

EDUCATION FOR SUSTAINABLE DEVELOPMENT – ECONOMICS STUDENTS’ PERSPECTIVES AT AN INSTITUTION OF HIGHER LEARNING IN SOUTH AFRICA

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Abstract

Sustainable development has become a major concern in recent years. Faced with a possible unsustainable future, including depletion of natural resources, greenhouse gases, environmental degradation, and the need to provide housing, food, water, and health care for an ever-increasing population, these novel complex problems will challenge citizens globally, and everything that has life in the world. This has led to the need for awareness of sustainable development, from university students, so that they are equipped with the knowledge to advocate for changes in behaviour, for a sustainable future. This study aimed at identifying how knowledgeable Economics students are on sustainability issues, establishing their level of concern on sustainability issues affecting South Africa and the globe, and finding out their personal lifestyles and reflections on sustainability concerns. A quantitative study was adopted, where questionnaires were distributed to second- and third-year Economics students at an institution of higher learning. The results were analysed from 114 responses using t-tests as well as ANOVA tests. The findings indicate that students are highly knowledgeable and concerned about water and energy savings concepts, and least knowledgeable about waste disposal concepts. The students felt that they have a responsibility towards taking care of the environment and society. The results also indicated that their lifestyles do not reflect their concerns about sustainability. Although the study found that the students lack knowledge on some key sustainability concepts such as sustainable development, they are concerned about sustainability of water and energy. In addition, though their lifestyles do not reflect their concerns about sustainability, the students are interested in learning more about sustainability. It is recommended that institutions of higher learning integrate programs to educate the students more on the importance of sustainable development.

Keywords: Sustainability Education, Higher Learning

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1. INTRODUCTION

There has been growing concern globally and nationally for sustainable development to be at the forefront of all operations conducted by human beings, in order to safeguard the future. As the urgency to address social, economic and environmental challenges increases worldwide, education is a major component in striving to achieve solutions for sustainability (Sterling, 2001). Universities hold immense responsibility to pass on the necessary knowledge, skills and understanding to students, to ensure that they are both capable and competent to live lives on the earth in a responsible and caring manner (Clarke, 2012). Education plays a key transformational role in cultivating a cultural change towards a sustainable way of living. Education institutions are therefore being urged to move from mainstream thinking to a new era of education for sustainability for sustainable development (ESD). According to Barth, Rieckmann and Thomas (2015), ESD is expected to create awareness of sustainable development (SD) related problems with the intention of bringing forth innovative contributions to economic, social and environmental issues. Universities play an important role in fostering ESD by providing a link between knowledge generation and knowledge transfer to society. This is achieved by educating future decision-makers as well as practicing social outreach and service (Adomßent, Fischer, Godemann, Rieckmann, Timm and Herzig, 2014). In addition, authors Loubser (2015) Baniyadi, Bazargan, Sadeghi and Zahir (2013) emphasize that teacher education on environmental, social and economic issues plays an important role in determining the future of the world and its development.

According to Barth et. Al, (2015), many universities from all over the world have already initiated activities to address sustainability in their teaching and learning at course level and in their curricula. Uitto and Saloranta (2017) argue however that understanding the different dimensions of sustainability has proven to be a challenge for teachers as they may not feel very competent to include sustainability issues in their teaching. ESD seeks to support students to develop the knowledge, skills, values and world views necessary to act in ways that contribute to more sustainable patterns of living (CAPS, 2011). The starting point for this process is the equipping of student teachers to teach the sustainability component, within the new National Curriculum Statement. This leads to the main aim of the study, which was to find out perceptions of Economics student teachers, at a particular university, regarding sustainability aspects and their

preparedness for classroom delivery at schools. Several questions guided this research:

1. How knowledgeable are Economics student teachers on sustainability issues?
2. What is their level of concern on sustainability issues affecting South Africa and the globe?
3. How do the Economics student teachers' personal lifestyles reflect their sustainability concerns?

2. THEORETICAL FRAMEWORK

2.1 Education for sustainable development

Sustainable development has numerous definitions and there has not been any consensus on any acceptable universal definition. The most widely used definition is found in the Brundtland Report which says that sustainable development is “development that meets the needs of the present without compromising the ability of future generations to meet their own demands” (WCED, 1987). The report emanated from a Commission established by the United Nations (UN) that aimed to come up with global strategies towards the Sustainable Development (SD) agenda. The objectives of SD cannot be achieved without knowledge being disseminated to the grassroots levels and educating the young ones on the importance of sustainability. ESD is a dynamic concept encompassing a new vision of education that seeks to empower people of all ages to assume responsibility for creating and enjoying a sustainable future (UNESCO, 2002). UNESCO (2005) further elaborated on the importance of ESD by emphasizing that education can help in the promotion of values and ethics. This should be done at all levels in order to make an impact on people's lifestyles and behaviors, and consequently to build a sustainable future. The concept of SD has evolved, and efforts to integrate education in SD were endorsed by the 1992 UNCED conference in Rio de Janeiro. This resulted in the adoption of Agenda 21, which provided a comprehensive set of principles to assist governments and other institutions in implementing SD policies and programs, spearheaded by education (UNCED, 1992). Reza (2016) argues that in order for this to be achieved, education from nursery school through university requires re-orientation to include more principles, skills, perspectives and values related to sustainability for current and future societies.

Mochizuki and Yarime (2015) categorize ESD into three progressive levels of learning: first order, second order and third order learning. Their argument is that first order learning level aims at deepening awareness, knowledge and understanding of the concerns of sustainability. It is therefore content-based education *about* sustainability that identifies and assembles relevant knowledge and expertise in traditional academic disciplines to address sustainability problems. According to Tuncer, Tekkaya, Sungur, Cakiroglu, Ertepinar, and Kaplowitz, (2009), educators will only produce students who are ESD literate if they themselves are knowledgeable and have positive attitudes towards the environment, society and the economy. This implies therefore that knowledge is needed for SD concepts in the related content being taught by teachers (Burmeister, Rauch, and Eilks, 2012). Burmeister and Eiks (2013) further add that it is necessary for teachers to have general ESD knowledge as well as specific subject matter content in order to be effective SD advocates. The second form of learning involves responses to sustainability challenges. This is termed education *for* sustainability. It connects and integrates disciplinary knowledge and expertise to advance basic understanding of the complex, dynamic interactions of human-environment systems. According to McKeown (2006), ESD requires a multidisciplinary and comprehensive approach in tackling social issues. In order for this to happen, it requires understanding of the background of an issue. Educators therefore need to adopt a new approach of teaching sustainability that incorporates societal contexts (Cress, 2004). It is imperative then for students to be allowed to think more broadly and look for ways in which sustainability can be interpreted and developed in real life situations (Alvez and Rogers, 2006). The third form, education *as* sustainability, is vital for epistemic change. It leads to cultivating a culture of sustainability, promotes active collaboration with various stakeholders throughout society, and promotes the organization of processes of mutual learning. According to Burns (2011), educators need a shift from transmissive teaching models to transformative learning models, requiring behavioral change.

Berth and Michelson (2013) argue that ESD is based on scholarship that examines the contribution of education to fostering competencies of individuals such as promotion of ethical values and positive attitudes towards sustainability. ESD is therefore aimed at advancing discussions on sustainability literacy and improving teaching and learning to foster those competencies (Cebrian and Junyent, 2015) involves teaching and learning skills to address critical environmental, economic and social issues (Santone, Saunders and Seguin, 2014). In addition, Bursjoo

(2011) argues that teachers need to change their teaching, not only about new knowledge but also changing frames of reference on how to understand the world.

The importance of ESD has been advocated by a number of authors. Santone et al (2014) argue that trainee teachers, as well as sustainability literate teachers, can explain how their fields of study relate to key environmental, economic and social issues within local, national and global contexts. In addition, they say that ESD knowledge helps pre-service teachers in analyzing how their disciplines relate to key environmental, economic and social issues within the local and global communities (Santone et al, 2014). Wiltshire (2008) emphasizes the importance of ESD for teachers. He argues that teachers play a key role in the appropriate socialization of young people for sustainable development. Therefore, it is important that, irrespective of the academic subject matter for which a teacher is responsible, the teacher's major overall responsibility be seen as the moulding of socially and emotionally well-adjusted individuals who respect themselves and others, and take full responsibility for their actions (Wiltshire, 2008).

2.2 Transformative learning in ESD

Transformative learning theory advocates for changes in understanding of the self, leading to behavioural changes, and as a result, effecting changes in lifestyles (Mezirow, 1996). According to UNESCO (2014), ESD can be defined as a “transformative learning process that equips students, teachers, schools, and informal educators with the knowledge and ways of thinking that society needs to achieve economic prosperity and responsible citizenship while restoring the health of the living systems upon which our lives depend”. According to Dannenberg and Grapentin (2016), ESD's main areas of concentration are competencies that transform the society, the economy and the environment. These competencies refer to the skills and abilities necessary to solve SD problems. Bursjoo (2011) adds that the most significant way to effect change in one's established frame of reference or world view is to critically reflect on assumptions underlying a problem defined by a learner. Wals (2017) also emphasizes the importance of transformation learning, saying that it focuses on real life issues essential for engaging learners, and considers learning to be more than acquisition of knowledge. The problem lies in the fact that current education models are marked by a retrospective strategy which limits the concepts of change to the examination of past experiences (Dannenberg and Grapentin, 2016). Development of actions and strategies for ESD and integration of both formal and non-formal learning, are

both key in transformational learning and the possibility of consequent behavior change.

According to Martens (2005), ESD is more than a knowledge base related to environment, economy, and society. It also addresses learning skills, perspectives, and values that guide and motivate people to seek sustainable livelihoods, participate in a democratic society, and live in a sustainable manner. It also involves studying local, and, when appropriate, global issues. ESD empowers learners to take informed decisions and responsible actions for environmental integrity, economic viability and a just society, for present and future generations, while respecting cultural diversity (Martens, 2005). In addition, ESD is holistic and transformational education which addresses learning content and outcomes, pedagogy and the learning environment. It achieves its purpose by transforming society (UNESCO, 2014). Wals (2017), however, argues that critical thinking and transformation is hardly practiced; rather, the main emphasis is on ESD theory, and implementing ESD will remain impossible without commitment by educators to the new paradigm. Additionally, ESD educators must practice what they preach, encouraging values development by example; a position more compelling to the learner (Armstrong, 2011).

As an agent of change, ESD aims at a change in the knowledge, values, attitudes, lifestyle, skills and actions needed for achieving SD (Teise, 2013). A number of authors (Hicks, 2002; O'Sullivan, 2002; and Sterling, 2011) have however argued that the education system is not suitable for ESD. Wals (2010) argues that the education system is teacher-centred and therefore not suitable to impact behavioural change. After all has been said, it should be recognized that sustainability is not a set of behaviours that people can be trained to adapt to, but rather a capacity for critical thinking, reflexivity and transformation (Dannenbergh and Grapentin, 2016).

3. METHODOLOGY

The methodology used in this research is the quantitative method. The object being researched is assumed to be independent from the investigator. The quantitative approach makes attempts to control and predict phenomena. It is guided by theories and prior research findings. The data are deemed to be objective, precise and reliable (Struwig, 2001:16).

3.1 Research design

Research design refers to the strategy to integrate the different components of the research project in a cohesive and coherent way. The research design used in the study is descriptive research. According to Goddard (2005), descriptive research is research in which a specific situation is studied either to see if it gives rise to any general theories or to see if existing, general theories are borne out by specific situations. Zikmund (2003:55) further elaborates that descriptive research is research designed to describe characteristics of a population or phenomenon.

3.2 Population and sample

A population “refers to all potential subjects who possess the attributes in which the researcher is interested” (Arkava and Lane, 1983:27). The population in this study was Bachelor of Education (B.Ed.) students specializing in Economics and Management Sciences (EMS) courses, with Economics as their major subject at a university in Free State province of South Africa. The target population excluded the first year B.Ed. EMS students as they were still new in the university. Simple random sampling was done where questionnaires were distributed to students in their classes. Out of a total population of 160 and sample size of 139 students at 95 % confidence level, the responses received were from 114 students. This is a response rate of 82 %.

4. RESULTS AND INTERPRETATION

4.1 Demographics

The results indicated that majority of the respondents were in the third year of study (52.6 %), and females formed the majority (61.4%). This is generally because there are more females than male students in this course.

4.2 Coverage of sustainability in EMS course

In the first section which deals with the respondents’ level of familiarity with sustainability knowledge, 75.4 % agreed that they had heard the term sustainability being mentioned in EMS courses. This implies that they are familiar with the term sustainability. Regarding coverage of sustainability, 52.6 % agreed that they have covered a sustainability topic in their EMS course, 17.5 % said they have not, while 29.8 % said that they are not sure whether they have covered the topic or not. Independent sample t-tests showed that there is no statistical difference between group means for both second and third years ($F=0.903$, $p=0.344$).

4.3 Knowledge of sustainability aspects

This section aimed to find out the level of knowledge that the student teachers demonstrated on some aspects of sustainability. The question was based on a 5-point Likert scale from strongly disagree to strongly agree. The results were based on means of the responses. The results indicated that students had good knowledge of the various sustainability aspects that required responses, as all of them had scored a mean of 3 and above out of 5. Other observable aspects of sustainability that required more attention included waste disposal knowledge, which had a mean score of 3.31, indicating the familiarity level to be weak positive (Table 1). In addition, the independent t-test showed a significant difference between second and third years in that third year students were more knowledgeable (3.58 ± 1.139) compared to second years (3.00 ± 0.991) $t(112) = -2.924, p = 0.004$).

Sustainable development knowledge and awareness results indicated a mean of 3.25. This is the lowest among all means and indicates lack of knowledge of SD concepts. The independent t-test showed that there is a significant difference between second and third years in that third year students were more knowledgeable (3.50 ± 1.255) compared to second years (2.98 ± 1.173) $t(112) = -2.271, p = 0.025$). BBEE awareness results indicated a mean of 3.50. However, the independent t-test showed that there is a significant difference between second and third years in that third year students were more knowledgeable (3.68 ± 1.049) compared to second years (3.30 ± 1.268) $t(112) = -1.781, p = 0.078$).

Table 1: Knowledge on sustainability issues

Item	N	Mean	Standard deviation
Waste disposal	114	3.31	1.106
Recycling	114	3.76	1.016
Energy and water saving	114	3.88	1.014
Health and wellness awareness	114	3.73	1.050
BBEE awareness	114	3.50	1.169
CSR	114	3.42	1.233
Sustainable development	114	3.25	1.240
Sustainability education	114	3.50	1.154

4.4 Sustainability concerns

This section aimed to find out the level of concern that the student teachers showed on some aspects of sustainability. The section had two main subsections: the first required the respondents to indicate their concerns and the second required them to indicate their level of responsibility towards the broad sustainability aspects (economic, social and environmental).

The first question was based on a 5-point Likert scale, from strongly disagree to strongly agree, and the results were based on means of the responses. The results indicated that students were concerned about the various generic sustainability aspects that required responses as all of them had scored a mean of 3 and above out of 5, with energy and water saving being the issue with the highest concern at 4.04, while waste disposal was of least concern with a mean of 3.28 out of 5 (Table 2).

Table 2: Sustainability concerns

Item	N	Mean	Standard deviation
Waste disposal	114	3.28	1.266
Recycling	114	3.32	1.271
Energy and water saving	114	4.04	1.147
Health and wellness	114	3.99	1.252
BBBEE	114	3.40	1.302
CSR	114	3.43	1.248
Sustainable development	114	3.49	1.271
Sustainability education	114	3.76	1.299

This second question aimed to find out the level of personal responsibility and interest towards the three main facets of sustainability. The question was also based on a 5-point Likert scale from strongly disagree to strongly agree, and the results were based on means of the responses. The results indicated that students agreed that they have personal responsibilities towards economic, social and environmental aspects of sustainability. All of them scored a mean of 4 and above out of 5, with both environmental and societal aspects scoring the highest (4.04 out of 5). Economic responsibility was the least with a mean of 4 out of 5. However, the independent t-test showed that there is a significant difference

between second and third years with regard to their responsibility to the environment in that second year students indicated more responsibility toward it (4.28 ± 0.712) compared to third year students ($(3.87 \pm 1.016) t(112) = 2.476, p = 0.015$).

4.5 Sustainability related lifestyles

This section aimed at finding out about the students' sustainability-related lifestyles. The respondents were asked to choose the activity/activities that describe their lifestyles. The responses were as follows: 77.2 % indicated that they turn off lights when not in use; 72.8 % indicated that they exercise; 67.5 % indicated that they practice double-sided copying when printing; 47.4 % indicated that they recycle; 44.7 % indicated that they participate in cleaning campaigns; and 43.9 % indicated that they take short showers (approximately 5 minutes).

4.6 Interest in sustainability education

The last section asked the respondents about their interest in sustainability education. Most respondents, 87.7 %, indicated they have an interest in learning more about sustainability while 12.3 % indicated they do not have an interest in sustainability. The last question was asked in order to find out more about the student teachers' level of sustainability interest.

5. DISCUSSION

5.1 Knowledge of sustainability concepts

Student teachers indicated that they were more knowledgeable when it comes to environmental aspects of sustainability. Aspects such as recycling, energy and water saving scored high means compared to the other aspects (economic and social). This concurs with a study in Tehran which elicited the same responses, showing that students were more knowledgeable of environmental aspects compared to social and economic (Baniyadi et al, 2013). In the present study, attributive factors may include the intense campaigns from all stakeholders in South Africa about saving water and energy, as well as recent power outages and lack of water in most parts of South Africa. The importance of having knowledge on all three facets is important and has been emphasized by many authors. In addition, the interconnection among these three facets requires that students be taught that they are all linked. Sustainable production and consumption will help save the environment, as will social aspects such as healthy foods and lifestyles.

Sustainable development was the least knowledgeable concept as it scored the lowest mean. This concurs with a study carried out by Loubser (2015) in two other universities in South Africa who found that student teachers did not understand the meaning of SD. According to Burmeister and Eiks (2013), it is necessary for teachers to have general SD knowledge as well as specific subject matter content in order to be effective SD advocates. In light of their lack of knowledge, the starting point for ensuring student teachers play an active role in advocating for SD is for them to become knowledgeable about SD. This is supported by Tuncer et al (2009) who emphasize that educators will only produce students who are ESD literate if they themselves are knowledgeable and have positive attitudes towards the environment, society and the economy.

Another key finding was that the students indicated they have covered sustainability topics somewhere in their EMS course at the university. This is encouraging news since it shows a positive development in addressing the sustainability agenda in South Africa, as educators are the key agents of change in the sustainability journey. Again, this finding concurs with Barth et al (2015) who found that many universities all over the world have already initiated activities to address sustainability in their teaching and learning at course level and in their curricula, an indication that South Africa is playing a leading role in ESD.

5.2 Sustainability concerns

The results broadly indicate that there is a general concern about sustainability issues. This is a positive result as those concerns for the environment, economy and society show that we are on the right path towards ensuring that we achieve the sustainable development goals set for 2030. According to Martens (2005), ESD is more than a knowledge base related to environment, economy, and society as it also addresses learning skills, perspectives, and values that guide and motivate people to seek sustainable livelihoods, participate in a democratic society, and live in a sustainable manner. Concern from the students indicates that the education they have received has fostered their values and their moral obligation towards the environment, society and economy. However, poor concern for waste disposal requires attention considering the high levels of paper litter and other waste material pollution in South Africa. Reza (2016) argues that for behavioral changes towards sustainability to be achieved, education from nursery school through university requires re-orientation to include more principles, skills, perspectives and values related to sustainability for current and future societies.

Other results showed that the students had personal responsibility towards all three spheres of sustainability – economic, environmental and social. The social aspect was the highest. I strongly believe that this is because there is a great deal of concern for the society in terms of education, health and general living standards of people in South Africa. The economic aspect was deemed the least favored by the respondents, concurring with a study by Anna and Saloranta (2017) which found that the teachers were unsure of their understanding of the economic dimensions of sustainability.

5.3 Sustainability-related lifestyles

The results indicated that the respondents switch off lights, practice double-sided printing and do exercise. However, the results in all the other aspects contrasted with their concerns in that majority indicated they do not recycle, they do not take short showers, and they do not participate in clean up campaigns. This contrasts with the students' indication earlier regarding their concern for the environment and other aspects of sustainability. This calls for transformative learning which advocates for behavior change, as emphasized by Wals (2017). Transformative learning focuses on real life issues that are essential for learners to understand and be engaged with and considers learning as being more than merely knowledge-based. As Armstrong (2011) advocates, educators should practice what they preach, encouraging values development by example. This is important as the students will soon be imparting the same knowledge, values and practices to other students when they get into schools. In addition, Teise (2013) illustrates that ESD is an agent of change, and therefore it aims at a change in the knowledge, values, attitudes, lifestyle, skills and actions needed for achieving SD. Without behaviour change, SD will take a long time to be achieved. ESD seeks to support students in developing the knowledge, skills, values and world views necessary to act in ways that contribute to more sustainable patterns of living (CAPS, 2011). This contrasts with most of the behavior indicated by the student teachers. The behavior indicated could be a result of the education model, whereas Wals (2010) argued, the education system is teacher-centred and therefore not suited to impact behavioural change.

6. CONCLUSIONS AND RECOMMENDATIONS

Based on the results from the study, it was concluded that student teachers lack knowledge on some key sustainability issues; student teachers are concerned about sustainability; student teachers' lifestyles do not reflect their concerns about

sustainability; and student teachers are interested in learning more about sustainability.

Following the conclusions above, the following recommendations are advocated:

Programs at universities should be developed to support student teachers to graduate with readiness and capacity to teach sustainability education in schools. Training courses on ESD and transformation education need to be developed by the departments of both basic and higher education in South Africa so that they encourage the teaching of sustainability at schools and enable student teachers to be proactive regarding the sustainable development agenda.

Changes in lifestyles should be advocated in everyday lives, at university level as well as when students graduate, so that they have an impact on the future generations that they will teach. It should be emphasized that since SD concepts involve everybody, projects in and out of school should be initiated in the drive towards conserving the planet that we live on.

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