

Enhancing Sustainability Awareness through Social Learning Experiences on Campuses

Rashika Sharma

Abstract—The campuses at tertiary institutes can act as a social environment for peer to peer connections. However, socialization is not the only aspect that campuses provide. The campus can act as a learning environment that has often been termed as the campus curriculum. Many tertiary institutes have taken steps to make their campus a ‘green campus’ whereby initiatives have been taken to reduce their impact on the environment. However, as visible as these initiatives are, it is debatable whether these have any effect on students’ and their understanding of sustainable campus operations. Therefore, research was conducted to evaluate the effectiveness of sustainable campus operations in raising students’ awareness of sustainability. Students at two vocational institutes participated in this interpretive research with data collected through surveys and focus groups. The findings indicated that majority of vocational education students remained oblivious of sustainability initiatives on campuses.

Keywords—Education for Sustainability, campus learning, social learning, vocational education.

I. INTRODUCTION

TERTIARY institutes can educate students either through the explicit curriculum or transversely by the latent curriculum [1]. Reference [2] defined latent or hidden curriculum where students learned concepts that were not openly intended and usually was knowledge that was gained in educational settings such as the campus environment and often considered a side effect of education. These forms of hidden curriculum (informal and campus) can also enhance learning and to be most effective in initiating change in students’ sustainable practices, there needs to be an integration of formal, informal and campus curriculum at tertiary institutes [3]. Reference [4] refers to these as having a green campus and a green curriculum which then promotes a green culture.

II. LITERATURE

Tertiary education is perceived as a means of increasing individuals’ knowledge and advancing vital skills that contribute towards a country’s economic development and “standard of living as learning outcomes are transformed into goods and services, greater institutional capacity, a more effective public sector, a stronger civil society, and a better investment climate” [5, para. 1]. Tertiary education or higher education is generally education commenced after secondary education completion. Universities, colleges, technical training institutes, and private training organizations are all key players of tertiary education.

Higher education is believed to support sustainability

R. Sharma is with Unitec Institute of Technology, Auckland, New Zealand. (phone: +6498154321; e-mail: rsharma@unitec.ac.nz).

education and can assist in creating graduates who can work towards shaping a sustainable future [6], [7]. Not only do tertiary graduates help advance the economic development of a nation but also play a critical role in sustainable development [8]. Reference [7] states that the tertiary education sector has a moral responsibility to educate students and instill in them awareness, knowledge, skills, and values that can help create a sustainable future. Reference [7] further elaborates that it has been observed that often graduates from reputed colleges and universities continue to live unhealthy, inequitable and unsustainable lives. This indicates that their education may not have inculcated in them the desire to live more sustainably.

In hindsight, Universities had pledged their commitment to embedding environmental sustainability in higher education with the 1990 Talloires Declaration of University Leaders for a Sustainable Future agreement [9]. The 1991 Halifax Action Plan for Universities of the Conference on ‘Creating a Common Future’, and 1993 Kyoto Declaration of the International Association of Universities [9] are additional examples of the commitment higher education institutes have taken to initiate sustainability education. However, these commitments are focused on universities and seldom filter down to vocational education centers and polytechnics. While most universities have demonstrated commitment to education for sustainability, many technical and vocational institutes have not prioritized this. Therefore, it is critical that Technical and Vocational Education and Training (TVET) prioritizes education for sustainability. The Bonn Declaration [10] acknowledged that “since education is considered the key to effective development strategies, technical and vocational education and training (TVET) must be the master key that can alleviate poverty, promote peace, conserve the environment, improve the quality of life for all and help to achieve sustainable development” [11, p. 2]. Technical and Vocational Education and Training institutes role in sustainable development is highlighted in the following extract.

“Transforming the economy and society in line with the concept of sustainable development is only possible if people embrace the inherent values and attitudes of this idea, and if people possess the needed skills and are able to apply them in practice. From this perspective, it is not surprising that education in general and Technical Vocational Education Training in particular are ascribed a significant role in this transformation process” [12, p. 27].

Clearly, as highlighted by the statement above, TVET plays

a significant role in transforming the economy. Therefore, if tradesmen possess sustainability skills along with the necessary technical skills, sustainable development may be achievable. UNESCO's 'Green TVET' concept encourages tradesmen not only possessing requisite technical knowledge but also knowledge and commitment to sustainable development [13]. Therefore, TVET institutes can create an environment that can nurture students' awareness of sustainability both in the curriculum and through the campus environment. The TVET institutes campus curriculum is also a learning environment [1] and it should work as a living example for trade students. The campus curriculum and the classroom curriculum need to work hand in hand. Therefore, the effectiveness of the TVET institutes campus curriculum can influence students' awareness and instill into them sustainability values. Hence, research was conducted to determine the effectiveness of New Zealand TVET institutions in Education for Sustainability.

III. METHODOLOGY

The green campus initiatives were compared at two New Zealand TVET institutes in order to examine their effectiveness in raising awareness of sustainability. For the purposes of maintaining anonymity, the TVET institutes will be referred to in this paper as Institute Alpha and Institute Gamma. At Institute Alpha, 26 students participated in the pre-survey and 21 in the post-survey. At Institute Gamma, 41 students participated in the pre-survey and 42 in the post-survey. The survey was designed to gauge students understanding of the various green campus initiatives they observed during the duration of their chosen study programme. Additionally, 12 students from each institute participated in focus group interviews sharing their experience with green campus initiatives. The quantitative data generated through the surveys was analyzed using MS Excel and qualitative data was analyzed using thematic analysis [14]. The next section discusses the findings.

IV. RESEARCH FINDINGS

A. Survey Responses

The students completed the pre-survey before they embarked in their TVET studies. The students were asked to indicate whether they had observed any green initiatives during their short time at the campus. Their responses showed that more than 50% of the TVET research participants had observed green initiatives on campus represented in Fig. 1 below. Approximately 15% students from both institutes had not observed any such activities and approximately 20% were unsure.

During the final weeks of their one year at TVET studies, students were again requested to participate in the post-survey. The survey was exactly the same as the pre-survey. Fig. 2 shows the responses that were generated.

The majority of students in the post surveys indicated that they had either not seen any campus operations or were unsure

on what encompassed sustainable campus operations. The results highlighted a regress in students' connection with sustainability after their year in trade studies. Overall, in Institute Alpha, there was an 18% drop in students' observations of sustainable practices on campus between the pre- and post-survey. There was a 10% increase in students who stated that they had not observed any sustainability related practices on campus.

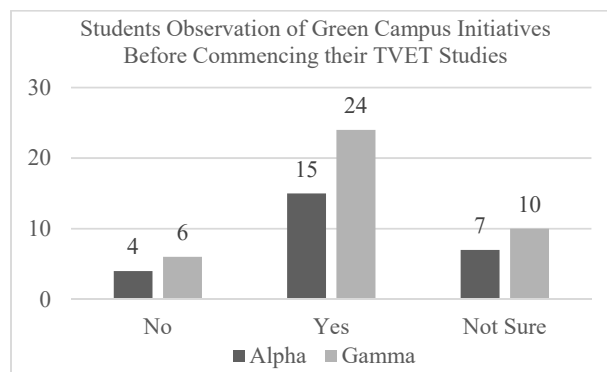


Fig. 1 Students rating of their observation of green campus activities before starting their TVET programme

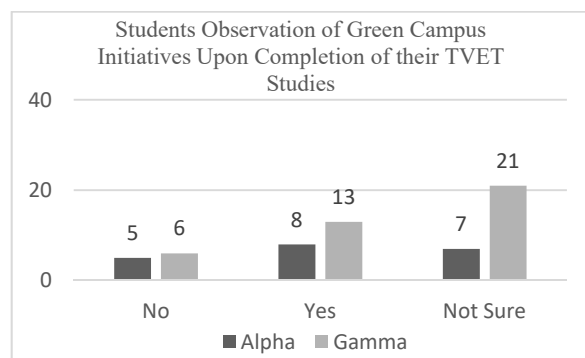


Fig. 2 Students rating of their observation of green campus activities upon completion of their TVET programme

Approximately 35% students in the post surveys appeared to have difficulty recognizing green campus practices at Institute Alpha. At Institute Gamma there was also great uncertainty amongst students (>50%) on their observations of green campus operations. At Institute Gamma, in both the pre- and post-survey, higher percentages of students were unsure about green campus practices on campus. The selection of the 'not sure' option in the survey could either be a consequence of students lacking environmental literacy or are disengaged from campus operations.

Out of the 67 survey participants, only 17 were able to provide examples of the various sustainability activities they had observed on campus. From these 17 participants, seven were students from Institute Gamma and ten from Institute Alpha. The summary of their responses are presented in Table I.

TABLE I
STUDENT'S EXAMPLES OF CAMPUS ACTIVITIES

	Pre-Survey Responses	Post-Survey Responses
Institute Alpha	Institute Alpha students' most common response for green campus operations were vegetable gardens. Some extracts were "we grow food in the gardens that people can have whenever," and "Gardens, vegetable gardens." Recycling bins rated second most visible aspects with comments such as "Signs telling us to recycle different color bins for rubbish" and "Posters & specific bin."	In the post survey, only two students gave examples of sustainability activities with one comment mentioning "the living garden" and another observing "different bins for different types of rubbish." Three respondents mentioned "cutting materials in a controlled environment, using all timber" and "recycling timber products."
Institute Gamma	At Institute Gamma, only two students mentioned observations of green activities on campus with recycling being the only activity they mentioned, "recycling, different bins for different litter" and "different bins for different waste." There was also observation made on "bike shelters" and two students mentioned sustainable house project on campus stating there are "two houses on the grass. One house is used as a baseline using normal building practices" and another commented that "there's a study of higher quality housing happening."	In the post survey, three Institute Gamma students added examples of "disposal of chemicals and materials." The post survey again focused mainly on recycling as sustainability activities on campus with comments such as "we have been putting our waste in different bins to help our environment." Two students also mentioned the reduction of building materials stating that they "sort out different waste materials, ensure that recyclable materials are recycled."

B. Focus Group Responses

In the focus group interviews, students were again invited to identify the various sustainability operations they had seen on campus. The main activities the 12 students recognized at Institute Alpha were:

"They grow veggies around here for the students to take," "encouraging us to plant our own fresh fruit and veggies," "paper bins and normal rubbish bins," "water fountain... it tells you how many bottles have been filled," "windmill" and "in toilets sign is up just about how much paper you use to wipe your hands and things like that. There's signs on all the toilets around here, there is eco soap."

The students were quick to recall the recycling bins along with the toilet signage (emphasizing on saving water and energy) that was very visible to students on a daily basis.

At Institute Gamma, the 12 students identified the green open spaces as observations of a green campus with some stating "enough space for people to enjoy the environment" and many mentioned recycling ("a red one and a yellow one, like all the bins are, there's a glass one, a plastic one and a landfill,") some recalled bike shelters ("There's bike shelters so you could lock your bike up and most of the places where you lock your bike up are also covered,") a sustainable house project ("They're doing an experiment with two houses on the field. They've apparently got one that's normal and one that's got slightly better insulation stuff so they're doing studies on it as well") and a waste minimization project ("measuring and weighing how much wastage we use on building a house.") At both institutes, some focus group participants had difficulty identifying green campus operations.

The physical isolation of the trades section on both campuses could be an influential factor contributing to reduced exposure to campus operations. This aspect was identified by two Institute Alpha students stating that "there's not that many examples to be honest" and "I'm sure there's other stuff on like the other side of campus. We don't go over that side at all, pretty much unless people drive that way but apart from going between the classrooms."

It is apparent from both the survey and focus group responses that trade students had very little awareness of green campus operations with majority (>50%) unsure about

examples of these on campus. The discussion section deliberates on this aspect further.

V. DISCUSSION

People's attitudes and engagement with sustainability efforts on campus is mostly affected by the continuous visibility of these activities which is termed as "sustainability affinity" [15]. "Sustainability distance," on the other hand is the non-visibility of such activities due to various factors such as isolation [15]. At both institutes, the main green campus operation students most easily identified and which were most visible were the recycling bins. Generally, the sustainability actions or green operations are centered in the campus hub. As in this case, when students are isolated from the hub, they are least likely to be exposed to other activities on campus that are designed to promote and raise awareness of sustainability. This in turn hinders social learning and reduces students' ability to relate to other green campus aspects.

On most TVET campuses, trade departments generally are isolated from the campus hubs because of the nature of the activities associated with the trades such as construction noise or noise from panel beating. Therefore, the proximity to the main campus hub appears to play a pivotal role in exposing students to sustainability activities. These campus operations or activities are fairly useful in demonstrating practical aspects of sustainability and communicates institutional values and attitudes to students. In many instances students learn better when learning and engagement revolves around campus-focused projects and activities [3]. Campus operations and initiatives have also been identified as inculcating in students the principles of awareness and stewardship of the natural world [16]. Student engagement in sustainability initiatives can promote environmentally responsible citizenship by empowering students to become agents of change [16]. Allowing students, the opportunity to engage in action-oriented environmental initiatives can help them reflect on their own behavior [17]. Visible sustainable campus operations can demonstrate to students the applicability of sustainability in everyday life and this may encourage a change in students' attitudes and behaviors which can be a vital key for sustainable development.

VI. CONCLUSION

As demonstrated by this research, trade students generally are isolated from the main hub of campuses and therefore may not be exposed to many of the green campus operations. This in turn reduces their exposure to sustainability and in turn hinders the social learning opportunity provided by tertiary institute campuses.

Rashika Sharma is a lecturer in Integrated Practice at Unitec Institute of Technology in New Zealand specializing in sustainable practice, societal context and generic skills on the Bachelor of Applied Technology. Rashika is currently pursuing a Doctoral Degree in Education from Deakin University in Australia and holds a Master's degree in Education from Unitec Institute of Technology. Rashika's research focus is on education for sustainability and takes keen interest in student centered teaching and learning strategies. Rashika has also taught at the Fiji Institute of Technology in Suva, Fiji.

REFERENCES

- [1] D. Rowe, "Environmental Literacy and Sustainability as Core Requirements: Success Stories and Models," in *Teaching Sustainability at Universities: Towards Curriculum Greening*, W. Leal Filho, Ed. Frankfurt: Peter Lang, 2002, pp. 79-103.
- [2] B.S. Bloom, *Human characteristics and school learning*. Belmont, McGraw-Hill, 1976.
- [3] P. Hopkinson, P. Hughes, and G. Layer, "Sustainable graduates: linking formal, informal and campus curricula to embed education for sustainable development in the student learning experience," *Environmental Education Research*, vol. 14, no. 4, pp. 435-454, 2008.
- [4] S. Majumdar, "Developing a Greening TVET Framework" Accessed on 20 February 2017 from http://www.unevoc.unesco.org/fileadmin/user_upload/docs/Greening_TVET_Framework-Bonn-Final_Draft.pdf, 2011.
- [5] World Bank, Tertiary Education (Higher Education). Accessed on 21 March 2016 from http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTEDUCATION/0,,contentMDK:20298183~menuPK:617592~pagePK:148956~piPK:216618~theSitePK:282386,00.html#what_why, 2013.
- [6] I. Thomas, "Sustainability in Tertiary Curricula: What is stopping it happening?" *International Journal of Sustainability in Higher Education*, vol. 5, no. 1, pp. 33-47, 2004.
- [7] D. Cortese, "The Critical Role of Higher education in Creating a Sustainable Future," *Planning for Higher Education*, vol. 31, no. 3, pp. 15-22, 2003.
- [8] Parliamentary Commissioner for the Environment, "See Change: Learning and education for sustainability: Outcome evaluation," http://www.pce.govt.nz/reports/allreports/1_877274_56_9.shtml, 2004.
- [9] I. Thomas, and J. Nicita, "Sustainability Education and Australian Universities," *Environmental Education Research*, Vol. 8, No. 4, pp. 475-492, 2002.
- [10] UNESCO, "Bonn Declaration," Accessed on 17 May 2017 from http://www.esd-world-conference2009.org/fileadmin/download/ESD2009_BonnDeclaration080409.pdf, 2004.
- [11] UNESCO-UNEVOC, "Orienting Technical and Vocational Education and Training for Sustainable Development: A discussion paper," Retrieved from http://www.unevoc.unesco.org/fileadmin/user_upload/pubs/SD_DiscussionPaper_e.pdf, 2006.
- [12] Gesellschaft für Internationale Zusammenarbeit, "TVET for a Green Economy," Accessed on 15 November 2016 from http://www.enterprise-development.org/wp-content/uploads/TVET_Green_Economy.pdf, 2013.
- [13] UNESCO, "ESD + TVET. Promoting Skills for Sustainable Development," Accessed on 20 February 2017 from <http://unesdoc.unesco.org/images/0021/002162/216269e.pdf>, 2012.
- [14] M. Somerville, "The Nitty Gritty of Analysis: Analysing a Body of Qualitative Data". Unitec Workshop, Auckland. New Zealand, 2003.
- [15] A. Franz-Balsen, and H. Heinrichs, "Managing sustainability communication on campus: experiences from Lüneburg," *International Journal of Sustainability in Higher Education*, vol. 8, no. 4, pp. 431 – 445, 2007.
- [16] M. Dahle, and E. Neumayer, "Overcoming Barriers to Campus Greening: A Survey among Higher Educational Institutions in London, UK," *International Journal of Sustainability in Higher Education*, vol. 2, no. 2, pp. 139-160, 2001.
- [17] D. Carpenter, and R. Dyball, "Outside In - Experiential Education for Sustainability," in *Innovation, Education and Communication for Sustainable Development*, P. Lang, Ed. Germany: Peter Lang, 2003, pp. 7663.