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Towards a socially responsible Technology education: A case study in Technology teacher education programme

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Format of presentation

- Argument
- Rationale
- Context
- Clarification of terms
- Research questions
- Conceptual framework
- Research design
- Presentation of results and analysis
- Conclusions
- Implications

Argument

- Adopting the pedagogy of service learning in technology education can play a critical role in promoting sustainable development and improving the capacity of the people to address environment and development issues, whilst promoting academic learning as well.
- Studies on, student engagement in service learning, report that students showed positive attitudes and values and a better understanding of social issues (Stears & James 2011).

Argument cont.

- Therefore it is envisaged that by engaging pre –service technology education teachers in service learning these graduates will have added values if they are not only technically competent but are also disciplined in attitudes, values and behaviours that allow them to participate as critical citizens in our democracy.
- As a result whilst developing their knowledge and skills pertaining to technology education, students will be able to reflect on their roles as educators in a broader community and as agents of change in that community while engaging in service learning.

Rationale

- Greater pressure on higher education institutions to be involved in community engagements
- White paper on education and training (DoE, 1995, p. 35) supporting the idea that education should “create environmentally literate citizens and ensure that all South Africans enjoy a decent quality of life through the sustainable use of resources”
- The intermediated phase CAPS Science and Technology policy (DoE, 2012) foregrounds social transformation and social justice via ESD.
- Therefore technology teacher education programmes should respond to the challenge of educating pre-service teachers to teach technology education in a way that is socially responsible and in doing so educate learners to use their technological knowledge to become socially responsible citizens

Context

- Opportunity arose to fuse service learning and Education for Sustainable development (ESD) in a manner that responds to the desired learning outcomes related to the plastics section of the EDTE 220 module.
- The central focus of ESD is to prepare our younger generation to become responsible citizens of the future (UNCED, 1992) therefore pre-service teachers should learn how to take responsibility for both themselves and their society for today and in the future, (Mogensen & Schnack, 2010).

Clarification of terms

- Service Learning is teaching, research, and service that are both in and with the community, implying that values of reciprocity and mutual benefit are fundamental aspects of service learning (Bringle, Hatcher, & Holland, 2011).
- It is a structured learning experience with explicit outcomes and assessments that combines community service with preparation and reflection. Service learning provides college and university students with a “community context” to their education, allowing them to connect their academic coursework to their roles as citizens.
- Service learning was employed as a heuristic model by which to educate and engage students with respect to sustainability within technology education.

Clarification of terms cont.

- The term sustainability has evolved since it was first used in Germany in 1840.
- There are multiple definitions of the term sustainability
- A commonly used definition is that of World Commission on Environment and Development (WCED): *“Sustainable development is development which meets the needs of the present without compromising the ability of future generations to meet their own needs”* (WCED, 1987, p.2).
- The above definition is basic, focuses on the environment and it does not embrace societal or economic aspects that impinge sustainability
- Gough (2002, p. 29) argues that ‘we cannot hope to separate our understanding of the environment from our social and economic interactions with it’
- The three pillar model of sustainability does not attribute priority to any of the pillars.

Research questions

- *What are EDTE 220 students attitude towards service learning?*
- *What are EDTE 220 Students understanding and perception of and attitude to sustainable development?*
- *How do their understanding and perception of SD compare to the literature?*

Conceptual framework

- The three pillar model of sustainability is used as a framework to guide the development of the questionnaire and the analysis

Research design

- Data was collected in two phases

- Phase one:

participants: EDTE 220 students and their community members

Students engaged in participatory action research activities in their communities to identify problem relating to sustainability and jointly find solutions that contributed to communities living more sustainable lives. A photo journal was maintained by the students during this phase of data collection.

Research design cont.

- Phase two: participants students (180 out of 216) – answered a questionnaire that aimed to address the three research questions posed in this study. The questionnaire entail completing biographical data, provide definitions for sustainability answering questions on sustainability /sustainable development in terms of attitude and behaviour.
- The paper reports on phase two of the research, where a qualitative analysis of a questionnaire administered to students in the EDTE 220 course was undertaken

Research design cont.

- Grounded analysis was used within the keyword dataset, to identify the ideas and phrases used by the participants in order to develop categories within the three pillars of sustainability (environment, society, and economics) and gain a general understanding of the ideas and actions participants were linking to sustainability.
- For the definition and attitudes data, content analysis was performed and central themes and ideas within the datasets were extracted to determine common as well as unique perceptions, attitudes, and definitions of sustainability.

Presentation of results: Service learning

- 96% of EDTE 220 students enjoyed interacting with their communities while engaging in service learning. Students prefer service learning as a teaching strategy as it
- took them outside the lecture room,
- was not boring,
- allowed them to bring about change in their community,
- made them more aware of sustainability and issues of sustainable development,
- allowed for the application of the theory from the lecture room into the community,
- allowed them to identify problem relating to sustainability in their environment that they would have ignored under “normal” circumstances,
- contributed to obtaining better marks in assessment,
- made them more aware of their civic responsibility towards their community,
- promoted team work and helped to improve/encourage communication with class mates that they would ignore in a “normal lecture”.

Presentation of results: Service learning

- 4% of the students portrayed a negative attitude towards service learning. They did not enjoy service learning as:
 - they did not enjoy community work,
 - found the project messy and dirty,
 - time consuming,
 - too much of an effort,
 - they preferred to have their knowledge applied to a case study in a lecture room.

Key words associated with sustainability

- 86% of students mentioned a specific environmental issue or some type of action connected to sustainability, for example energy, fossil fuels, recycling, and global warming
- Even though energy is commonly an area where sustainable principles have been applied, a few of the keyword suggested energy to be the only issue sustainability was meant to address. This mean that some student think of sustainability in terms of energy only
- The most common action suggested was sustaining/ maintaining, reducing, renewing, and conserving.
- The most common temporal category was mention of the future.
- Human-related factors mentioned within the keywords dataset included standard of living, population, human needs, as well as innovation and education.
- Fewer respondents (9%) mentioned environmentalism, being green, and responsibility. Even fewer (5%) mentioned larger conceptual elements such as processes and impacts.

Definition of sustainability

- Definitions were categorized as environmental, societal, and/or economical.
- The definition and keyword datasets reveals that the respondents comprehend the concept of sustainability in light of environmental and societal factors.
- Environmental responses made up 78% of the responses and include example like global warming, energy, recycling, reusing, pollution, resources, going green and ecosystems.
- The definitions relating to the environment were further categorised as addressing resources or support human (egoistic) and those that refer to the environment beyond human centred needs (biospheric).
- A closer examination of definition espousing the idea of human support includes human needs, future generation needs, and maintaining resources. It is worth noting that the language used did not represent any underlying value to protecting or conserving the environment
- Definitions that centered on the environment beyond human needs used language showing support or caring for the environment and its resources
- Societal definition of sustainability made up 22% of the responses and included reference to people, humans, or elements related to people such as generations, or lifestyles.
- An interesting finding is that the third component of sustainability, economics, was not referred to by the respondents. This particular finding is considered to be antithetical to the goals of technology literacy as sustainable practice needs to be financially viable and generate profit for it to be workable. However, this concept seemed to be lost to most students.

Attitude towards sustainability

- Three general attitudes towards sustainability emerged from the data, one of support for the concept, one of support but with a reason for not personally performing and one of limited support.
- A positive attitude prevails in respect of sustainability but behaviour does not always follow. There is a disjuncture between attitudes and behaviour. 72% of respondents, although supportive of sustainability, included a reason or rationalisation for lack of behaviour
- Students were asked to consider which sustainability projects they would most like to see implemented on campus. 64% of the students, supported development of renewable energy sources for campus, Recycling activities follow close behind at 35% , which reveals the importance that is still placed on recycling as a major proenvironmental behaviour, and 1% of the students did not want to be involved in any project as projects on sustainability was hard work and too time consuming

Conclusion

- Service learning allows for practical application of theory to tasks that have real consequences in the world students inhabit. It affords students the opportunity to process information in context, from different perspectives. This means that service learning engages students beyond mere intellectual development- it allows students to know (understand), feel (make meaning) and do (apply their skill) as contributing members in society.

Implication

- Explicit instruction is needed in the EDTE 220 module to move definitions and perceptions on sustainability beyond a limited view of the lifestyles, energy and needs, In order to embrace all three pillars (environmental, economic and societal) of sustainability.
- Service learning should be used as a pedagogical tool to enhance learning as well as civic responsibility in pre- service teachers.