

Student voice in 'skills for sustainability': A missing component from the demand side of Australian Vocational Education and Training

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ABSTRACT

The implementation of the Green Skills Agreement ratified by the Council of Australian Governments (COAG) in 2010 provides the national policy context for this analysis of skills for sustainability. Data from three different but complementary studies provide powerful insight into the attitudes and perceptions of young people who are studying, or are recent graduates of, Australian Vocational Education and Training (VET) programs. We argue that the voices of the young people who participate as students are largely absent from analysis and policy-making, despite policy rhetoric about a demand driven Australian tertiary education sector responsive to consumer (student) interest and need. The combination of these three studies contributes to an improved understanding of what these young adults think and are learning with regard to skills for sustainability in their VET courses and in their workplaces. Most notably, these VET students reported that increasingly changes around skills for sustainability are being implemented into both their work roles and their courses of study.

Keywords: skills for sustainability, demand side, youth voice, green skills, vocational skills, students

INTRODUCTION

Education for sustainability has an ongoing and vital role to play in the Vocational Education and Training (VET) sector. Research by Goldney, Murphy, Fien and Kent (2007) provides an overview and a foundation for 'sustainability and VET in Australia' confirming that society is becoming more aware of environmental concerns and is looking to VET programs to provide a

means for promoting sustainability within workplaces, amongst employees and employers. The final key message from this research explained, 'if they are taught sustainability skills throughout their education, learners can develop the ability to promote these concepts in the workplace, devise and encourage sustainable work practices, and develop strategies for negotiating and justifying desirable changes with colleagues and managers'

(p. 7). Moreover, Goldney et al. recognised the ongoing value of education in underpinning further and longer-term change.

The Climate Commission, which was established to provide all Australians with an independent and reliable source of information on climate change, has consistently argued that 'this decade is critical' to incorporating sustainability into economic, social and political practice (Climate Commission, 2011a, p. 2). Such imperatives drive the call for society to transition to a low carbon economy (Garnaut, 2011; Stern, 2007). These calls for change are premised on the argument that the longer we wait, the more difficult and costly sustainable development becomes (Climate Commission, 2011b). In September 2013, the incoming federal government dismantled the Climate Commission. Yet just a week later it was successfully re-launched as an independent non-profit organisation called the Climate Council, to be fully funded by public donation. That funding this new Council by public donation is even possible indicates that many Australians care very deeply about climate change and the environment.

A high priority amongst the strategic responses to climate change is the setting of targets for lowering carbon and pollution emissions and for increasing the use of alternative and renewable energy sources. The setting of future-orientated targets has significant implications for young people because they will be the immediate future generation to inherit the legacies of past and present industrialisation. Therefore, we argue that young people should be included in conversations concerning climate change and sustainability so that they understand their future responsibilities to achieve these targets.

In an effort to consolidate current understandings and perceptions about skills for sustainability, this article brings together the data sets from three different research studies on how young Australians (either currently studying within a VET program or having recently graduated from a VET program) perceive the development of

green skills following in the wake of the Green Skills Agreement (COAG, 2010). The analysis of these three data sets presents the beginnings of a coherent view of what young people, current students and recent graduates of the VET sector think about 'skills for sustainability'.

For his part, Sack has analysed initial, longitudinal, survey data from the Dusseldorp Skills Forum 'Gen Green' surveys of 2008 and 2011. The first data set is the result of the two Gen Green surveys and the comparison study. The second data set derives from research Rodd undertook in 2010 at a metropolitan TAFE institute in Victoria, a key component of which involved a Sustainability Skills Awareness survey of 400 (then) current TAFE students. The third data set results from focus group interviews conducted by Brown with 20 VET students, including a recent 2010 graduate. These interviews/focus groups solicited the subjects' perceptions of current and future job opportunities, and their experiences of training, in relation to the perceived importance of green skills. While the three data sets were derived from different and independent studies, the collective research findings are seen as complementary. Aspects of these studies have been combined here to provide strengthened insight into VET student and graduate voices on green skills.

The Department of Education, Employment and Workplace Relations (DEEWR) in *Australian Jobs* explained that 'green skills, or skills for sustainability, are the professional and vocational skills, as well as the generic skills (such as sustainable approaches, innovation and problem solving) required for new green jobs and the greening of existing jobs across all industry sectors as a response to climate change and sustainability imperatives' (DEEWR, 2011, p. 31). Consequently, this paper also reports on the perceptions of some VET students and graduates on skill formation and work in a green economy. A recent United Nations Environment Programme (2011, p. 2) report defines a green economy as 'an economy that results in improved human well-being

and reduced inequalities over the long term, while not exposing future generations to significant environmental risks and ecological scarcities'.

A THEORETICAL FRAMEWORK: THE INCLUSION OF STUDENT VOICES WITHIN THE DEMAND SIDE OF AUSTRALIAN VET

White (2011) has stated that climate change is of particular importance to young people. The recent national survey of young Australians conducted by Mission Australia (2011) supports this claim, showing that 44.7% of the nearly 46,000 participants aged between 11 and 24 years who took part in this study identified 'the environment' as the most important issue in Australia today. This research concluded that 'as young people are likely to live longer with the consequences of current decisions about environmental issues, their concerns and opinions should inform public debate and policy-making' (p. 6). Hence, there is the need to provide avenues for the voices of young VET students to make an active contribution towards what they learn and how they perform their work. The implications for industry and for society in this regard are, we believe, potentially significant.

Billett (2000) argued that the demand side of VET needed to be expanded and include stakeholders representing industry, the enterprise, the individual learner and the regions. However, as the recent research by Golding, Lavender, Angus and Foley (2012) shows, students continue to remain outside of all and any formal VET consultation and decision-making process. In fact, it can be argued that VET derives its political power from providing qualifications and programs for qualifications that are based on what employers and industry bodies say they require and are prepared to reward. Within the sector, there is frequent, and metaphoric, reference made to the notion of 'delivery' in relation to program provision across the VET sector. This concept reflects the one-way transfer 'of what employers designate as important, timely and worthy of financial investment when acquired.

Such unidirectional 'delivery', we argue, may also be read as representative of a high-level of learner alienation from their own education and training.

Privileging the voices of employers and industry representatives is a trait of this sector of education and has been a conscious strategy as part of building a demand driven VET system. Yet following Billett (2000), we argue that students should not only have their voices heard by the sector but that the student perspective is an integral component of the demand side of vocational education and training. Consequently, this amalgam of the three recent studies on student perceptions is presented here as a contribution towards building this broader notion of VET student voice on skills for sustainability. Likewise, it also builds a case to include these voices in the demand side of VET.

METHODOLOGY

The first of the three data sets discussed in this article involves the comparative analysis of the first two Gen Green surveys conducted under the auspices of the Dusseldorp Skills Forum in 2008 and 2011. These surveys captured indicative data on young skilled people's experiences of skills relating to sustainability. On both occasions, the respondents to these questionnaires were national competitors in the WorldSkills Australia national competition. The 2008 survey had 101 respondents (DSF, 2008) and the 2011 survey returned 97 responses from young people (DSF, 2011). Most of the respondents were under 25 years of age and tended to work in computing and business, manufacturing and engineering, and/or the building and construction industries. A slight bias in male respondents occurred. The most recent survey differed slightly from the first survey, which focused on information and the experience of participants around green skills and environmental sustainability. The second survey broadened its scope, collecting information and experiences around 'skills for sustainability'. Sack was a consultant on the second of these and sub-

sequently conducted a comparative statistical analysis (DSF, 2011). Both of these surveys were conducted online using survey monkey. An invitation was sent to all the competitors in the WorldSkills National competition calling for voluntary participation (DSF, 2008; DSF, 2011; Sack, 2012).

The second data set reported in this article is drawn from the results of a survey conducted by Rodd who undertook a substantial review of the development of green skills across a Melbourne metropolitan TAFE institution. Undertaken in 2010, between the two surveys conducted by the DSF described above, this research involved a student survey undertaken as the 'Sustainability Skills Awareness' survey. The full study consisted of a review of selected teaching practices in the institute, as well as a review of the relevant training packages and units of competency taught across the institution. The research also undertook a review of other VET providers' engagement with, and teaching of, concepts underpinning sustainability and green skills as well as an analysis of the directions offered by relevant Industry Skills Councils. Only the results of the student questionnaire stage of this research are included in this article. This survey was posted to approximately 4000 students with a tenth of that number completing the questionnaire.

The third data set for analysis and discussion in this article draws on focus group interviews undertaken on the development of green skills with 20 TAFE students, including a recent graduate from across three Victorian TAFE institutes, and conducted at the end of 2011. Two of the institutes were located in metropolitan Melbourne and the other was in regional Victoria. The students who volunteered for the focus groups were a mixture of second or third year trade apprentices and full-time students completing Certificate IV, Diploma or Advanced Diploma level qualifications in a range of trades and paraprofessional disciplines. The focus groups consisted of four groups of four, one of three and one individual interview. The inter-

views were semi-structured around five key questions. The students ranged in age between 18 and 42 years. The focus group discussions were audio-recorded using a digital recorder and the interviews were fully transcribed. The transcriptions were thematically analysed.

The survey research conducted through the DSF and the TAFE institute were undertaken by experienced researchers with understanding of the NHMRC Code for the Responsible Conduct of Research and conformed to the AVETRA Code of Practice. All participants were assured of anonymity and confidentiality, and that all contributions and results would be stored securely. All participation was voluntary and occurred following active and informed consent. All recordings and transcriptions (along with the DSF 2008 and 2011 survey data sets) continue to be stored in a locked location as per the La Trobe University Ethics approval procedures and in particular applications FHEC R011/11, R054/12 and R051/13.

The data sets from the two Gen Green surveys, the student-focused Sustainability Skills Awareness survey at the TAFE institute, and the semi-structured interviews triangulate and are therefore cross-validating as they focus on the perceptions and experiences of VET students and graduates with respect to the development and use of 'skills for sustainability'. As noted, the voices of these stakeholders, so integral to the sector, are too often silent in research and policy underpinning management directions.

FINDINGS AND DISCUSSION

The 2008 and 2011 Gen Green surveys

In 2008 the Dusseldorp Skill Forum (DSF) partnered with WorldSkills Australia (WSA) to investigate and capture apprentices' and trainees' experiences of green skill training. This partnership resulted in two Gen Green surveys. The results have been summarised below to provide a foundation for the two further data sets. The first survey was focused on environmental sustainabil-

ity, while the second was broadened and drew on aspects for standard disclosure in international organisation sustainability reporting (GRI, 2006). This includes economic, environmental and social aspects which, taken together, begin to provide a snapshot of changes over time between the two surveys.

In both Gen Green surveys, the respondents identified TAFE as their main source of information about skills for sustainability. The proportion reporting this almost doubled from 2008 to 2011 (see Table 1). In 2011, respondents also identified the media as an important source for learning about sustainability. However, in 2008, a sizeable proportion reported that they were not learning about or developing green skills at all. By 2011, this proportion had halved (Table 1), while those who had not had engagement with concepts of sustainability fell to just seven per cent.

TABLE 1: SUMMARY OF APPRENTICE AND TRAINEE RESPONSES ON SOURCES OF LEARNING ABOUT SUSTAINABILITY IN THE GEN GREEN SURVEYS

Student response	2008	2011
TAFE is the main source of information about sustainability	39%	77%
Have not learned about sustainability at all	36%	19%
Green skills are part of my day-to-day course	18%	47%

One of the largest discrepancies between the results in the first and second surveys was the proportion of respondents who reported green skills as being part of their day-to-day courses (Table 1). This suggests that these skills are being integrated into existing courses rather than kept separate as optional electives or stand-alone subjects. This should be seen in perspective – respondents to the 2011 survey reported that green skills were still only available in 60% of courses including as electives, while 26% said that green skills were not offered at all in their courses.

The 2011 Gen Green survey explored the barriers to engaging with skills for sustainability with

50% of the 97 respondents identifying cost as being the biggest impediment. This had decreased from the first survey in which 67% of respondents designated financial cost as the most significant factor hindering their engagement with green technologies. In this survey, 32% of respondents cited access to green materials as a barrier to operating in a sustainable manner within their industries. This suggests that while many respondents were aware of the consumer demand for sustainable goods and services, they felt hampered from achieving these goals by a perceived lack of availability of appropriate materials. A further 10% of respondents expressed the opinion that they lacked the knowledge and availability of new products and materials, and considered this a significant impediment to operating with a sustainable consciousness. Meanwhile, 22% of the survey's respondents reported a perceived lack of interest by employers as the main barrier to the take-up and development of skills for sustainability.

This survey explored the differences in the extent to which economic, social and green skills were encountered in the jobs and courses undertaken by those surveyed. The respondents noted that in situations of both training and work 'economic skills' were 'always present' almost twice as often as green skills. Jobs were seen as providing a basis for engagement with more economic, social and green skills than were courses of study. For instance, respondents recorded that green skills were absent from 40% of courses while in only 12% of workplaces did the respondents perceive there to be no engagement whatsoever. Simply, respondents perceived 'green' and 'social' skills to be better integrated into workplaces than into courses of study. In many industries, engagement with green skills, technologies and materials varies from client to client and site to site. 'Economic skills' were considered by 82% to be always present on the job and by 76% to be integrated into the day to day of VET courses. Sixty-nine per cent of respondents cited 'social skills' as always present

on the job and 64% said that they were part of the day-to-day considerations of their courses. When it came to green skills, 46% said that they featured as routine considerations on the job, while 44% of respondents perceived 'green skills' as being always present in their courses of study. Respondents cited waste minimisation, recycling and re-using materials as the workplace practices most frequently engaged in. Sixty-two per cent of respondents recorded, 'yes, always', as the frequency with which these 'green skills' were practised. Respondents recorded avoiding hazardous and toxic materials as the second most common 'green skill' in their workplace, with 60% stating that it was always practised. Water efficiency was seen by 46% of respondents as important and 32% viewed skills associated with energy efficiency as being important in the workplace. Responses noted 'minimising transport emissions' as the least used/common green skill in the workplace, perceived as significant by only 24% of the 97 respondents.

This 2011 survey explored the respondents' motivations for learning about skills for sustainability. The responses uncovered a high level of confusion about market and educational incentives to develop and practise these skills. The apprentices and trainees clearly recognised a strong ethical imperative despite a notable lack of incentives. While there appears to be a high level of personal interest and work-related relevance for developing skills for sustainability, such personal willingness is frequently confounded by a lack of practical and theoretical guidance. An interpretation of this perceived lack of guidance suggests that confusion and uncertainty surrounds commitment to developing these skills amongst the broader community. The 2011 survey report concluded that 'apprentices' and trainees' interests in sustainability related skills are motivated by normative forces, reflecting a broad social trend amongst young people and students to engage more with sustainability. Apprentices and trainees appear to be fairly unsure of the practical benefits of applying sustainable skills' (DSF, 2011, p. 32).

Remembering that TAFE was found to be the main source of information on green skills in these DSF surveys, we now turn to report the findings of the second of the three data sets being considered in this article. The next section of this article discusses the Sustainability Skills Awareness survey conducted at a TAFE institute in metropolitan Melbourne.

The 2010 TAFE Institute based survey

Student interest in issues concerned with strengthening sustainability at a Melbourne metropolitan TAFE institute was gauged through the formulation of a questionnaire, devised to survey a broad range of students currently enrolled. The questionnaire was sent electronically to students enrolled in 2010 as determined by the SMART student record system. The weight of the resulting 400 responses came from those who were undertaking Certificate III, IV and Diploma level courses, accounting for a total of 71.5% of the respondents. There was a commensurate breadth to the areas of study that the responding students were engaged in, representing the variety of subject areas offered at the institute. Importantly, the survey represented the views of respondents from all teaching centres with students enrolled in courses spanning the Victorian Certificate of Education, the trades – from automotive mechanics through to hairdressing and beauty – business studies, information and communication technologies, hospitality, the sciences, health and community services, and creative industries.

This survey asked students to rate issues relating to the theme of the significance of sustainability to them personally and in their prospective careers in the future using a Likert scale. They were also asked to consider statements indicating the institute's commitment to sustainability as demonstrated through organisational and educational indicators of green awareness. The overwhelming results of the survey augur strongly for a perceived importance of sustainability, with 94.5% of respondents citing that they either 'agree' or 'strongly agree' with the statement, 'sus-

tainability is important to me'. Similar levels of consensus resulted from the responses to the statements, 'sustainability is important to my area of study' (82.3%) and 'having skills that promote sustainability will be increasingly important for the Australian economy into the future' (92.2%). The surveyed students were then asked to respond to statements concerning more specific aspects of their learning experience at the institute. Overall, these statements yielded lower levels of agreement. When asked to rate their level of agreement with the statement, 'teachers at this TAFE institute demonstrate an interest in, and knowledge of, sustainability through their teaching', students replied with an aggregate percentage of 67.2% indicating agreement or strong agreement. Similarly, students' responses indicated high levels of consensus when asked to consider the statement, 'sustainability should be taught in all courses at the institute' (74.5%).

As demonstrated by the survey results, the vast majority of responses indicated strong support towards a belief in the importance of sustainability. There was, however, a notable point of departure in responses from the overwhelming trend towards agreement with the statements. When asked to consider the statement, 'my course at this TAFE institute has taught me about green skills', 63% of students replied that they either strongly disagreed (15.8%) or disagreed (47.2%), while just less than four per cent of students replied that they strongly agreed with the assertion. Reinforcing this point indicating a relatively low level of perceived 'greenness' to the courses taught, students responded with relatively high levels of agreement with the statement, 'I would like to see more teaching about sustainability in my course at this TAFE institute' (68.7%). Responses to the statement asking students to consider their impressions of the organisational commitment to being a 'green' institution indicated the level of overall agreement level of 59.2% with the claim that 'this TAFE institute models, promotes and generally encourages sustainability well'.

The conclusion that may be drawn from these data is that sustainability is worthwhile and should be considered of importance to this TAFE institute. Another of the key findings of this study is that green skills must be 'built in' and not merely 'bolted on'. To this end, sustainability within teaching practices and skill formation needs also to be part of every institute employee's work, wherever and whenever appropriate. The obvious complement to this is that an ongoing commitment needs to be made by the institute leaders and managers to the importance of Continuing Professional Development for all staff on the evolving knowledge around effecting improved sustainability. This survey did not allow for in-depth analysis of responses, nor did it provide respondents with an opportunity for free-structured and elaborated answers to the questions asked. The format required only that students indicate their relative level of agreement with a series of simple statements. This methodology prevents any further information, or broader, more detailed explanation from being given to allow students to account for the logic underwriting their responses. Interpretation of the results, therefore, must be limited to a statistical analysis of the collected data. However, more in-depth and useful data can be found within the focus group interviews conducted in 2011 across three different Victorian TAFE institutes and presented below as the third data set analysed in this article.

The 2011 focus group interviews with VET students and a recent VET graduate

This section reports the findings from the focus group interviews with 19 TAFE students, and an individual interview with a young VET graduate. The interview questions focused on how jobs might be changing now and into the future to accommodate the development of green skills and how VET courses are addressing this area of skill development.

The first focus group consisted of three young men studying full-time and undertaking a program

which led to a qualification in Conservation and Land Management in a regional TAFE institute. Significantly, their course of study included and integrated the full requirements for the Diploma of Sustainability. These students were very well informed and able to articulate strong arguments for the need for communities and individuals to live more sustainably. In response to a question about the need for work and jobs to change and become more sustainable, all three agreed that changes needed to occur. One said that 'some industries might have to incur quite a hefty change of jobs in the coming years and other industries may be less affected'. Another thought that some industries in particular would need to change. One of these students cited the oil, coal and heavy industries as ones that he thought needed to change. Another student added water to this list and made reference to the draft plan for the Murray Darling Basin. Another student in this focus group explained the complexities of this debate, stating that a balance needed to be implemented between the social, economic and environmental considerations using 'a triple bottom line' approach.

Building on this perspective about the growing need for a holistic approach to work practices and industry responsibilities, one of the students suggested that 'every business, in some shape or form, is going to have to have a look at how they operate'. All three of the students were aware that in some ways they were being trained to work in an emerging field and in jobs that were undergoing, indeed dependent on, social, economic and political change. This created uncertainty and risk for these students. One explained that he had taken two years off from work to undertake this course as a full-time student. He was hoping that this investment on his part would set him up well to gain employment in some of these emerging jobs. He believed that having the ability to adapt and manage change will be key skills required and prized/rewarded in these developing jobs into the future. Another student spoke of the need to understand more than one specifically-defined discipline/theoretical/skill area. This student

spoke of his expectation that some of the emerging jobs would require a more complex and multi-disciplinary or multi-skilled understanding in two or even three different areas. Insightfully, he described the work of managing and researching freshwater fauna and habitats as an example. As he explained, 'you have to have a pretty good idea of the plant side of things, the water quality, as well as the fish and animals within it, just to cover it as a whole'. These comments show the need to understand integrated systems.

The second focus group that participated from this regional TAFE institute consisted of four students studying in the discipline/skill area of electronics. These students had also begun to witness the immediate impact and effects of changes to their work, and to their jobs personally, due to increased community awareness of sustainability and the development of green skills. One explained how his employer pursues a double agenda of efficiency (waste and materials reduction) and lower costs as part of developing more sustainable work practices. These students reported that sustainability and green skills were being incorporated into their courses of study through appropriate core and elective units. They also explained that they had had some involvement in an institute project to build and maintain a portable alternative energy trailer. The trailer is used extensively to demonstrate to community groups the potential uses of solar and wind power to run common household audio-visual and communication equipment in off-the-grid systems. This open display of green skills and technology is used to showcase the contemporary standing of the institute on the one hand and acts as a marketing tool on the other.

Another focus group was conducted at a Green Skills Centre at a Melbourne metropolitan TAFE institute with four students undertaking a Certificate IV in Renewable Energy on a full-time basis. Not surprisingly, these students reported a high level of interest in sustainability and were studying to set up career changes in this emerging field. These participants felt that they were taking risks, as they perceived no current direct work-

place outcome or career path in this type of work. As one participant explained, 'I think the industry is still defining where it is going, its direction, what its areas of expertise are going to be and basically how that is going to be defined'. These participants believed that currently there are possible opportunities for them to work for themselves as consultants who sift and sort the plethora of information and specifications that are available for products, materials and services associated with renewable energy. Likewise, they stated that they thought that opportunities were starting to open up to work as dedicated sustainability officers in medium and/or large sized companies – also providing this sorting, planning and advising role. Sustainable building design was put forward as an option where work opportunities might also open up for them in the future.

These TAFE students described their course as being very broad in academic scope and content. Consequently, they perceived a need for them actively to design their own job and carve out their place in the workforce utilising their new skills. One participant noted, 'I can see that, one day, this course will lead to a defined job but that job is not out there yet. There are a lot of different industries that need to take up sustainability in general, but there is no defined career path at the moment'. These students acknowledged that due to building regulations and licensing they are less likely to be installing renewable energy. They explained that it is interesting that the electricians and plumbers are allowed to do this installation work, yet few have the knowledge that they have developed in their program, so while well trained and knowledgeable in this area, they are not allowed to utilise fully these skills in this highly regulated industry. Accordingly, they saw their own career possibilities as being associated more with the planning and design aspects of this work.

A focus group of four apprentices representing cabinetmaking, carpentry, boat building and bricklaying trades at a different metropolitan TAFE institution reported variation in their degree of exposure to the use of green skills at

work and in their courses. Initially the cabinet-making apprentice spoke of not seeing any changes to accommodate green skills or the natural environment, though as the interview progressed and others shared ideas and examples, he became much more aware of changes in his own job. He went on to offer the example of the use of Medium Density Fibreboard as a building material, explaining that he had to take special precautions when working with it. This is a material, he noted, that causes a cancerous dust that is highly dangerous if inhaled. He went on to describe how this material has been banned in some parts of the United States, but not here in Australia.

The boat builder was a mature-age apprentice. He reported witnessing an array of changes and considerations in his work that were related to the development of green skills in his trade. These included increasing precautions around the use of solvents, particularly in the construction and repair of fibreglass boats. As a consequence, changes were occurring to the moulding techniques and in the reduction of emissions. During the course of the focus group discussion, he shared observations of social changes occurring beyond the confines of his own industry, describing the increased use of insulation in house construction and the increasing number of houses with solar panels. He thought that these tendencies would continue to increase in the future. The other apprentices in the group agreed. Such observations suggest that an increasing awareness of broader social and environmental trends have ramifications for trade practices within specific industries.

Interestingly, the bricklayer said that he had never been to see where the bricks were made and had read little about it in the literature provided through his course at TAFE. This suggested that some work could be included into the course on product life-cycles. The boat builder said that there were whole units in his course about working in marine environments, and taking precautions not to pour any chemicals or waste into the water or marine environments. The carpenter spoke about a unit of study that his class had to

take on the computer. They were required to go online and answer an extensive list of questions. The program then added up all these lifestyle choices and provided an estimate of how much energy and resources were needed to sustain these behaviours – the carbon footprint. Feedback was given in how many worlds were needed to supply the energy and resources. These students summed up their thoughts by saying that there was a much more entrenched emphasis on occupational health and safety issues than on green skills in both their TAFE courses and in their experiences of workplaces in their industries.

A final focus group of four apprentices, comprising two students studying plumbing, one training to be a sign writer and the other learning painting and decorating, was convened at a another metropolitan TAFE campus. One of the plumbing apprentices described the use of new materials such as black polyethylene pipe now becoming more common in his industry. This new material is much easier to work with than the copper piping traditionally used in this trade, and is more environmentally friendly than its predecessor. This young apprentice described having been taught about new materials such as polyethylene in the context of green skills through his TAFE course. He continued to say that his main focus is usually on how to use and install such a product and much less about why it was being introduced. The other plumbing apprentice of this group was mostly involved in roof plumbing. She had not heard much about sustainability or green skills in her job or during her time at TAFE.

The painter and sign writer both spoke about attempts to reduce the use of oil-based paints along with the use of mineral turpentine ('turps') to thin it down and for cleaning up. The painter explained that they were not allowed to use oil-based paints or chemicals on most building sites. Instead, he described how the use of water-based paints in his industry was becoming much more common. This allowed for a much easier clean-up process and the use of fewer chemicals. The painter described how those working in his indus-

try were beginning to use recycling washing systems. The signwriting apprentice spoke of doing much less work on wood. She thought that this was being phased out and most of their work was now being done on panels that could be recycled.

The subject of the final interview was a VET graduate who had recently completed her apprenticeship as a fitter and turner and had extended this basic trade training to become a plant operator at a large energy company in the Latrobe Valley. As an operator she worked shifts, spending about 15% of her time at work participating in ongoing structured training. She reported that issues of occupational health and safety (OH&S) are a major concern at her workplace and that a great deal of effort has been put into moving beyond basic compliance standards of operation. She noted that reducing and reporting the incidents of spills, along with reducing energy consumption, are often emphasised by those in charge of OH&S policy and practice. She described how her colleagues were being asked to contribute ideas for improving the workplace through a reward system. Interestingly, she noted that she had never heard the term 'sustainability', or reference to the goal of 'improving and developing green skills'.

CONCLUSIONS

This article provides insight into what young VET students and recent graduates think about 'skills for sustainability'. Development of these skills in places of training, and take-up of these skills in workplaces, appear to have increased between the first study in 2008 and the third in 2011. Respondents perceived that skills for sustainability have been incorporated into and across a majority of VET courses, as either specialist electives or as core units. This suggests that the teaching and studying of these skills is becoming increasingly well integrated into, and across, existing TAFE programs in line with the objectives of the national Green Skills Agreement. Some students interviewed in the course of our research likened the implementation of skills for sustainability to the take-up of OH&S where, while one person

might have direct and overall responsibility, successful implementation needs to be part of everyone's workplace responsibility. However, there remains a significant demand for the continued adoption and adaptation of green skills into VET courses. As illustrated through the data collected in our research, fewer than half of the respondents to the 2011 Gen Green survey reported green skills becoming part of their day-to-day training. The focus group data reinforce this finding, suggesting that a high degree of variation still exists around skills for sustainability and knowledge of the 'green economy'. Some students had completed units of work that aimed to assess their personal carbon footprint. Other students remained unaware of material production requirements and product life-cycles, both concepts being theoretical and practical foundational knowledge underpinning the performance of trades in any industry.

The Gen Green surveys uncovered a consistently high level of interest in skills for sustainability amongst respondents. Similarly, almost all of the TAFE students who responded to the Sustainability Skills Awareness survey, and all those interviewed in focus groups, expressed optimism about the future and about further developments in this area of skill development. Some respondents suggested that most existing jobs needed to change significantly in order to incorporate the development of green skills. Some interviewees were studying for career changes and felt that they were training for emerging jobs and careers that were not yet clearly defined. Yet despite this, and importantly, they remained committed to training in this area. These results support the Gen Green findings that there is a broad commitment to developing skills for sustainability amongst apprentices and trainees, but a lack of guidance on how, and no clear incentives on where, to employ these skills. These young people, through their positive, value-laden commitment to developing these skills, are training for jobs that they think *should* exist.

National and state policy around the provision of VET currently focuses on demand-side needs in

order to enhance skill relevance, quality and efficiency. As such, a key input into any economic model for skills for sustainability is demand, both from individuals and employers. Demand-side planning of VET has historically given voice to industry and, more recently, to regional and enterprise skills needs. This demand is typically analysed as being 'top down', using macro-economic data, and 'bottom up', drawing on qualitative research inputs, like the Industry Skills Councils' annual environment scans. Recent state government VET reforms now also give some scope for individual learners to express their 'demand-side' preferences through their decisions to enrol and withdraw from courses and thus indirectly control the government allocation of funding. VET students now routinely provide feedback directly to VET practitioners and providers through course evaluations and satisfaction surveys. While ostensibly the objective of such evaluations aims to gauge and maintain the quality of training provision, they are increasingly interpreted as markers of consumer sentiment in a market-driven education system. In practice, however, such surveys serve only to provide assessment validation rather than any fundamental analysis and review of training needs. The three strands of research discussed here indicate that these demand-side drivers can be usefully supplemented by effectively listening to, and engaging with, a collective youth/student voice on sustainability skills.

The research drawn together in this article indicates that young skilled people are experiencing a failure of markets to account for unsustainable externalities (like human-caused pollution), a failure that Stern (2007) and many others have identified. Such a pronounced market failure suggests the need for intervention. For the VET sector, this could require deviating from the current system of skill formation, guided and driven by existing labour market demand, with the content of training packages devoid of student input. Instead, VET program developers could draw on the motivations of future labour market participants for its direction. In this scenario, as our

research suggests, 'skills for sustainability' should become a built-in aspect of all VET courses.

This article provides strong, if preliminary, evidence that young people participating in the VET system are calling for sustainability to be implemented more systemically within all VET programs. The students given voice through our research view the principles of sustainability as providing a theory through which a currently unsustainable economy and society might begin to correct themselves. The Gen Green findings indicate that students are increasingly drawing on a wide variety of sources beyond their VET courses, including workplaces, to inform their views on skills for sustainability. These findings are reinforced by the focus group data which indicate that some students see their employers as implementing efficiency to save on costs and otherwise change work practices to make them more sustainable. Harnessing this future pool of knowledge, for instance through a more learner-centred approach to the process of skill formation, provides an opportunity to introduce rapidly new approaches, products and materials to large cohorts of apprentices, trainees and students through TAFE institutes, introducing more sustainable work practices into the labour market.

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