show commitment of the university to national and global sustainable development agendas.

Coding of Indicators

The indicators were coded for no other reason than to allow ease of representation in tables and graphs. Most of the indicators are wordy and it was going to be a challenge representing then graphically without coding.

Rating of Indicators

The rating of identified activities (for all USAT parts) is based on evidence indicating the presence of the identified indicators and practices. This results in ordered response levels (Uebersax 2006) loosely based on the Likert scale. Explanation and translation of the scales into percentages; and graphical representation of assessment results was based on the GASU (Lozano 2006). Respondents selected the score from 6 choices ranging from X to 4 where:

- X (don't know): lack of information but not necessarily an absence of such information.
- 0 (none): absence of information regarding the indicator (about 0 % of such information).
- 1 (a little): poor performance in the concerned indicator (about 25 % of full information regarding the indicator).
- 2 (adequate): regular performance (about 50 % of full information required by the indicator).
- 3 (substantial): good performance (about 75 % of full information required by the indicator).
- 4 (a great deal): excellent performance (more than 75 % of full information required by the indicator).

Identification of Respondents

While the USAT is used at the level of individual departments/divisions, there is need for identifying a suitable and knowledgeable respondent for quality data. The USAT uses a built-in quality check mechanism, the rate 'X', to ensure that the respondent to the assessment has adequate knowledge regarding the work of the department or division. Where more than 40 % of the indicators are rated X (don't know), this is used as an indicator that there is need to identify another, more knowledgeable main respondent. As mentioned earlier, heads of divisions and departments were found to be knowledgeable enough to perform the assessments at Rhodes University. However, the use of X as a quality checking mechanism was maintained in the final USAT in case of irregular circumstances, like, for instance, where a new HOD has no full understanding of the department's operations.

Analysing USAT Data

For Part A, USAT data can be presented in table form or graphically in radar diagrams (after Lozano 2006) and histograms. Radar diagrams can be developed for each of the departments in which sustainability assessment was done and a whole university picture can be built from the assessment of individual departments. This will be demonstrated in the section showcasing a whole university assessment at the University of Swaziland (UNISWA). For Part B to D, sustainability assessment can be done for the whole university with persons heading the university's Estates Division (Part B); the student representative council or student environmental society (Part C) and the planning division of the university (Part D). In that case, data are represented in radar diagrams, in the same way as the data for individual teaching departments, but will be representing overall university performance. While this is the way the tool was used at Rhodes University, UNISWA and other contexts, Part B to D can also be used at the level of individual divisions if the identified practices exist at levels lower than the overall university. A whole university picture for the assessment will then be developed from the individual assessments in the same way as USAT Part A data.

A Systems Approach to Change Initiatives in the Mesa Universities Partnership

Whole University Assessment of Curriculum and Pedagogy at UNISWA

The sustainability assessment that was done at UNISWA is part of the MESA Universities Partnership sustainability mainstreaming practices. The objective of

the assessment was to determine the extent to which the university was responding to issues of environment and sustainable development through its operational functions and to establish evidence of such practices. The research was therefore designed to capture empirical evidence of sustainable development initiatives at the university. The study employed systems thinking (Banathy 1992) as a guiding framework in collecting and analysing data. Based on the concept of holism, all the operational divisions and units of the university which among other things are implementing or are expected to implement sustainable development practices were represented in the study. Teaching departments were stratified according to their faculties and at least one department was selected from each of the university's seven faculties for inclusion in the study. Non-teaching divisions included in the study are: Operations/Physical Planning, the University Planning Centre (UPC), the Student Representative Council and environmental groups.

There are a few other divisions which were involved in the study but were not exposed to USAT assessment as they provide support to other units, particularly, teaching departments, for example the Centre for Community Service and UNISWA Research Centre. Their involvement in sustainability practices was already reflected through the operations of these other units.

Involved HODs at UNISWA did a self-assessment of their divisions. Results of the sustainability assessment were captured using Microsoft Excel and radar diagrams were constructed for each of the departments to give a snapshot view of the level of mainstreaming of different sustainability practices. While data from other data gathering techniques will not be discussed in this chapter, it is necessary to mention that interviews and document reviews were undertaken to supplement USAT data.

The tool enabled the establishment of the level of integration of the practices defined through USAT indicators in the different departments and divisions of the university. To give an example from Part A of the tool, integration of sustainability in the activities of the Department of Consumer Sciences was found to be very low. There is little sustainability content in the curriculum and there were no research initiatives in sustainable development (see data table in Appendix A.2 (column 4) and Fig. 1a). There were also no sustainable development partnerships between the department and other universities and/or other stakeholders. Most of the indicators were rated 1 (a little) and the average indicator score was also 1. However, there was a high level of willingness among staff to participate in sustainability (a rating of 3: substantial) even though expertise in the discipline was low (rating of 1) (Fig. 1a).

In university physical operations, most of the practices identified by the USAT (Part B) were not yet taking place at UNISWA except (Fig. 1b, raw data in Appendix 2B). These included waste reduction practices, recycling of solid waste, CO_2 and air pollution reduction practices, sustainable landscaping, etc. Most of the practices were still not quite developed and were rated 1 (a little).

A number of student initiatives for sustainable development were established to be in place from USAT Part C assessment. The extent of implementation of most of them was indicated to be a little (rated 1) during the sustainability assessment.

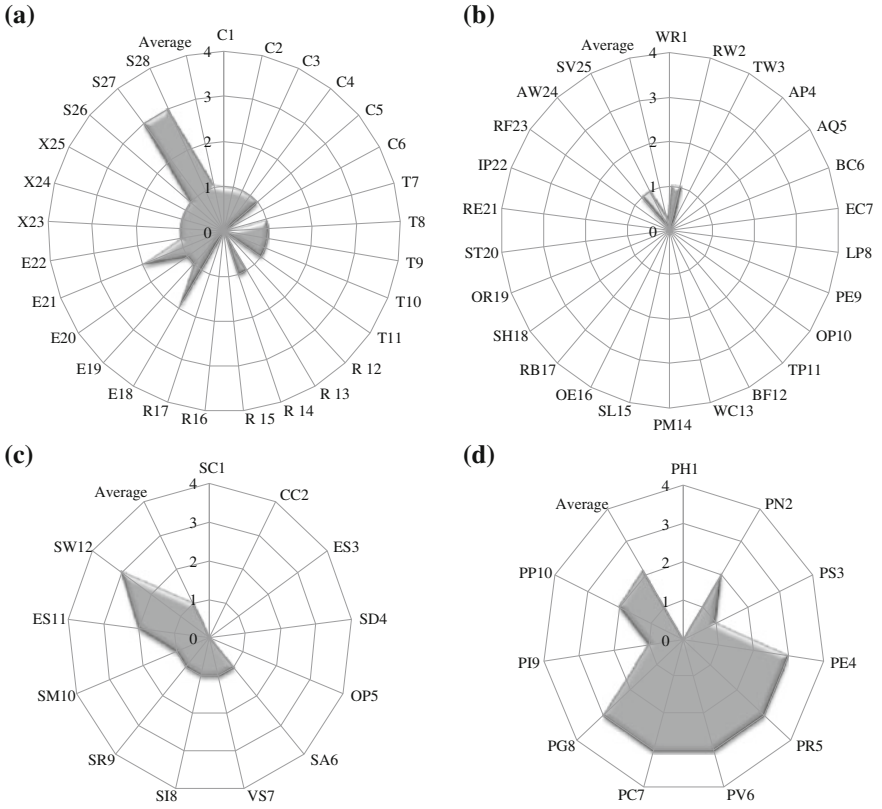

Fig. 1 A pictorial representation of USAT (Part a–d) results. **a** Department of consumer sciences **b** university physical operation **c** student activites **d** policies and written statements

Those which were rated 0 (none) were mainly practices implemented by the university for the benefit of students (see Fig. 1c and Appendix C.2). These included: career counseling; sustainability practices in residences (e.g., recycling); and orientation program(s) on sustainability for students. USAT data also revealed that the students themselves were willing to get involved in environment and sustainability issues (rated 2–adequate) and had initiated most of the sustainability practices they were involved in independent of university structures.

For Part D of the USAT, all sustainable development practices identified by the indicators are being implemented at the university, except mainstreaming of sustainability in the country's higher education (which was rated 0–none). The extent of involvement in the practices, however, differ with the scores ranging from 1 (a little) to 3 (substantial) (see Fig 1d and Appendix D.2). Generally, the results show that sustainable development is to an extent, reflected in UNISWA's written statements.

The radar diagrams provide a pictorial view of how the departments/divisions are performing in mainstreaming sustainability. For departments/universities

wanting to improve their sustainability practices, this information helps to point out areas for further improvement. The diagrams are also useful in benchmarking progress especially when departments want to engage in continuous assessment of progress. Areas of progress and those lagging behind are easily identifiable from comparing sets of data from different time periods.

Beyond an individual department, USAT data can also be used for comparative purposes. USAT Part A data can be used to compare the level of integration of sustainability among different departments within one university. The Department of Geography, Environmental Sciences and Planning (Department of Geography) at UNISWA, for example, unlike in Consumer Sciences, is highly involved in sustainable development practices defined through USAT indicators. A comparison of the radar diagrams for the two departments will quickly reveal these differences (Fig. 2). For Parts B to D, this comparison is also possible where assessment will have been done, say at faculty level.

The USAT enables the building of a whole picture from assessments done in a number of departments with similar operations, e.g., teaching departments. This whole picture can be built in two ways: to reflect overall performance per department, or overall performance per each of the sustainability indicators. Figure 3 shows overall university performance per department represented using a histogram (Fig. 3a) and a radar diagram (Fig. 3b). From 28 indicators in USAT Part A, the highest possible score for each department is 112. Overall performance for each department was obtained by totalising all indicator scores for each department and presenting them out of 112. The histogram, though reflecting overall performance per department, also shows the rating for each indicator.

Overall performance for all parts of the USAT can also be shown at university level for each indicator. At UNISWA, it is only in teaching departments that

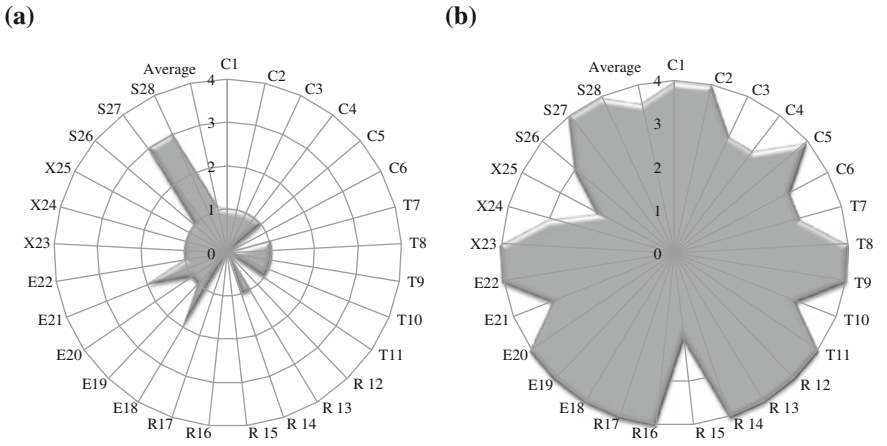

Fig. 2 A comparison of USAT assessment results for the department of consumer sciences (**a**) *versus* the Department of Geography (**b**)

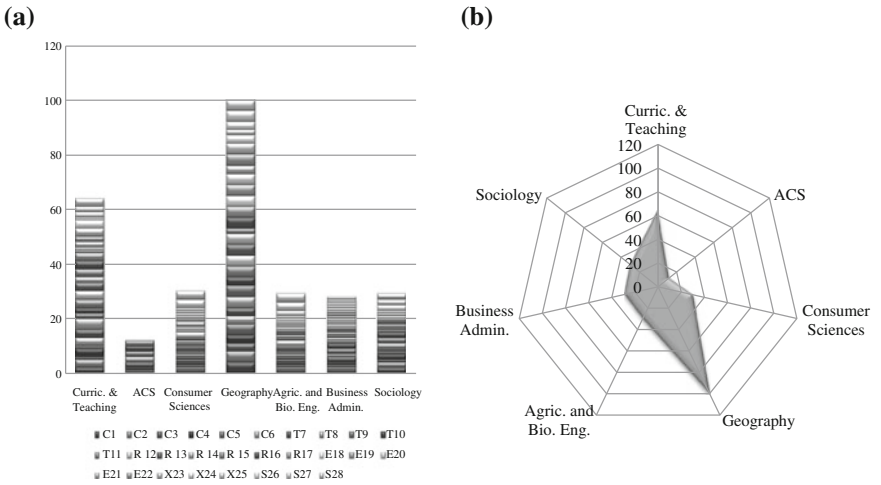

Fig. 3 Overall university performance per department. **a** A histogram showing total performance per department **b** a radar diagram showing total performance per department

multiple assessments were done. Each indicator (USAT Part A) was rated seven times (in the seven teaching departments that participated in the assessment). The highest possible rating for each indicator is four. The highest possible score for each indicator across departments is therefore 28. Figure 4 shows overall performance, out of 28, for each indicator.

Calculating overall performance, whether per department or per indicator; helps in strategic planning for universities involved in mainstreaming sustainable development. Performance per department will clearly show which departments

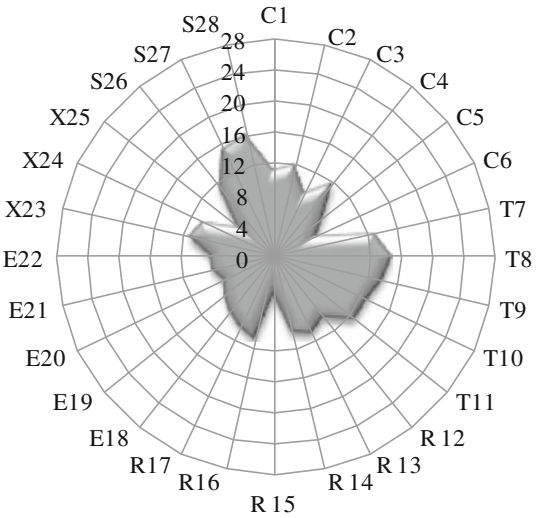

Fig. 4 Overall performance of the university per indicator

are lagging behind in mainstreaming sustainability and which ones are performing better. Performance per indicator also shows the level of involvement of the university in various practices, making clear those practices (defined by indicators) which are lagging behind. For universities wanting to strengthen their mainstreaming activities, this helps in identifying intervention areas.

Parts B to D of the USAT also help to collect qualitative data to explain the sustainability practices at the university (Part C) or to give those involved in the assessment a chance to present what they think can be done to improve the situation (Part B and D). This helps reviewers to start to reflect on their practices and to think about ways of improving them thus facilitating progressive thinking. However, in terms of evidence for the practices, not much can be gathered through the assessment.

Using the USAT to Identify Change Projects

The main aim for developing the USAT was to inform the MESA Universities Partnership as mentioned earlier, by providing a tool that would facilitate identification of change projects by participating members in their institutions. After its refinement and publication, the tool is continuously being used in the MESA Universities Partnership by staff development participants to identify change projects. Table 1 summarizes how it was used in some of the participating universities in 2011.

The USAT has proven to be a useful tool in the MESA Universities Partnership. The initiatives outlined in Table 1 show the influence the tool is having in sustainability mainstreaming in Africa but are only a few examples of how it is being used. The sustainability auditing process using the USAT is said to be enabling situating change projects in a wider context and allowing participants "to conceptualize possible change, and to see how ESD can be strengthened in the institution; and it provides them with 'data' that can be discussed in relation to practices in the institution" (Lotz-Sisitka and Hlengwa 2011, p. 16).

USAT assessments have revealed the need for curriculum reviews in many universities, including some of those outlined in Table 1 (e.g., in the University of Botswana and the university of Gondar, Ethiopia). USAT assessments have also influenced the development of new academic courses (see Buisitema University and Makerere University, Table 1). In some cases, the need for developing new academic programs was also revealed. For example, in 2008, a USAT assessment at the University of Botswana (not in the table) led to the introduction of a Masters Degree in Environmental and Sustainability Education (Togo 2009). At NMMU (Table 1) Part C (students' involvement) of the tool was adapted and used to assess sustainability among the student body. Following the assessment, the university has since recognized the need for some of the facilities that are defined as important through USAT Part C indicators. The university is also employing the

Table 1 Identifying change projects using the USAT

University	The change project and how it was informed by the USAT
Botswana: University of Botswana	*Integration of ESD into Faculty of Education Modules in Early Childhood Education (ECD) and Education Leadership and Management (ELM) programs* USAT auditing of courses was done and it informed a curriculum revision in two modules: Early Childhood Development (ECD) and Education Leadership and Management (ELM) to strengthen ESD focus
Ethiopia: Gondar University (GU) (Faculty of Health Sciences)	*Development of University Guidelines for Integrating ESD into University Curricula* A USAT assessment was done in 5 faculties. The results showed the need for curriculum re-orientation. A draft document on Guidelines for Integrating ESD into University Curricula was produced. The university is preparing itself for large scale curriculum re-orientation under a modular system, and the ESD guidelines will be used in this context
South Africa: Nelson Mandela Metropolitan University (NMMU) (Sustainability Unit)	*NMMU Student Mobilisation Project* Part C of the USAT was adapted and used to assess involvement of students in sustainability practices. The USAT results were used as foundation for the project which resulted in various initiatives and actions including the registration of a student organization, a Student Mobilization Indaba, and an Agent of Change leadership capacity development workshop. The USAT is being used for ongoing evaluation and there is evidence of substantive improvement in the project with time. Three new priorities for the university were also identified through USAT assessment that is: establishing an environmental centre for student activities; sustainability practices in residences and career counseling for work opportunities related to Environment and Sustainability
Uganda: Buisitema University (BU)	*Focus on curriculum development and teaching practices infused with SD in the Science Education faculty* USAT analysis showed low levels of integration of sustainability into university programs, and a lack of community engagement. This led to the development of a cross cutting course for the Bachelor of Science Education programme which was due to begin in August 2012

(continued)

Table 1 (continued)

University	The change project and how it was informed by the USAT
Uganda: Makerere University (MU)	*Integration of SD into the 'Theory and Practice of Educational Administration' and Management course outlines* The USAT audit of different sub-disciplines in the School of Education showed poor integration of ESD concepts and approaches in all courses. Integration of ESD is being done in one of the courses. A draft of the course outline with revisions to mainstream ESD has already been produced. Later, internal discussion of the USAT audit results showed that there is a desire by staff to gain a deeper understanding and skills in sustainable development in the School of Education as a whole. It was proposed that an effective way to deal with this would be to design a Postgraduate diploma and Masters Degree course in ESD in the School of Education; to develop short courses on ESD; and to enhance community engagement

Source Adapted from Lotz-Sisitka and Hlengwa 2011

tool to continuously assess progress with time, showing the usefulness of the tool in benchmarking progress.

While in many cases, like in the examples captured in Table 1, only one part of the USAT was employed in assessing sustainability for purposes of identifying change projects, some universities used all the four parts of the tool. Besides the UNISWA example discussed in this chapter, Mansoura University in Egypt (not in the Table) also performed a whole university assessment. It is also one of the universities that used Part B–D of the tool at faculty level before building a whole university picture from the assessments (Mostafa 2011). This also serves to show the flexibility in the way the tool can be employed. Most important is its potential to 'seed change' in universities toward sustainability within an emergent and reflexive social change approach (Lotz-Sisitka and Hlengwa 2011).

Concluding Remarks

Data from USAT assessment only show the level of integration of sustainability (for the identified indicators) in university functions. The data does not provide any form of evidence for the practices except Part C, which require respondents to explain the sustainability activities on the ground. At the same time, it does not show how mainstreaming has been happening in an institution. From the

assessment that was done at Rhodes University, it was therefore found necessary to supplement data from the sustainability assessment with other data collection techniques. These include interviews to get a fuller explanation of the practices particularly for Parts A, B, and D, analysis of documents with evidence of such practices which also help to show if sustainable development is being addressed holistically (i.e., whether all sustainable development dimensions; ecological, social and economic; are addressed). Examples of relevant documents include course material, examination scripts, research reports; community service reports student magazines, minutes of meetings and even content from the university website. Observations of practices can also substantiate data from other sources.

The USAT has had considerable influence in sustainability mainstreaming practices in the MESA Universities Partnership. This shows that the tool is relevant to the African context, even though in some cases the indicators had to be adapted to suit local circumstances. Because of its in-built flexibility, it was used in various ways with many of the universities employing only one out of its four parts. The main value of the USAT lies in its demonstrated potential to reveal the level of integration of sustainability in university operations and enabling identification of starting points for change oriented learning and action projects for the incorporation of sustainability in universities.

Appendix The USAT

USAT Part A: Teaching Departments

PART A Unit-Based Sustainability Assessment Tool Teaching, Research and Community Service

Institutions/departments committed to sustainability feature certain topics in their course offerings, e.g., globalization and sustainable development; environmental philosophy; nature writing; land ethics and sustainable agriculture; health promotion, urban ecology and social justice; population, intercultural understanding and peace, women and development; human rights, overcoming poverty, sustainable production and consumption; the role of information and communication technologies and many others (ULSF 1999). Sustainability would be integrated into faculty and student research on topics such as renewable energy, sustainable building design, ecological economics, indigenous wisdom and technologies, population and development, total environmental quality management, etc. (ibid.) The USAT is designed to assist in assessing the extent to which your department is engaging in sustainable development concerns in its teaching, research, and

outreach activities. It requires you to give your impression on the identified dimensions using the assessment criteria below.

Assessment criteria	
X = Don't know	no information concerning the practice
0 = None	there is total lack of evidence on the indicator
1 = A little	evidence show poor performance
2 = Adequate	evidence show regular performance
3 = Substantial	evidence show good performance
4 = A great deal	excellent performance

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 enroll students in courses that engage sustainability concerns						
C6	The level of cross faculty collaboration in teaching sustainability programs						
	Teaching approach How far the teaching approach contributes to development of the following characteristics among students:						
T7	The capacity to make informed decisions						
T8	Critical thinking skills						
T9	A sense of responsibility						

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Code	Indicator	Score					
		x Don't know	0 None	1 A little	2 Adequate	3 Substantial	4 A great deal
T10	Respect for the opinions of others						
T11	Integrated problem solving skills						
	Research and scholarship activities						
R12	The extent to which the department (staff and students) is involved in research and scholarship in the area of sustainability						
R13	The degree to which global sustainability issues and challenges form part of the department's research						
R14	The degree to which local sustainability issues and challenges form part of the department's research						
R15	The extent to which the department is collaborating with other faculties, institutions, and stakeholders in pursuit of solutions to sustainability problems						
R16	The extent to which aspects of sustainable development are used in selection/execution of research						
R17	The level to which aspects of sustainable development are reflected in the department's research outputs						
	Community Engagement						
E18	The extent to which the department (staff and students) is involved in community engagement in the area of sustainability						
E19	The level of commitment of the department's resources in sustainability projects in the community						
E20	The degree to which local sustainability issues and challenges form part of the department's community engagement						
E21							

(continued)

	The extent to which the department collaborates with other stakeholders in addressing community sustainability challenges
E22	The extent to which aspects of sustainable development are used in selection/execution of community engagement projects
	Examination (assessment) of sustainability topics
X23	The extent to which sustainability aspects are assessed/examined during course
X24	The extent to which sustainability aspects are considered in evaluating/assessing projects
X25	The degree to which sustainability aspects are assessed in evaluating service learning programs
	Staff expertise and willingness to participate
S26	The level of expertise of staff members in the area of sustainability
S27	The extent to which staff members are willing to carry out research and service activities on sustainability aspects/topics
S28	The extent to which staff members are willing to teach sustainability topics
	Others (please specify):

USAT Part B: Operations and Management

PART B Unit-Based Sustainability Assessment Tool Operations and Management

Institutions committed to sustainability often emphasize some of the operational practices listed below (adapted from ULSF 1999). The USAT helps to assess the extent to which an institution has implemented these practices using the assessment criteria below. Please complete the score sheet, Add a tick ($\surd$) for key project areas and where more information is needed, leave blank where the practices are non-existent. Briefly indicate what you think can be done, what can be done to improve the sustainability of the practice.

Assessment criteria	
X = Don't know	no information concerning the practice
0 = None	there is total lack of evidence on the indicator
1 = A little	evidence show poor performance
2 = Adequate	evidence show regular performance
3 = Substantial	evidence show good performance
4 = A great deal	excellent performance

Code	Practices	Rate	Key area	Inadequate info	What can be done to improve the sustainability of the practice?
WR1	Waste reduction practices				
RW2	Recycling of solid waste (including paper, plastic, metal, etc.)				
TW3	Source reduction of toxic materials and radioactive waste				
AP4	CO_2 and air pollution reduction practices (including alternative fuel use, renewable energy sources, emission control devices, etc.)				
AQ5	Indoor air quality standards and practices				
BC6	Building construction and renovation based on ecological design principles				
EC7	Energy conservation practices (in offices, laboratories, libraries, classrooms, and dormitories)				
LP8	Local food purchasing programme				
PE9	Purchasing from environmentally and socially responsible companies (including buying and using 100 % post consumer chlorine free paper)				
OP10	Organic food purchasing programme				
TP11	Transportation programme (including bicycle/pedestrian friendly systems, car pools, bus pass programs, electric/natural gas campus vehicles)				
BF12	Use of bio-fuel				
WC13	Water conservation practices (including efficient shower heads and irrigation systems)				
PM14	Integrated Pest Management practices (including reduction of pesticides to control weeds)				

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Code	Practices	Rate	Key area	Inadequate info	What can be done to improve the sustainability of the practice?
SL15	Sustainable landscaping (emphasizing native plants, biodiversity, minimizing lawn, etc.)				
OE16	Integration of sustainability operations into the educational and scholarly activities of the university				
RB17	The presence of a body responsible for sustainable development at the institution				
SH18	Consideration of aspects of sustainability in staff hiring decisions				
OR19	Consideration of aspects of sustainable development in orientation programs for new staff members				
ST20	Staff development in sustainable development				
RE21	Staff rewards in sustainable development				
IP22	Consideration of aspects of sustainable development in institutional planning				
RF23	Allocation of research funds for sustainability projects				
AW24	Awareness raising in sustainable development				
SV25	Visibility of sustainable development through celebration of environmental days (e.g., Arbor day, water week, etc.)				
	Others (please specify):				

USAT Part C: Student's Involvement

PART C Unit-Based Sustainability Assessment Tool Student's Involvement

Institutions committed to sustainability provide students with specific opportunities and settings. They also encourage students to sustainability issues when choosing a career path. Conversely, students can initiate some of the activities, especially, if the institution is supportive. Listed below are some of the opportunities and activities for and by students (some were adapted from the ULSF 1999)

which reflect commitment to sustainability. The USAT helps in assessing the degree of involvement of students in environmental and sustainability issues using the given assessment criteria. Add a tick ($\surd$) for key areas and where more information is needed; briefly outline key activities in the area of sustainability

Assessment criteria	
X = Don't know	no information concerning the practice
0 = None	there is total lack of evidence on the indicator
1 = A little	evidence show poor performance
2 = Adequate	evidence show regular performance
3 = Substantial	evidence show good performance
4 = A great deal	excellent performance

Code	Activities and opportunities	Rate	Key areas	Inadequate info	Outline of activities (what exactly is being done?)
SC1	Student environmental centre				
CC2	Career counseling focused on work opportunities related to environment and sustainability				
ES3	Environmental societies or other Student Group(s) with an environmental or sustainability focus				
SD4	Sustainability practices in residences or dormitories by students (e.g. recycling)				
OP5	Orientation programme(s) on sustainability for students				
SA6	Student environmental and sustainability awareness programs				
VS7	Voluntary community service by students related to sustainability issues and concerns				
SI8	Involvement of student groups across campus in sustainability initiatives				
SR9	SRC involvement in environmental and sustainability initiatives				
SM10	Student collaboration with management in the area of environmental and sustainability				
ES11	Environmental and sustainability activities initiated by students themselves (independent of departments, lecturers, management, etc.)				
SW12	Students' willingness to take responsibility in the environmental and sustainability area				
	Others (please specify):				

USAT Part D: Policy and Written Statements

PART D Unit-Based Sustainability Assessment Tool Policy and Written Statements

Part D of the USAT focuses on integration of sustainability in higher education policy and the degree to which such higher education policy is shaped national and global sustainability issues. It also considers the level to which institutional policies and written statements reflect mainstream sustainability issues, and the degree to which they show commitment on the part of the university to address national and global sustainable development agendas. According to ULSF (1999), institutional commitment to sustainability can also be expressed through written statements of the mission and purpose of the institution; Rate activities and opportunities in the environmental and sustainability area by completing the score sheet. Add a tick ($\surd$) for key areas and where more information is needed; leave blank where the practices are non-existent. Briefly outline key activities in the area of sustainability.

Assessment criteria	
X = Don't know	no information concerning the practice
0 = None	there is total lack of evidence on the indicator
1 = A little	evidence show poor performance
2 = Adequate	evidence show regular performance
3 = Substantial	evidence show good performance
4 = A great deal	excellent performance

Code	Practices	Rate	Key Area	Inadequate info	Elaborate on the situation	What can be done to improve the situation
PH1	The extent to which the country's HE policy reflects an engagement with sustainability concerns					
PN2	The degree to which national and global sustainability issues inform decision-making processes in HE policy and structures					
PS3	The level of support given to HE institutions on sustainability programs					
PE4	Existence of sustainability/ sustainability related policies at the institution					

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Code	Practices	Rate	Key Area	Inadequate info	Elaborate on the situation	What can be done to improve the situation
PR5	Integration of sustainability issues in institutional policies					
PV6	Integration of aspects of sustainable development in university vision and mission statement					
PC7	Reflection of local sustainability challenges in policies and written statements					
PG8	The degree to which policies and written statements reflect national and global sustainability issues					
PI9	Implementation of policies of sustainability/sustainability related policies					
PP10	Plans to improve sustainability focus in the next policy review cycle					
	Others (specify):					

Appendix 2 USAT Data Tables

Data table for all teaching departments

Indicator	Department							
	Curriculum & Teaching	ACS[a]	Consumer Sciences	Geography	Agricultural & Biosystems Eng.	Business Administration	Sociology	Total score per indicator
C1	2	0	1	4	1	1	2	11
C2	3	0	1	4	1	1	2	12
C3	1	1	1	3	1	1	1	9
C4	3	1	1	3	1	1	2	12
C5	1	0	1	4	1	0	1	8
C6	3	0	0	3	0	0	0	6
T7	3	2	1	3	1	2	1	13
T8	4	2	1	4	1	1	2	15
T9	2	2	1	4	1	2	2	14
T10	2	2	1	3	1	2	2	13
T11	3	2	1	4	1	1	1	13

(continued)

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Indicator	Department							
	Curriculum & Teaching	ACS[a]	Consumer Sciences	Geography	Agricultural & Biosystems Eng.	Business Administration	Sociology	Total score per indicator
R 12	3	0	0	4	2	1	0	10
R 13	3	0	1	4	1	1	1	11
R 14	2	0	1	4	1	1	1	10
R 15	3	0	0	2	0	0	0	5
R16	3	0	1	4	1	1	1	11
R17	3	0	0	4	1	1	1	10
E18	0	0	2	4	1	1	1	9
E19	1	0	1	4	1	1	0	8
E20	1	0	1	4	0	1	0	7
E21	2	0	2	3	0	1	0	8
E22	2	0	1	4	0	1	0	8
X23	3	0	1	4	1	1	1	11
X24	3	0	1	3	1	1	1	10
X25	1	0	1	2	1	1	0	6
S26	2	X	1	3	2	1	2	11
S27	2	X	3	4	3	1	2	15
S28	3	X	3	4	3	1	2	16
Average	2.3	0.5	1.1	3.6	1.0	1.0	1.0	
Total (112)	64	12	30	100	29	28	29	

r* Academic Communication Skills

Data table for operations and management

Indicator	Rate
WR1	1
RW2	1
TW3	0
AP4	1
AQ5	0
BC6	0
EC7	0
LP8	0
PE9	0
OP10	0
TP11	0
BF12	0
WC13	0
PM14	0
SL15	1
OE16	0

(continued)

(continued)

Indicator	Rate
RB17	0
SH18	0
OR19	0
ST20	0
RE21	0
IP22	2
RF23	0
AW24	1
SV25	1
Average	0.32
Total (100)	8
Rating (%)	8

Data table for students' involvement

Code	Rate
SC1	
CC2	0
ES3	1
SD4	0
OP5	0
SA6	1
VS7	1
SI8	1
SR9	1
SM10	1
ES11	2
SW12	3
Average	1
Total (48)	11
Rating (%)	22.9

Data table for policy and written statements

Indicator	Rate
PH1	0
PN2	2
PS3	1
PE4	3
PR5	3
PV6	3
PC7	3
PG8	3
PI9	1
PP10	2
Average	2.1
Total (40)	21
Rating (%)	52.5

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