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# Virtual Learning Environments for Transformation to Sustainability: A Case Study from the “South”

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## Abstract

An appropriate pedagogy for supporting behavioural changes required to achieve more sustainable futures should include collaborative knowledge construction, within learning spaces allowing for critical discourse and reflection integrated with real-world applications. However, it is not easy to implement a challenge based pedagogy like this in institutions where the academic system utilises individual grading and related measures of success and with academic staff reluctant to use alternative approaches and to formulate course outcomes in terms of behavioural change. This chapter maps and critically reflects on the implementation of a sustainability focussed honours (junior post graduate, 4th level) degree, in which a transformative pedagogy is used. It is a fully online degree, offered by the Department of Geography, University of South Africa (an open and distance learning institution). Difficulties associated with collaborative learning for sustainability and the facilitation of project based research within the virtual learning environment are highlighted, and how these are addressed. These reflections include consideration of the Global South context within which Unisa functions, confronting students and staff with infrastructural issues such as access to information and communication technology, but not necessarily preventing transformational learning for sustainability.

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## **1 Introduction**

### **1.1 Transforming to Sustainability in Higher Education**

The theme addressed in this chapter concerns the type of teaching and learning conducive to and assisting students in adapting behaviours towards increased sustainability. The sustainability issues faced by the world involve so-called ‘wicked problems’ since they threaten the continuation of life, are urgent to attend to, embedded in uncertainty and associated with long-term impacts with no clear-cut solutions (Brundiers and Wiek 2013). Students cannot be prepared effectively to deal with these challenges in educational settings over-focussing on knowledge (Sarewitz et al. 2012) and/or prematurely consider solutions but without theoretical depth (Jerneck et al. 2011). As a result there is growing interest in transformative learning (TL) to achieve the required depth of learning to equip students to contribute meaningfully to address sustainability challenges (Blake et al. 2013). TL implies reflexive practice in action, i.e. learning involving deeper levels of knowing and meaning, thinking critically about what we do and why, and consequently implementing change and acting differently (Sterling 2011).

### **1.2 E-Learning for Transformation to Sustainability: The Global South Context**

This chapter situates education for sustainable development (ESD) and the need for innovative practices such as TL, within the Global South and specifically Southern Africa. Despite the ESD agenda being embraced in many parts of the world, this is not necessarily the case in the Global South, including Africa, where initial enthusiasm dissipated with realisation that commitments need to be supported by multi-level actions (Manteaw 2012). In addition, the need for access to higher education is much greater in the Global South than elsewhere (McNaught 2005). This includes the need for access to ESD, described by Manteaw (2012) as lacking visibility in Africa. By implementing e-learning, open and distance learning (ODL) institutions have the ability to respond to this need. But they are limited in their ability to do so in the Global South due to amongst other things infrastructural constraints (Wright et al. 2009). This limits the access of students to information and communication technologies (ICT’s), as indicated by Oyedemi (2012) for the South African context.

### **1.3 Context: ODL, Unisa and the Department of Geography**

In terms of its size of more than 300,000 students in 2012 (Unisa 2012), experience and capacity as significant ODL provider (Tait 2008), Unisa is well positioned to contribute towards ESD (Unisa 2005). Although sustainability is embedded in the Unisa vision (Unisa 2007), a common perception is that ODL is better suited to a transmissive type of pedagogy (Barasa 2011), compared to TL and epistemic learning (encouraging critical questioning of assumptions, beliefs and values), and which are better suited to ESD (Sterling 2011). On a positive note, the constant review of pedagogical approaches at Unisa needs to be mentioned, with aim to address these criticisms. ESD at Unisa is hindered by the institutional structure of Departments, Schools and Colleges, which presents difficulties for collaboration and multi-inter-trans-disciplinary initiatives. Despite this, the Department of Geography managed to implement an undergraduate degree in environmental management in 2000, which has since developed into a flagship degree at Unisa.

### **1.4 Aim, Methodology and Value of Chapter**

This chapter aims to take a reflexive position on the implementation of the re-curriculated Honours in Geography at Unisa during the 2013 academic year, in terms of contributing to the transformation towards sustainability. As a fully online degree, this includes consideration of the virtual learning environment (VLE) in facilitating a transformative sustainability learning experience. This chapter has been compiled from the reflective narratives by the development and teaching team of this degree and presents their pooled experience of the implementation and extent to which sustainability aims have been achieved. The value of this type of enquiry is to provide richer descriptions of contextual nuances than for traditional analytic research (McNaught 2005). The curriculum of the qualification and its facilitation through the VLE is firstly reviewed. This is followed by reflective narratives on the collaborative and project based research components of the qualification. The conclusion reflects on the extent to which the aim of transformation towards sustainability has been achieved, with reference to the Global South and teaching and learning through the online mode.

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## **2 A Sustainability Focused Curriculum: The Honours in Geography at Unisa**

### **2.1 The Sustainability Connection**

Aligned to the discourse on ESD in higher education (Hopkinson et al. 2008), ‘environment’ and ‘sustainable development’ have been features of the curriculum of all modules offered by the Department of Geography (Unisa) for a number of

years. Sustainable development is understood as the process enabling humanity to achieve an environmental, social, economic and cultural sustainable world. Recently, the Department of Geography moved from teaching ‘about’ sustainability to teaching ‘for’ sustainability (Pretorius et al. 2014) to produce graduates that could deal with the sustainability issues faced in the Global South. This shift aims to increase the graduateness, employability and citizenship of Geography graduates at Unisa.

## 2.2 Reasoning Underpinning the Curriculum

The Honours in Geography is a postgraduate qualification aiming to prepare students for research-based study in Geography. In South Africa this qualification follows on a Bachelor’s Degree, and serves to deepen expertise in Geography and to develop capacity in the methodology and techniques of Geography. This qualification demands a high level of theoretical engagement and intellectual independence (Council of Higher Education 2013) and its development was premised on external and internal pressures to deliver graduates sensitive to a variety of environmental and societal issues in the Global South.

The consensus in the development team was that this qualification should focus on the ability of graduates to identify and solve geographical problems, with emphasis on problems with no specific ‘right solutions’ (Johnston 1997). Graduates have to be able to identify, analyse and deal with real-world problems through theory-driven arguments to suggest evidence-based solutions. Students therefore need to work through a range of research methods and techniques and develop ability to select those relevant to their specific research problems. This is aligned with the requirement of the Council of Higher Education (2013) that at least 25 % of honours degrees must include research.

## 2.3 Curriculum Components

This qualification consists of five compulsory modules (Table 1). Three of the modules focus on themes to address discourses underlying a variety of social and environmental challenges in the Global South. The fourth module allows students to identify a real-world research problem within the discipline of Geography, while the final module is about the actual research to explore this real-world problem and provide perspectives on possible solutions. Each of the modules relate to the perspective that the discipline of Geography is characterized by change and diversity, with a wide range of philosophical approaches blended around three interrelated concepts of space, place and environment.

**Table 1** Curriculum for the Bachelor of Science Honours in Geography, University of South Africa

Module title	Purpose
Geography of people-resource interactions in the Global South	Guides students in developing a voices on issues related to interactions between people and resource use in the Global South
Geographic perspectives of environmental change	Develops capacity of students to deal with environmental change with reference to interrelationships of natural and anthropogenically-induced phenomena
Geography of everyday living in human settlements	Guides students to explore factors impacting on quality of life and everyday living in human settlements
Geography in action: from problem identification to methodology	Develops ability of students to identify a real-world geographical scenario justifying research and to prepare a research proposal
The geographer as a researcher	Guides students to undertake research on their chosen geographical scenario, and to report on research findings

## 2.4 Transformative Elements

Underlying the teaching and learning of the modules is provisioning of a variety of real-world problems in the Global South. Students are encouraged to make own interpretations on subject matter, rather than act on beliefs, judgments and perceptions of others. The overall purpose is for students to develop autonomous thinking on sustainability, thereby producing graduates who can act as moral citizens in situations of change. Online delivery supports the fundamental principles of ESD. In addition, this mode of teaching and learning provides students with current information and case studies, allowing them to become better citizens in the Global South. However, the VLE presents challenges for students and staff, especially in the context of the Global South.

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## 3 The VLE for the Honours in Geography

### 3.1 Implications of Using a VLE

The Honours in Geography was re-curriculated with e-learning in mind. Based on information and communication technologies (ICT's), e-learning can take various forms (Lynch et al. 2008). This qualification was designed to be fully online, implying a shift from 'physical to virtual campuses' (OECD 2005). In the Unisa context, this is not a shift away from a physical campus, but rather from a distance learning to an online (virtual) environment and from paper based to electronic delivery. Online implementation was integrated with re-curriculation. The modules

could be developed with consideration of the tools available in the VLE. This is in contrast with Unisa practice till recently, with students receiving all study material for a specific module upon registration.

### **3.2 Elements of the VLE for this Qualification**

Online delivery and VLE's are diverse and often designed for particular courses, degrees or even disciplines. Thus it is essential to define the elements of the VLE for the Honours in Geography, which is based on a version of the Sakai collaboration and learning environment. It is an asynchronous platform, not requiring real-time interaction and includes a course content tool, a discussion tool, a blog tool, a wiki page and a file-sharing tool. While other applications of VLE's might apply creative and authentic scenarios, as Mundkur and Ellickson (2012), the tools for the Honours in Geography are straightforward. Students do not receive any printed study material, but have to access it via the course content and file-sharing tools. The course content tool guides students to explore general resources, however, most guidance to search for resources is provided in a module specific way.

### **3.3 The VLE and Transforming to Sustainability**

The process of finding appropriate resources is crucial for student's transformative learning journey. This is something that very few students have done before, especially in terms of the legacy at Unisa of providing complete study packages up front. While some readings are recommended for individual modules, the qualification demands students to engage with various source materials to gain theoretical depth. Students therefore have to take initiative and responsibility to find relevant source material. This requires continual interaction and guidance to structure a process that students experience as arbitrary, something that would not be possible in the rigid structure associated with pre-prepared learning materials.

The VLE plays a significant role in guiding students and supporting transformative learning and enables creation of learning experiences to engage students in problems and paradigms rather than simply delivering content. For the Honours in Geography, guided discussion forums and blogs entice students not only to reflect on their frames of reference, but to learn about the viewpoints of others and be exposed to new frames of reference. This needs to be done in a collaborative environment where continual interaction supports transformation. VLE's are particularly well suited for this since they allow sharing of underlying theory, interactive collaboration and facilitation of problem-based learning. Problem-based learning (associated with Geography) is essential for transforming towards sustainability.

### **3.4 The VLE in the Global South**

Learning experiences in this qualification are shaped by location specifics of students in the Global South. Even if disregarding disparities and digital inequalities, it is a fact that almost 63 % of students in South Africa are without Internet access at home (Oyedemi 2012). Although Oyedemi (2012) provides information on access to computers and Internet penetration, this is not necessarily a good indicator of ICT literacy. The experience gained with the Honours in Geography in 2013 showed that ICT literacy, as opposed to access, often deteriorated learning experiences. Problems with using the VLE (lack of access, poor ICT literacy and occasional downtime of the VLE) affect the online learning experience and hamper transformational learning, which relies heavily on collaboration and interaction through the VLE tools.

For this qualification, using appropriate tools, technologies and methods formed an integral part of course design. It was therefore critical to consider the needs of users during implementation (Wright et al. 2009). In the Global South, with issues concerning access and ICT literacy, the straightforward tools of the utilised VLE are well suited, as they are not data intensive and require minimal bandwidth. Furthermore, working asynchronously meets the needs of the majority users, with many relying on cellular or 3G mobile connections for Internet access (Oyedemi 2012). Implementation of this qualification illustrates that careful course design, cognizant of the capabilities and limitations of the rigid VLE, can support the collaborative and reflexive learning required for ESD.

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## **4 The Role of Collaborative Work in the Honours in Geography**

The reflection provided in this section focuses on the experience gained in the three thematically orientated modules (Table 1) of the Honours in Geography during the 2013 academic year.

### **4.1 Collaborative Work and Transforming to Sustainability in the Global South**

Sustainability goals are reflected in the purpose statement and outcomes for each of the thematic modules in this qualification (Table 1). The sustainability discourse is the golden thread through these modules, while the Global South context is firmly established, especially in the module on people-resource interactions. Learning experiences are linked to real-world challenges in communities where students are from. The expectation is that local wisdom and experiences from different communities have to be incorporated in learning experiences, referred to by Manteaw (2012) as SCOLE (school-community learning exchange). In this way different

cultural, social and ecological experiences feed into discussions as well as student's own ideas and value systems.

The tools provided in 2013 in the VLE facilitated various forms of lecturer-student and student-peer collaboration, thus supporting the transformation to sustainability (Lynch et al. 2008). This included "student lounge" forums, where students could introduce themselves, share information on professional/personal interests and discuss matters related to their studies. Despite the diverse and geographically dispersed student population, the VLE assisted in creation of a virtual student community. This is in line with the stages of student-peer interaction in e-learning (Siemens 2011), namely communication, collaboration, cooperation and community and supports the importance of socialization taking place before collaborative tasks for co-construction of knowledge.

## **4.2 Elements of Collaborative Work in the Three Thematic Modules**

The people-resources module required students to apply theory to a region of their choice, identify issues in this region and suggest solutions. Each of the five focus areas of this module included participation in graded discussions or a wiki and reflective blogging. Several challenges manifested during this collaboration. Although participation in discussions was good, posts focused on the initial guiding quote, with little reaction to other posts. As different regions were selected, reflective blogs could have supported collaboration. But many students did not blog, with even fewer commenting on blogs by peers. The wiki was used to collaboratively compile a reference list, a sustainability glossary and guidelines for comparative studies. The challenge with the wiki seemed to be inability to use it. For various reasons, collaborative learning in this module was not totally embraced. However, students who indeed collaborated, obtained good final results.

In the environmental change module, changes in the physical environment were considered, together with risks and vulnerabilities for affected communities. Towards the goal of transformative learning, students were required to formulate their world view on environmental change and to reflect on it by means of comparisons with YouTube videos linked to the module site. This reflection had to be shared through a blog, with students commenting on each other's blogs. Various case studies were used to compare the impact of environmental change in different contexts such as the North and South, with an opportunity for collaborative learning in discussion forums. Credits were allocated to students for participating in some of these discussions, while other discussions were for formative purposes only. Some individual assignments consisted of a collaborative component, in which case the history of the wiki tool was used to allocate marks.

The design of the human settlements module involved contextual application of the geographical perspective, different discourses on quality of life in human settlements, performing authentic tasks on quality of life in human settlements and



communicating feedback to interested/affected parties. The sustainability discourse and the Global South were considered for selecting reading material. Human settlements were explored in rural, urban and informal contexts using photographs, Google Earth and direct observations. Each of the learning units supplied opportunity for collaboration via discussion forums. For example, after observing and comparing neighbourhoods in terms of predetermined questions, students could share and discuss own experiences. Concluding each learning unit, reflective blogging was required. The wiki was used for creating a common product about using tools to evaluate quality of life, but unfortunately proved not to be very successful.

### **4.3 Pros and Cons of Collaborative Work with Reference to the Global South**

Many of the challenges experienced with collaboration during 2013 with the three thematic modules are not unique to online learning, but generally characteristic of group work. Before commencing with their studies, students need to understand reasons for and benefits of collaborative learning and get to know the VLE. In 2013 different attitudes about collaborative learning were experienced. Some students were apathetic, while others were not keen to collaborate at all. Possible reasons could be individual unease of students after accidentally deleting work of peers or by posting in incorrect places, or having to repeat activities as they did not save their work. The lacking computer skills of the typical student could also be a de-motivation and barrier to e-learning. Collaborative work such as creating documents online was problematic as limitations experienced by some of the students, had an impact on the group as a whole.

Collaboration was more successful where clear structure and specific instructions were provided. An example from the people-resources module was using the wiki to create a sustainability glossary. The wiki listed the concepts, with each student assigned a concept to define. In the human settlements module, students had to identify tools to investigate quality of life as part of group work, but it might have been better to provide a list of tools on which can be commented in a structured way. A functional use of the wiki in the people-resources module was to provide a space for students to comment and ask questions while the lecturer reflects on marking of assignments. Further research is required on challenges of collaborative learning through the VLE at Unisa. This also refers to the required balance between individual initiative and collaborative learning to find solutions to Global South challenges and provide inputs for transforming to sustainability.

## **5 The Role of Project Based Research in the Honours in Geography**

### **5.1 Project Based Research and the Sustainability Connection**

Markham (2011) describes project-based learning (PBL) as the integration of knowing and doing. This type of learning pre-supposes that students will obtain knowledge within a core curriculum, and then be able to apply what they know from a combination of their present and previous formal training together with their life-worlds to attempt to solve authentic problems in a meaningful manner. PBL allows space for interdisciplinary, collaborative, experiential as well as transformative learning and within the VLE it can be used to facilitate inquiry, dialogue and reflection on various facets of sustainability (Thomas 2000).

### **5.2 Elements of Project Based Research in This Qualification**

During the development stage of the Honours in Geography, the team shifted the curriculum focus towards the values of sustainability. The fact that students in this qualification come from a wide range of backgrounds with diverse interests, was used to incorporate collaborative learning within a system of PBL, thus allowing students to share the triple bottom line of sustainability (social, economic and environmental) from the perspective of the key interrelated concepts of Geography (space, place and environment).

The research proposal and project modules involve inquiry, knowledge building and progress towards resolution. This implies transformation and construction of knowledge, which is facilitated through student driven research activities. Students are guided to apply the perspectives and knowledge gained from the thematic modules in the context of real-world scenarios (Thomas 2000). Together with acquired knowledge and skills supportive to do research, students then proceed to identify a problem or issue for investigation and then embark in the research about it. The research proposal and project modules thus attempt to embrace transformative, experiential, and collaborative learning through the creation of a space in the VLE where various perspectives on geographical problems are presented in a way supportive of student driven research.

In the research project module, students are engaged in inquiry through application of the geographical perspective of space, place and environment. Within this perspective students are then required to identify problems/challenges. In order to address these problems/challenges, they have to develop a problem statement, seek further information on the topic, decide on a methodology to address the problem, collect relevant data, analyse the data and draw conclusions. Finally students are expected to communicate their findings, ideas and recommendations as an academic

paper. Not only does the VLE allow for PBL in an authentic context, it also allows for collaborative learning and sharing between students and peers as well as between supervisors and students.

### **5.3 Project Based Research and Transforming to Sustainability**

Reflecting on the experience with the research proposal module during the 2013 academic year, the problems initially selected by students were very generic, although related to sustainability issues in the Global South. The majority of identified problems required to be narrowed down to enable viable research. Most students participated in providing comments on the problems selected by their peers, which enabled them to narrow down the problems significantly. This activity was successful in terms of the number of comments submitted. In addition the comments indicated a high level of understanding of sustainability issues. As the process unfolded, it became clear that many students battled with contextualising their chosen problems within the discipline of Geography. It therefore became the task of the allocated supervisors to ensure the relevance of the selected research problem in this regard. To an extent this inhibited the student-driven research approach, as supervisors had to intervene and provide input at certain stages. To complete the research proposal module successfully, supervisor-student and student-peer collaboration through sharing and reflection via the electronic forums was critical. Eventually the majority of students were able to meet the minimum requirements and presented an acceptable research proposal.

The research project module followed a similar approach, but more individual supervisor-student and less student-peer interaction occurred. The student's research projects covered a range of real-world problems related to sustainability and improving quality of life in their selected local contexts, mostly in the Global South. The students were expected to present their research as a scientific article or report. In this module a variety of online activities via discussion forums and blogs were included to encourage supervisor-student and student-peer discourse to assist students in undertaking their research, but low participation rates occurred. Due to limited interaction between students, supervisors had to interact more intensely, thereby losing out on the value of student-peer interaction. The majority of students did not make efficient use of the collaborative or reflective opportunities throughout the study period. The low rate of participation in the reflective online activities as well as the lowered student-peer collaboration could be attributed to the fact that the research project is still based on individual grading. Despite the lack of collaboration between student and peers in the research project module, many students were able to submit acceptable work and achieved the outcomes of the module.

## 5.4 Pros Versus Cons of Project Based Research, with Reference to the Global South

The research proposal and project modules within the Honours in Geography were accompanied with challenges as well as opportunities for both students and supervisors during the 2013 academic year. The modules succeeded in contributing to the development of a VLE characterised by inquiry, dialogue and reflection on various facets of sustainability and placed PBL at the forefront. A student driven approach was encouraged, however, in the research project module lower participation rates reduced the advantages of PBL and collaborative learning. The collaborative facets were not fully embraced by all and therefore need to be placed at the forefront of all research proposals and projects in future. The technological realities related to access to the Internet and computer literacy need to be recognised and emphasised as this remains a huge challenge for both students and supervisors.

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## 6 Concluding Remarks

Program review is an important process that should be well planned and executed with professional integrity in order to improve all educational offerings. It contributes to the overall quality of service to students, the reputation of Unisa as an ODL provider, and demonstrates the commitment of Unisa to professional accountability in offering quality educational programmes. An important first step of a review process is the opportunity provided to the academics involved in the design, development and teaching of the programme to share their personal experiences and reflections. These reflections can then contribute to the framing of problems and focus areas for further improvement.

In this chapter it may have become clear that designing and developing the Honours in Geography was no easy task. The development and teaching team had a well-articulated vision and aspired to introduce their students to the sustainability discourse in the context of Geography as a vibrant subject field. They also envisaged a learning scenario that would be dynamic and challenging rather than one associated with the conventional, transmissive learning model that fosters the expertise of the teacher only, merely stresses the importance of memory in assessment and offers learning experiences that assume the student to be a vessel waiting to be filled. Furthermore, they accepted the challenge to facilitate the learning in a fully online environment in order to follow the vision of Unisa to participate in the digital age.

This chapter presented the personal reflections of the academics that were involved in the three phases of the re-design of the Honours in Geography. Through these reflections certain key problems have surfaced, e.g. the resistance of students to participate in the interactive learning tasks and their problems related to the online environment. The academics believe that in terms of the geographical

content, an excellent learning experience has been designed. However, to really realise their vision, the future focus needs to be on innovative learner support strategies to assist students to survive the shift into the digital age.

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