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University student volunteering alignment with sustainability principles

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This research paper reviews the concept and practice of tertiary sciences students doing environmental volunteering, otherwise known as conservation volunteering, as a core part of their course to check its alignment with sustainability principles. First year Natural Sciences students at Edith Cowan University do five days environmental volunteer work with community groups as practicum. Initial research data displays the number of volunteer hours done by students in various types of activities, locations and organisations. Preliminary quantitative evaluations and qualitative comments demonstrate students' positive attitudes and outcomes from their volunteering experiences. Definitions and classifications of sustainability from current literature are discussed as part of the curriculum design review process. Initial data from host organisations and students suggests that this environmental volunteering contributes to employability skills, although the program needs to be evaluated as one component of an integrated program of Work-Integrated Learning (WIL) that the students are required to complete. Students learn about potential careers and the environment industry's reliance on volunteers. Students learn and practise specific skills (e.g. animal handling) and contribute to communities and the environment.

Keywords: Volunteering, sustainability, environmental volunteering, conservation volunteering

Introduction

This research paper provides an innovative example of incorporating sustainability and volunteering into tertiary science students' experience. This paper provides and discusses initial research data about the types of environmental volunteering experiences that university students chose as part of their first year of various sciences degrees. After the stage of curriculum review and redesign, several ways of data gathering were implemented to investigate the impact of volunteering in conservation groups on students' learning outcomes. The purposes of this paper are threefold: 1) describe environmental volunteering by Natural Sciences students as part of their core first year practicum while focusing on student outcomes; 2) explore the value of such volunteering to both students and the organisations involved based on preliminary analysis of evaluations from 2012; and 3) position their experience against current definitions and models of sustainability and volunteering. Pertinent issues are discussed integrating discipline theory and knowledge with the professional environment.

Environmental Education

A starting point for Australia's enhanced national effort in support of ecologically sustainable development (ESD) was the *Environmental Education for a Sustainable Future National Action Plan* (Environment Australia, 2000). The principles were that environmental education must: 1) involve everyone; 2) be lifelong; 3) be holistic and about connections; 4) be practical; and 5) be in harmony with social and economic goals and accorded equal priority (Environment Australia, 2000). A key element was towards all Australians gaining the knowledge, values and skills to make a positive difference to the protection and conservation of Australia's environment.

Sustainability in Australian Universities

Universities Australia has promoted the idea that universities need to be sustainable in all their operations. In terms of teaching, Australian universities are beginning to embed sustainability principles and practices in their curricula, with some courses having core sustainability units/subjects, even outside of the environmental and natural sciences. Sustainability has also been embedded in

day-to-day administration and running of universities with most having sustainability policies and environmental officer(s) to promote sustainability in elements such as waste management, bushland protection and energy use.

Volunteering

Australia's National Volunteering Strategy encourages educational providers to promote, support and recognise volunteering in schools and universities (Australian Government, 2011). Integrated approaches are needed at national and institutional level to support the development of university student volunteering (Darwen & Rannard, 2011). Volunteering can be an important way for young people to develop confidence and skills offering a clear pathway to social and economic participation in the future (Australian Government, 2011). Schools and universities have increasingly introduced volunteering programs for students to develop a sense of social responsibility, connectedness and leadership as well as to develop employability skills (Australian Government, 2011). While recent initiatives to promote student volunteering in the UK have been welcomed, relatively little has been documented about its use and role in higher education and its assumed benefits (Holdsworth & Quinn, 2010).

Although there is no agreed definition of volunteering, the three criteria of free will, non-pecuniary motivation and benefit to others can be applied to an action to assess whether it is volunteerism (Hockenos, 2011). Another description or definition differs: all volunteering involves freely giving time to help others or support a cause yet some people may be reimbursed for the cost of volunteering (Australian Government, 2011). Volunteering may be viewed broadly to include tertiary students volunteering as part of their course, particularly in the field of environmental volunteering.

The example of environmental volunteering described in this paper fits the three criteria of volunteering. Yet it is not according to the Australian Bureau of Statistics (ABS) as they define a volunteer as someone who willingly gave unpaid help in the form of time, service or skills through an organisation or group. Unpaid work under some form of compulsion, for example as part of study commitments, is excluded from ABS measures (Australian Bureau of Statistics, 2010).

Student volunteering makes a relatively small contribution to the voluntary sector in terms of number of participants and scope but it reinforces an ideal of self-reliance and relates to the development of employability skills (Holdsworth & Quinn, 2010). However, data on tertiary student volunteering is not readily available. Volunteering has the potential to foster a form of moral engagement that recognises the need to take responsibility for others (Holdsworth & Quinn, 2010). Students are becoming more aware of the need to extend their curriculum vitae and this future benefit for their own career prospects is motivating some to undertake volunteering (Holdsworth & Quinn, 2010). Recruitment for volunteering positions may require selection processes including applications (typically comprising a curriculum vitae and statements addressing selection criteria) and interview. So the application process provides students with worthwhile experiences during the recruitment process before the actual experience of volunteering, including the potential of not being accepted. Volunteering as unpaid work or service which contributes to the work of a formal organisation and is managed by a workplace model differs from volunteering as activism or as leisure according to Rochester's three perspectives (Smith & Cordery, 2010).

Conservation volunteering for environmental sustainability education

Education for Sustainability (EfS) has broad responsibilities to expand consciousness of the need to apply sustainability principles collectively and in our everyday lives (Haigh, 2006). Such education does not necessary need to be in the classroom, and indeed informal environmental education, such as field work and work experience, can be an effective way of increasing understanding of environmental and sustainability issues, whilst also promoting ongoing learning and greater personal involvement in environmental action (Haigh, 2006). This highlights the rationale for environmental volunteering and Work-Integrated Learning (WIL) to be incorporated throughout higher education courses. WIL is defined as a range of approaches and strategies that that require university students to be situated in a workplace to learn. Theory is integrated with the practice of work within a purposefully designed curriculum (Patrick et al., 2008). Many non-government organisations (NGOs) are based on the notion that a community of people can improve the world via a collective effort across many locally-based projects. The hard, slow tasks of environmental conservation, education and

restoration may not gain media attention but through this direct, practical experience people learn how to care for and respect nature. Internationally, volunteering makes major contribution to conservation of biodiversity and improved sustainability outcomes, especially in developing countries (Devereux, 2008). Conservation volunteering may offer the opportunity to make a difference to specific environmental projects through a politically and economically appealing model of social enterprise (Lorimer, 2010). Environmental volunteers are generally not strongly motivated by reasons that one might expect from the general volunteering literature (Wahl, 2010). So data on tertiary students' motivation will make a useful contribution to and comparison with the literature.

While the trend in higher education is for increasing student volunteering and involvement in community activities, there has been little research on the effects of the experience on volunteers, especially in the context of conservation and environment (Bruyere & Rappe, 2007). Significant attitudinal and behavioural differences were identified between environmental and non-environmental volunteers, including stronger geographic attachment in the former which resulted in greater loyalty to a local area (Randle & Dolnicar, 2006), although participation in conservation volunteering may not necessarily change deep-seated perceptions and attitudes towards nature (Halpenny & Cassie, 2003). Volunteering is more likely to provide quantifiable benefits like increasing work skills that may lead to a better paying job (Alonso & Liu, 2012). Volunteers make a remarkable sacrifice trading the opportunity cost of engaging in other activities in exchange for the common good (Alonso & Liu, 2012). Though student volunteers are less likely than other volunteers to help plan or coordinate services, students are not used exclusively for routine tasks (Edwards, Mooney, & Heald, 2001).

The benefits of the volunteer to the organisation are generally well recognised and more tangible than the outcomes for the volunteer. Community volunteer work and involvement is especially crucial in rural areas where human and financial resources are limited (Alonso & Liu, 2012). Although environmental volunteer organisations are experiencing changes in their cultures, structures and funding arrangements, which make the tasks of functioning and attracting volunteers increasingly difficult, many are increasingly reliant on volunteers (Dolnicar, Irvine & Lazarevski, 2008) with some dependent on volunteers for particular skills. Greater recognition of environmental volunteers as co-learners and co-producers of ideas about ways to intervene in ecosystems and their rehabilitation is called for (Buizer, Kurz, & Ruthrof, 2012), especially when tertiary sciences students are the volunteers (Haigh, 2006).

Natural Science Practicum at Edith Cowan University

Natural Sciences Practicum 1, SCI1120, consists of the equivalent of five days of volunteer work or work experience with an agency, NGO or industry related to the natural sciences. Students gain practical and hands-on experience, and make a positive contribution to the work that these groups undertake. Although students have considerable flexibility in the type of work undertaken, the emphasis of this first year practicum is on volunteering for a non-profit and often community-based organisation. Students are encouraged to use this initial experience as the foundation from which to build a network of contacts and a portfolio of extra-curricular experiences during their time at university that will enhance their career prospects. In their third year, students complete a second practicum (SCI3214 Natural Sciences Practicum 2) which is more formal work experience via a ten day placement in an organisation(s) of the type they may typically work for upon graduation and is designed as a capstone of their WIL.

SCI1120 is a core (compulsory) component of undergraduate degrees in biological sciences, marine and freshwater biology, conservation and wildlife biology, environmental management and environmental science in the School of Natural Sciences at ECU. This unit has been running since 2007 and evolved from other work experience programs which were core components in the environmental management degree for over twenty years. In 2007, it was decided to formally divide these activities into two units: a first year practicum aimed at volunteering and a third year unit focussed on formal work experience, a move strongly supported by the course consultative committee (which comprises industry representatives). At the completion of their volunteering, employers or supervisors give a written letter, completed evaluation form and/or standard certificate as evidence of their volunteering efforts.

Students must write a succinct reflective evaluation (answering specific questions). Students are given considerable flexibility and scope in the type of volunteering and choice the organisations they help. A

noticeboard and internal website promoting suitable organisations and volunteer programs is maintained by the coordinator of the practicum and students use this and/or their own contacts to organise a placement suited to their availability and that of the organisation. The co-ordinator also organises activities (such as plant propagation and revegetation) with local organisations which are more convenient for some students (eg international students). Many students volunteer at more than one organisation. Students have the whole academic year to complete their volunteering.

Intended purposes

The two stated student learning outcomes of SCI1120 are: to participate confidently in volunteer or work related activities of a host agency, NGO or industry; and to describe the relevance and application of activities conducted by the agency, NGO or industry with which they volunteered or undertook work experience. This unit, along with others, targets work-readiness. It helps prepare the students with practical knowledge in the field they are interested in working in upon graduation. The organisations in which students volunteer often employ graduates and several graduates have gained employment with the organisation they volunteered with, sometimes supervising/organising other volunteers in a paid capacity.

An intended purpose of the first year practicum is for students to learn about the structures of various environmental groups, their sources of and reliance on funding, and their links to government and other organisations, and to understand how these fit within the broader environmental and conservation industries. NGOs play an important role in the conservation of biodiversity and in promoting the sustainable use of natural resources, ranging from advocacy to 'hands on' action, and they rely heavily on volunteers to perform these functions, often with a strong links to local communities (Brightsmith, Stronza, & Holle, 2008; Haigh, 2006). Many government agencies (including independent statutory authorities such as zoos and botanical gardens) also rely on volunteers to implement certain programs and activities related to conservation and environmental management. Hence volunteers play a pivotal role in the wider industry in which students seek work upon graduation. The practicum therefore potentially contributes to students' understanding of the social and human dimensions of environmental management - how solving environmental problems is not only about understanding the science and technical aspects, but also how people and organisations work together to solve these problems (a core principle of EfS; DEWHA, 2009).

Many students have grasped the idea of volunteering from school and are familiar with the fundamental concept of volunteering being more than direct personal benefit, but also helping others and contributing to a bigger cause. The degree to which these altruistic objectives of the practicum iscurrently being evaluated and will be available in further research papers.

SCI1120 students are required to do at least 5 days which translates to 30-40 volunteer hours per student over the calendar year. On average, students do more hours than the minimum required which demonstrates a degree of commitment to volunteering and the organisations they work for. For instance, in 2010 each student averaged 60 hours of volunteering, whilst in 2012 this average was 49 hours, with several students doing more than one placement. One student did 120 volunteer hours with the community group of Lord Howe Island weed eradication program. Another student did 300 volunteer hours with RSPCA in 2010 and several students did 100+ volunteer hours for Department of Environment and Conservation (DEC) working at Monkey Mia with dolphins.

Letters and evaluations from the organisations almost always give positive feedback that students have made worthwhile contributions with a good attitude. In 2012, 55% of supervisors gave highly complementary feedback, whilst 34% were generally positive and the remaining 11% neutral (i.e. they used standard letters or certificates of acknowledgement). Organisations that rely on volunteers sometimes ask for more volunteers suggesting their experience has been positive.

Types of activities and organisations

Students tend to choose volunteer work that is related to their course. For example, biology students tend to go to zoos and veterinarians. Native animal rescue and rehabilitation centres are popular for students studying conservation and wildlife biology. Marine biology students mostly volunteer doing general tasks like restoration and rehabilitation, especially of coastal dunes, and sometimes they do survey work with government fisheries and marine organisations. Although there is considerable

flexibility in the type of experience, and this can be tailored to students' courses and aspirations, the emphasis is on volunteering with the unit outline stating that students should be working with a community group.

In 2010, 44 SCI1120 students did a total of 2659 volunteer hours across 49 placements. Most volunteered in bushland care and ecosystem restoration or wildlife care and rehabilitation (Table 1).

Table 1: Types of volunteer activities done by SCI1120 students in 2010

Types of volunteer activities	Number of hours	Number of Placements	Examples of activities
Wildlife Care and Rehabilitation	1287 (48%)	19 (39%)	Animal care and rehabilitation, assisting research, animal monitoring (e.g. turtles, birds)
Bushcare/Restoration	827 (31%)	18 (37%)	Weed control, track maintenance, planting, survey
Marine/Coastal	305 (12%)	7 (14%)	Dune rehabilitation, assisting research projects, aquaculture
Other	240 (9%)	5 (10%)	
Total	2659	49	

Altogether, in the order of 2000-4000 volunteer hours (depending on number of students enrolled) are provided annually through this first year practicum, mostly to community- and government-based environmental/conservation organisations. In 2010, half the SCI1120 students volunteered in non-government organisations (NGOs), whereas in 2012 this increased to 67%. State and local government were also popular with students as many government agencies have specific programs or activities tailored to volunteers (Table 2). Longitudinal data is being collected to investigate general trends.

Table 2: Types of organisations in which SCI1120 students volunteered in 2010

Types of Organisations	Number of hours	Number of Placements	Main organisations
NGO	1297 (49%)	22 (46%)	Conservation Volunteers (11), Kanyana Wildlife Sanctuary (4), other sanctuaries, RSPCA
State Government	526 (20%)	8 (17%)	DEC Volunteer Programs
Commercial/Industrial	336 (12%)	6 (13%)	Environmental Consultancies, plant nurseries
Community Group	260 (10%)	5 (10%)	Friends' groups, catchment groups
Research organisation	135	5	ECU, other universities
Local Government	60	2	City of Wanneroo, City of Stirling
Other	45	1	
Total	2659	48	

Older students view the practicum more strategically than the younger students in that they see it as practical work orientated to getting a paid job. Younger students see it more like volunteering with a community-based organisation. Further data gathering has been implemented to investigate these conclusions. Most commonly students work with organisations that specialise in the supply of volunteers for particular projects for local government and other organisations, particularly in environmental management and conservation. For example, Conservation Volunteers Australia (CVA) are well organised, have activities almost every day, as well as week-long programs in various parts of

the country, and focus on hands-on, restoration type work such as weed control and track maintenance. Some students tap into local community groups doing active bushland management. Volunteers are often attracted to charismatic mega-fauna (Campbell & Smith, 2005) and volunteering for wildlife sanctuaries and zoos is popular across all courses. Some wildlife sanctuaries that deal with injured animals have too many volunteers and only take students who are keen and committed to a long-term investment of themselves and their time.

Others types of organisations where students have volunteered include: 1) international organisations specialising in providing volunteers for research and conservation projects, such as Earthwatch, Projects Abroad and Raleigh International (for which there is often an associated fee and may be considered a type of volunteer tourism; (Cousins, 2007; Haigh, 2006); 2) government departments and agencies with formal volunteering programs (e.g. Kings Park and Botanic Gardens, Perth Zoo, Department of Environment and Conservation's Nearer to Nature Program); 3) environmental activist and campaigning groups (e.g. The Wilderness Society, Friends of the Earth); 4) community-based conservation groups (e.g. 'Friends' groups involved in managing local bushland reserves; and 5) universities where students assist with research projects (including helping post-graduates students). The School of Natural Sciences, specifically the coordinator of the practicum, has also organised and run ecological restoration activities for students, including propagation and planting in local bushland and elsewhere in conjunction with other organisations (e.g. dune restoration with Town of Mosman Park).

Student attitudes

Although some 90 students enrolled in SCI1120 at the start of 2012, only 34 had completed both the pre-experience and post-experience survey as of February 2013 (Table 3).

Table 3: Summary of student survey responses on how they valued their 1st year practicum experience in 2012. Numbers of responses received and mean score (0-5) are given for post-experience and pre-experience surveys (where students were asked about the anticipated benefits of the practicum). Data set is restricted to students who completed both pre- and post-surveys.

	Useful for university study		Useful to host organization		Useful for getting a job		Enjoyed the experience		The work was hard	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Extremely So (5)	14	4	11	12	3	6	8	7	20	1
Very much so (4)	15	15	15	13	4	14	16	15	10	8
Reasonably so (3)	5	13	6	9	21	12	10	9	4	15
A little (2)	0	2	2	0	5	2	0	3	0	6
Not at all (1)	0	0	0	0	1	0	0	0	0	4
No. of responses	34	34	34	34	34	34	34	34	34	34
Mean score (0-5)	4.26	3.62	4.03	4.09	3.09	3.71	3.94	3.76	4.47	2.88

Several students are yet to complete their volunteering (grade on hold), withdrew from the unit or course during the year, or did not, for a variety of reasons, complete both questionnaires. Of those responding to both surveys, the vast majority found the experience highly enjoyable and most thought they were highly valuable to their host organisation (score of 4 or above; Table 3). Although some 38% of students found the experience gave only modest value to their university studies (reasonable benefit), a higher proportion (56%) found the experience to be highly beneficial to their studies, with two students reporting no benefits (Table 3). Some 41% of responding students saw few to reasonable advantages of the experience in gaining employment (score of 2 or 3), whereas 59% believed it was highly beneficial in this area (Table 3). Compared to the anticipated benefits reported in the pre-experience survey at the start of 2012, the actual experience was less useful than expected in terms of contributing to university study, was less enjoyable than expected and the work was clearly

easier than anticipated. However, the experience exceeded expectations, on average, in terms of usefulness to organisation (slight improvement) and in perceived job prospects (Table 3). Further investigation of student attitudes is currently being implemented.

Many students responded to questions on the value of the experience with specific information on what they did and what they learnt (as opposed to more generic skills and outcomes). Most students indicated they would do more volunteer work in the future.

Although the results presented here are preliminary only, with more data to be analysed and collected, they do suggest some students are not seeing the prospective link between their experiences and their future studies at university and employment after university. This is somewhat disappointing as these form part of the stated and unstated objectives of the practicum experience. The fact that students are often doing manual and routine tasks during their volunteering (e.g. planting, weeding, feeding, cleaning) may have influenced their view of their experience and the perceived mismatch with the types of jobs they desire upon graduation (which are likely to be more professional roles). Appreciation of the importance of community-based NGO's to the environment/conservation sector was one thing we hoped students would gain from the practicum experience, and it would be interesting to also survey third-year students and recent graduates on this topic and to compare their experiences and opinions of the volunteering experience with that of the first years**.** This is also important because the first year practicum is only one component of WIL integrated into their courses. Some other objectives of the first-year practicum however are clearly being met, such as making a worthwhile to strong contribution to the organisations that students volunteer for. In this fashion, the program is also likely to contribute towards community engagement goals set by the university.

Alignment with Principles of Education for Sustainability (EfS)

Although the first year practicum with focus on volunteering is a small component of students' undergraduate degrees in natural sciences and has quite modest aims, it does introduce students to some fundamental principles and core elements of sustainability and serves as a foundation for other units in their degree which deal with sustainability issues in more detail. While alignment with sustainability principles had not previously been a purpose of this unit, it is now being investigated. How to embed students' learning of sustainability principles into this unit is another role of curriculum review and redesign but quite difficult while this unit is primarily a practicum unit with little teaching or assessment involved. Given the lack of research generally and evidence about success of alignment of sustainability principles with university studies, it seems important to provide this data, description and intention about further investigation. More specifically this unit addresses, either directly or indirectly, some of the core principles of EfS as defined by the Australian Government's National Action Plant for EfS (DEWHA, 2009: 9):

- **Transformation and Change**: EfS is seen as an extension of traditional environmental education and the simple reporting on the (often dire) state of the environment by involving and "equipping people with the skills, capacity and motivation to plan and manage change towards sustainability within an organisation, industry or community" (DEWHA, 2009: 9). By participation in a community group involved in on-the-ground environmental action, students may gain, not only some practical skills to facilitate change, but also hope that change is achievable.

- **Education for all and lifelong learning**: Students are likely to be exposed to members of their local community, from all ages and backgrounds, engaged in learning about their local environment and its management; this may open their eyes to the fact that EfS is not always a classroom activity, and that learning can occur outside the formal education sector. Further it opens the possibility of learning being a two-way and long-term process where graduates can make a positive contribute to the community group as much as they learn from the group's activities. This would be particularly so given at least some students maintain an involvement with the group or organisation.

- **Systems Thinking**: Other units in the students' degree deal specifically with notions of holism and the inter-connected and inter-disciplinary nature of sustainability. However, students completing the practicum should be more aware of the important role of community groups and volunteers in achieving sustainability outcomes.

- **Envisioning a Better Future**: Completion of the practicum is likely to expose students to range of community members with similar views on the importance of living more sustainably, as well as organisations with this ethos.

- **Critical Thinking and Reflection**: Although students are not formally assessed in the practicum unit, they are required to reflect on their experiences and its potential benefit for their future studies, careers and general well being.

- **Participation**: Some community organisations that students get involved with are engaged in high levels of public participation in environmental governance and may have joint responsibilities for management of natural areas or species.

- **Partnerships for Change**: The practicum offers opportunities for students and the university to be more engaged with community and volunteer sectors, and may help students develop professional networks upon graduation.

Summary

This paper describes first year tertiary science students doing five days of practicum via environmental volunteering and reviews the alignment of this curriculum initiative with Education for Sustainability (EfS) principles.

The university unit of study makes an important contribution as tertiary students provide substantial volunteer hours to the environment, the environment industry and organisations which are increasingly reliant on volunteers to reach their specific operational objectives, as well as to achieve broader sustainability and biodiversity conservation goals. The students' work is generally highly valued by the organisations for its quality and relevance. There is also some preliminary evidence of benefits to the students involved, including the perception by most of an improvement in employability. Overall most students found the experience to more beneficial than expected in improving their job prospects upon graduation, although it was less useful than they anticipated for their university studies. This suggests the experience may generally be more targeted towards altruism and the development of field-based skills and confidence than any major enhancement in academic understanding.

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