

2009

Environmental Education in Small Business: The Owner-Manager's Perspective

Janice Redmond
Edith Cowan University

Elizabeth Walker
Edith Cowan University

[10.1017/S0814062600000458](https://doi.org/10.1017/S0814062600000458)

This article was originally published as: Redmond, J. and Walker, E. (2009). Environmental education in small business: The owner-manager's perspective. *Australian Journal of Environmental Education*, vol. 25, 2009. Original article available [here](#). This version is free to view and download for private research and study only. Not for re-distribution, re-sale or use in derivative works. © Australian Journal of Environmental Education.

This Journal Article is posted at Research Online.

<http://ro.ecu.edu.au/ecuworks/363>

Environmental education in small business: The owner-manager's perspective.

Dr Janice Redmond

Edith Cowan University

270 Joondalup Drive,

Joondalup WA 2027

Email: j.redmond@ecu.edu.au; Phone: 6304 2153

Professor Elizabeth Walker

Edith Cowan University

270 Joondalup Drive,

Joondalup WA 2027

Email: elizabeth.walker@ecu.edu.au; Phone: 6304 5282

Environmental education in small business: The owner-manager's perspective.

Abstract

Traditionally, environmental education has been aimed at the community or in primary schools and governmental pressure to reduce environmental damage has focussed on large businesses. More recently, the role and importance of small business and how to engage them in the environmental debate has come under scrutiny. Researchers have identified education as one method of increasing the understanding of small business owner-managers' role and knowledge of practices that, when implemented, will reduce the negative impacts of their businesses. However, there is little attention given in the literature to the perspective of the small business owner-manager and environmental education. This research was conducted to fill this gap. Results confirm that there is limited environmental education for small businesses and that there is a disconnect in meeting the needs of such a disparate group. Six elements were identified by the small business owner-managers in the design of environmental education for them: use of plain language, provision of best practice examples, industry specific information, solutions for immediate improvement, practical content and use of trusted sources to deliver the program. As Tilley (1999, p.347) so aptly stated, although "the relationship between small business and the environment is complex ... neglect the small firm at your peril".

Word count: (including references, excluding tables) 5280

Keywords: environmental management, environmental engagement, environmental drivers, environmental knowledge, empirical research, small business owner managers, training.

Introduction

Environmental education, according to Gough (1997), began in the 1960s as a response to concern about environmental degradation and focussed on creating public awareness. By 1966, the focus turned to the next generation, with emphasis placed on school and university curriculum that introduced ecological content. Environmental education took a new direction in the 1980s and looked toward sustainable development, and this term has since been taken as a slogan by key stakeholders, including industry.

Over time, many large businesses have taken steps to reduce pollution and environmentally harmful work practices however, whereas those in small businesses continue to be generally unaware of the impact of the business on the environment or the need to address pertinent environmental issues (Melton & Tinsley, 1999). Williamson and Lynch-Wood (2001) suggest that some small businesses consider themselves to have an awareness of environmental issues, however, other research has shown that many small businesses consider the environment to be a ‘peripheral’ rather than core business issue and that they do not perceive that they have a significant impact on the environment (Peters & Turner, 2004; Redmond, Walker & Wang, 2008). This is a serious issue as it indicates that small businesses are not yet engaged in the environmental debate, despite all the global political attention environmental issues are receiving. It would appear that small businesses are continuing to ‘fly under the radar’ when it comes to them being actively engaged in the debate regarding the need for them to change any poor environmental behaviour in their businesses or in affirmative action (Walker, Redmond & Goeft, 2007).

Jenkins (2004 cited in Roberts, Lawson & Nicholls, 2006) suggested that while small businesses are often viewed as the problem as they fail to engage in corporate social responsibility activities, it may be that the difficulty lies in the failure of governments to actively engage with small businesses. The truth may lie somewhere in between. It could be that small businesses do not understand their role in the environmental agenda as Madden and Scaife (2006, p. 5) found that small businesses “generally believed they lacked an overall vision or purpose for their community involvement and what it could

achieve for their business”. If this is the case, education will be vital to change this situation.

Education as a driver of small business environmental behaviour

Environmental education objectives remain embedded in major global policy documents and there is a tendency to direct resources toward school-based education (Blair, 2008). Early approaches to inspiring environmentally friendly practices involved the use of shock tactics (e.g. devastating environmental disasters) to highlight the impact that society was having on the natural world, however this strategy has thus far proven to be relatively ineffective in its aim (Kuhtz, 2007). Therefore, to achieve a more appropriate response, particularly from small business, other more direct interventions are being targeted.

The existing worldwide literature suggests that considerable effort has been made to determine the best way to engage small businesses in environmental management (Condon, 2004; Revell & Rutherford, 2003). Although few programs exist (Thomas, Jennings & Lloyd, 2008), researchers have given support for the use of education as a key strategy to engage small business in environmental management practices (Condon, 2004; Hilton, 2001; Katos & Nathan, 2004; Tilbury, Adams, & Keogh, 2005; Tilley, 1999). For example, Tilbury, *et al.*, (2005, p.8) acknowledged the important role of education, “*Sustainability is not a destination for business organisations to reach, but an ongoing learning process. Educators need to build the capacity of business and industry to address sustainability issues at a more systemic level, and to collaborate with multiple stakeholders for their resolution.*”

There is some evidence that this view aligns with the views of small business in that a recent study has shown that small business owner-managers support education as the best strategy to reduce negative environmental impacts from within the sector (Walker, Redmond, & Goeft, 2007). Paradoxically, it is also known that small businesses owner-managers are usually wary of formal education and training (Billett, 2001; Matlay, 2000), are less likely to train staff than large businesses (Bryan, 2006) and view training of any sort as a cost and not an investment (Webster, Walker, & Brown, 2005). Small business owner-managers face

time and cost issues as well as the preference for applied, just-in-time and experiential learning as they tend to use a reactive management style that is focussed on day-to-day operational matters (Dawe & Nguyen, 2007; Webster, Walker, & Brown, 2005; Webster, Walker & Barrett, 2005). Moreover, environmental management education aimed at small businesses has been criticised for lacking specificity, the use of inappropriate language and as being too difficult to access (The National Centre for Business and Sustainability, 2006; Tilbury *et al.*, 2005). Therefore, it is important to obtain the perspective of those in small business on ways to enhance the opportunity to provide environmental education into their businesses to achieve reductions in environmental harm.

Small business and environmental engagement

Small business' engagement in environmental management practices is vital (Leutkenhorst, 2004; Naffziger, Almed, & Montagno 2003) as it is currently estimated that small businesses are contributing up to 70% of global pollution (Stokes, Chen, & Revell, 2007; Hillary, 2000). Yet many small businesses have not engaged (Bradford & Fraser, 2008; Gadenne, Kennedy & McKeiver, 2008), or only do so to the extent of compliance (Revell & Blackburn, 2004). For example, only 25% of Australian companies have attempted to save water, and only 10% know how much greenhouse gas they are producing (The Australian Industry Group, 2007). Part of the reason for this lack of engagement is that they have low levels of 'eco-literacy' (Gerstenfeld & Roberts, 2000). The reasons for the low level of environmental management engagement by the small business sector cannot be ignored as these businesses are vital to the economy and to social outcomes.

The economic and social importance of small business is demonstrated by their number and employment capacity in major industrialised nations (Halley & Guilhorn, 1996; Storey, 2004). In Australia 96% of all businesses are small businesses, the definition of small business being a business that employs 20 or less staff (Australian Bureau of Statistics, 2005). These small businesses account for 47% of private sector non agricultural employment (Australian Bureau of Statistics, 2005) and cover all industry sectors.

However small businesses are a disparate group and they do not think as a collective and they often work in isolation. This isolation makes it easier for them to ignore the individual impact they may be making on the environment, yet it is estimated that they are collectively contributing a considerable ecological footprint (Stokes, *et al.*, 2007; Hillary, 2000; Walker, Redmond, & Goeft, 2007). A number of strategies that have been found to be effective in reaching and influencing small businesses towards positive environmental activity have been identified (Condon, 2004; Roberts *et al.*, 2006). These include: on-site visits, face-to-face advice, networking with those valued and trusted, and the establishment of meaningful relationships between academics and the small business enabling collaborative work toward a common goal.

While the number of studies on environmental management in small business is increasing (Aragón-Correa, Hurtade-Torres, Sharma & Garcia-Morales, 2008; Bradford & Fraser, 2008; Gadenne, *et al.*, 2008; Mir 2008; Redmond *et al.*, 2008), little is known about their business-specific environmental education needs. Indeed, the Australian Federal Government has recommended that research should be undertaken to “*encourage corporate organisations to engage in dialogue with stakeholders to determine their own learning for sustainability needs*” (Tilbury, *et al.*, 2005). By obtaining small business owner-managers’ perspective on the environmental education needs in small business, this current study will help improve the understanding of factors related to the design and delivery of environmental education programs for this sector by ensuring that the content is more relevant and able to attract participation.

Approaches to environmental education

A review of the environmental education literature shows that there are several different points of view about which educational approach is most appropriate to deliver environmental education (i.e. evolutionary/cognitive/motivational approach (Kaplan, 2000); mixed method approaches (Fien, 2000); participative problem solving approach (Walker, 1995, 1997); or positivist, expert controlled awareness raising (McKenzie-Mohr & Smith, 1999; transdisciplinary approach (Tilbury *et al.*, 2000). In the small business environmental literature a mixed method approach (e.g. combined use of financial incentives/disincentives,

compulsory regulation, education and voluntary initiatives) has been suggested (Parker, Redmond & Simpson, 2008). However, a problem-solving approach (Walker, 1995; 1997) seems to have some general applicability here in that it suggests that the educator works with business personnel to address sustainability issues that they want to address and then builds their capacity to take action. The problem-solving approach appears to cater for three important factors in engaging small business owner-managers in education. First, it allows for the diversity of small business needs by working with the business personnel. Second, it offers practical advice and information, which is of importance to resource poor small business owner-managers. Finally, it incorporates an element of ‘handholding’ that small business research has indicated as necessary to achieve engagement by small business in environmental management (Friedman & Miles, 2002; Yap & Thong, 1997). In this paper we attempt to identify what small business owner-managers would like their environmental education to look like rather than telling them what they want and need to do.

Method

Aim

To identify small business environmental education needs from the perspective of the owner-managers.

Research Questions

Three research questions were developed for this research to fill gaps in the current literature of the environmental education needs of small business from the perspective of the owner-manager:

1. What environmental knowledge do small business owner-manager’s possess?
2. What environmental training do small businesses currently need?
3. What are the elements that should be included in small business training?

Design

Ethical clearance for this study was granted by the University ethics committee and at all stages of the research the guidelines were adhered to and the small business owner-managers were assured of confidentiality of the information they provided. A quantitative research

design was used to survey the small business owner-managers. The use of surveys is both valid when conducting exploratory investigations and as small businesses are heterogeneous this method was also appropriate to elicit meaningful, intra comparable information (Fowler 1995). The main database for the survey was derived from the Australia Post delivery point methodology which allowed access to the mail boxes of small businesses throughout Western Australia. A second database was also developed from a State based telephone business directory. These businesses were contacted by telephone prior to posting the survey to ask if they would participate.

The survey was developed based on the current literature and adhered to the protocols outlined in Patton (2002). The survey collected data on the characteristics of the business (e.g. number of employees, type of business) the owner-manager (e.g. age, education, gender), and small business owner-managers' current environmental management knowledge and training in key topic areas that are relevant to businesses of this size (e.g. air pollution control, environmental law, waste and recycling), specific needs for environmental training (e.g. energy efficiency, noise pollution, wastewater management), and individual teaching and learning strategies to include in environmental management training (e.g. best practice examples, case studies, guest speakers).

Sample

A purposive sample of owner-managers of small businesses was established using an unaddressed mail method. Postal surveys were sent by mail to 2100 small businesses. A poor initial survey response rate of 3% was achieved using this method (retail $n=24$, service $n=17$, manufacturing $n=6$, construction $n=4$, food $n=4$, other $n=7$; total $n=62$). Therefore, an additional 100 surveys were sent to businesses from the printing and motor trades that had agreed by phone to complete the surveys. These industries were chosen as both have had considerable attention given to them on environmental management practices. Although the response rate was improved ($n=16$ printing and $n=13$ mechanical, $rr = 29\%$) the underlying message is that engaging small businesses on the environment is a very difficult task, even when their input is agreed. This poor response rate highlights again that small business owner-managers are not engaged in the environmental debate and a convincing business

case has not been developed for them. The marketing maxim “what’s in it for me” applies here. However, the total number of surveys did provide sufficient numerical strength ($n = 91$) for analysis given due caution in the interpretation of the data.

Data Analysis

Data analysis was completed utilising quantitative techniques in SPSS (v15) by following the tenets of major statistical theorists (Nunally & Bernstein, 1994; Ullman, 1996). Analyses were completed using frequencies and ranking the results accordingly.

Results

Research Questions

1. What environmental knowledge do small business owner-manager’s possess?

To determine whether the owner-manager had acquired environmental management knowledge via training they were first asked: *Have you had any specific environmental management practice training?* The results show that a significant majority of the owner-managers had no practical training in environmental management practices (87%). However, of those that responded no, when asked: *Would this type of training be useful?* The majority (60%) indicated that environmental management training would be useful.

To gain an insight into the owner-manager’s personal knowledge and understanding of environmental management, 14 topics relevant to environmental protection and good business practice were listed and the owner-managers were asked to record their current level of knowledge on a simple 4 point scale ranging from poor, fair, good to excellent. Overall, the responses indicated that most believed themselves to have a fair to good knowledge of these issues. When grouped together to ascertain the difference between poor and fair knowledge versus good or excellent knowledge, gaps in the owner-managers’ current knowledge became evident. Figures in Table 1 show that when put into a ranked order from area of least to greatest knowledge, five areas had a majority of owner-managers that perceived they only had a poor to fair knowledge. These areas were: environmental law, cost benefit analysis, environmental planning, biodegradable materials and air pollution control.

Insert Table 1 here

2. *What environmental training do small businesses currently need?*

As well as looking at current knowledge, the owner-managers were also asked to indicate the knowledge components which they would like to be included in any environmental management training for small business. The results are presented in Table 2. Despite the indication that training would be helpful to their business and a reported lack of knowledge indicated in at least five key environmental areas, in general, the options that were presented to the businesses were not seen by the majority as beneficial to business, and as they are not educators it was not surprising that no alternative training or information areas were suggested by the owner-managers. The only area where there was majority agreement that training in the area would be useful was in waste and recycling. Other priorities included energy efficiency, cost benefit analysis and the role of small business in environmental management.

Insert Table 2 here

3. *What are the elements that should be included in small business training?*

To determine the elements small business owner-managers see as necessary to encourage attendance at training by those in their businesses a list of 18 possible elements was provided and the option to offer others (4% offered other elements). The owner-managers were asked to indicate all items that they considered would encourage attendance (i.e. *Attendance at training for those in my small business requires the following elements to be included*). The results that are presented in Table 3 include only those that had a majority positive or negative response. The elements offered that were most strongly supported were the use of plain language, best practice examples and industry specific knowledge. Overall, there was greater consensus on the elements not to include. Those given least support by the owner-managers were: theoretical content, guest speakers, assessments, time to network, and collaboration with others.

Insert Table 3 here

To provide additional information of the small business owner-managers' preferences for delivery they were also asked to place in priority order which person, organisation or information source they would be most likely to pay attention to in regard to recommendations about environmental management practices and environmental protection in their small business. The owner-managers were provided with a list of 11 options and given the capacity to add other options. No alternatives were offered. Table 4 presents the results based on percentage of priority one scores. On this basis, the Environmental Protection Agency (WA) was the favoured source of information, followed by those within the owner-manager's business network. The source they were least likely to pay attention to was industry magazines.

Insert Table 4 here

Discussion

The results of this research show that the majority of small business owner-managers do not have any practical environmental management training, even though most consider that this type of training would be useful to them. The fact that many of them 'say' it would be useful, but most do not actually do it, is an interesting finding about the importance that small businesses actually place on environmental issues and indicates that it simply remains on the 'things to do list', well below other core business functions. This aligns with previous research that small business owner-managers are reluctant to attend training (Billett, 2001; Matlay, 2000).

The five areas where small business owner-managers were found to have relatively poor knowledge (i.e. environmental law, cost benefit analysis, environmental planning, biodegradable materials and air pollution) highlight some of the reasons why businesses are having difficulty engaging in better environmental management practices (i.e. if they do not know what the regulations are, how can they implement practices to adhere to them? If they don't understand environmental planning, how can they plan for the environment? If they do not know how to calculate the cost benefits of implementation, how can they see where the competitive advantages might be?). This research confirms the importance of particularly

the first three of these areas (i.e. environmental law, cost benefit analysis, environmental planning), as these have been identified in earlier research in the UK and the Netherlands (Hilton, Archer & van Nierop, 2000) and Spain (Colquell-Bellster, Monerde-Diaz, Colquell-Bellster & Torres-Sibille, 2008) as key areas for small business environmental training.

Out of 14 areas of environmental knowledge only waste and recycling were seen as valuable areas for training by the majority of the small business owner-managers. This finding has three implications. First, small business owner-managers have indicated that they want more information about practices which they are familiar with and are known to have benefits for them (i.e. financial gain and/or removal of unwanted materials that they cannot afford to store), and this finding suggests that if stakeholders continue to introduce other environmental practices to them and show them to be of value, they will continue to engage and want to improve their knowledge and performance. The second implication is that demonstrated successful results achieved through engagement in waste and recycling may need to be used as leverage to entice small business owner-mangers into other types of environmental training. Finally, as there was no other identified training area that clearly interested the majority of the small business owner-managers, stakeholders (e.g. registered training organisations, small business centres, governments) may need to offer a range of shorter training modules, rather than a program that has a single focus, to attract sufficient participation. As stakeholders have been found to influence decision making and environmental actions taken in small businesses it will be important to include them both at an early stage of program development to ensure their needs are met (Madsen & Ulhoi, 2001).

Other areas where there was some agreement that training would be valuable were related to energy efficiency, cost benefit analysis and the role of small business in environmental management. Energy efficiency is an area that has three important elements to attract small business attention: (a) cost savings can be made from changes in the business; (b) awareness has been created in this area by both media and government; and (c) it is a practical element of environmental management that small businesses can and do engage in. Therefore, it is

possible that energy efficiency will be an area like waste and recycling that will continue to see small business owner-managers look for more information and implement new practices. However, the need for training about the role of small business clearly shows that many small businesses do not know what to do and are concerned about doing the wrong thing (Roberts *et al.*, 2006). While this may seem a trivial matter, it is not, and should be addressed in future training programs and clearly understood by both small business and other stakeholders.

To attract participants the following five elements were not recommended for inclusion in a small business environmental education program:

- Theory;
- Assessments;
- Time to network;
- Time to collaboration with others;
- Guest speakers.

Intuitively, not requiring theoretical content is consistent with small business practical/operational focus. The finding on assessments is also consistent with adult and community based learning principles that suggest small business learning should not be linked to formal outcomes (Redmond & Walker, 2008). The lack of support among the owner-managers for time to network, collaborate or listen to guest speakers in training programs was surprising given that many successful small business programs are based on these elements. On reflection, it was considered that this result may have been based on the owner-manager's premise that attendance at training by those in their small business did not necessarily require these elements to be included as learning could be achieved without them. However, further research may be required to verify the cognition behind this result.

In summary, environmental education for small businesses should be delivered with the following six elements in mind:

- Use of plain language;
- Provision of best practice examples;

- Offer industry specific information;
- Offer solutions for immediate implementation;
- Offer practical content; and
- Use trusted sources to deliver the program.

This content and delivery style is consistent with other research that has looked at small businesses reluctance to train (Billett, 2001; Redmond & Walker 2008; Walker, Redmond, Webster & Le Clus, 2007). This is also indicative of a problem-solving approach to education as outlined by Walker (1995; 1997). The small business owner-managers in this research have given a clear indication that environmental education is important to them, as is being provided with information about the content and a delivery style that the learners can relate to. Gaining the participation of small business has not proven easy and may continue to prove problematic, but it is clear from research previously conducted by the authors and other reported in the current literature that environmental education is one tool that can add value and may be best combined in an overall mixed methods approach (e.g. combined use of financial incentives/disincentives, compulsory regulation, education and voluntary initiatives) as called for by Parker, Redmond & Simpson (2009). Changes to environmental education programs that are cognisant of the small business owner-managers' perspective should be made to improve their level of relevance and increase attendance. Moreover, increased environmental education among small business owner-managers should, in turn, provide better social, economic and environmental outcomes.

Conclusion

This research has provided the broad structural changes required to transform environmental education for small business. Future research that drills down on each topic (e.g. environmental law, cost-benefit analysis and so on) to determine the components that are needed by small business within each of these will enhance specificity. Moreover, determining specific industry and local needs would be of great value.

Serious problems are raised for educators when seeking to design and deliver environmental education for small business as they are a disparate group that seek individualised and

specific attention. In this research, several key indicators of what is required have been provided by the small business owner-managers that may encourage attendance at training to improve eco-literacy and skills. This information will assist those involved in the design and delivery of environmental education to accommodate the needs of those that work in small businesses. This is not new in education, to start from the learner's point of view, but appears to have been forgotten when stakeholders have responded to the call for increased environmental education for those working in small business where in the most part content and delivery preferences have not been sought prior to implementation. Moreover, the need for future research to enhance the specificity of environmental education to this sector is important. As small businesses have such a significant impact on social, economic and environmental outcomes they must not be ignored regardless of the complexities that may be encountered in achieving their engagement.

REFERENCES

- Aragón-Correa, J.A., Hurtado-Torres N., Sharma, S., & Garcia-Morales, V.J. (2008). Environmental strategy and performance in small firms: A resource-based perspective. *Journal of Environmental Management*, 86, 88-103.
- Australian Bureau of Statistics. (2005). *Characteristics of small business (catalogue 8127.0)*. AGPS: Canberra.
- Billett, S. (2001). Increasing small business participation in VET: a hard ask. *Education + Training*, 43 (8/9), 416-425.
- Blair, M. (2008). Community environmental education as model for effective environmental programmes. *Australian Journal of Environmental Education*, 24, 45-53.
- Bradford J. & Fraser E.D.G. (2008). Local authorities, climate change and small and medium enterprises: Identifying effective policy instruments to reduce energy use and carbon emissions. *Corporate Social Responsibility and Environment Management*, 15, (3), 156-172.
- Bryan, J. (2006). Training and performance in small firms. *International Small Business Journal*, 24, (6), 635-660.
- Cloquell-Ballester, V.A., Monterde-Diaz, R., Cloquell-Ballester, V.A., & Torres-Sibille, A. (2008). Environmental education for small and medium enterprises: Methodology and e-learning experience in Valencia regions. *Journal of Environmental Management*, 8, 507-520.
- Condon, L. (2004). Sustainability and small to medium sized enterprises- How to engage them. *Australian Journal of Environmental Education*, 20, (1), 57-67.
- Dawe, S. & Nguyen, N. (2007). Education and Training that meets the needs of small business: A systematic review of research. NCVET: Australia. Available online at, <<http://www.ncver.edu.au/publications/1737.html>>.

- Fowler, F.J. Jr., (1995). *Improving survey questions: Design and evaluation*. Thousand Oaks: Sage.
- Friedman, A. L., Miles, S. (2002). SMEs and the environment: evaluating dissemination routes and handholding levels. *Business Strategy and the Environment*, 11 (5), 324-341.
- Gadenne, D.L., Kennedy, J., & McKeiver, C. (2008). An empirical study of environmental awareness and practices in SMEs'. *Journal of Business Ethics*, 23 (5), DOI 10.1007/s10551-008-9672-9.
- Gerstenfeld, A & Roberts, H. (2000). Size matters: Barriers and prospects for environmental management in small and medium enterprises. In R. Hillary (Ed.), *Small and medium sized enterprises and the environment*. (p.106-118). Sheffield, UK: Greenleaf Publishing.
- Halley, A. & Guilhorn, A. (1996). Logistics behaviour of small enterprises: performance, strategy and definition. *International Journal of Distribution and Logistics*, 27 (8), 475-495.
- Hillary, R. (2000). *Small and medium enterprises and the environment. Business Imperatives*. Sheffield, UK: Greenleaf.
- Hilton, M. (2001). *Design for sustainable development: Success factors*. Report: European Foundation for the Improvement of Living and Working Conditions. Retrieved 26 April 2007 from <http://www.eurofound.eu.int/pubdocs/2001/06/en/1/ef0106en.pdf>.
- Hilton, M., Archer, E., and van Nierop, P. (2000) *Professional Education and Training for Sustainable Development in the UK and the Netherlands: Summary*. Available online at, www.eurofound.eu.int/pubdocs/2000/68/en/1/ef0068en.pdf
- Katos, G. & Nathan, S. (2004). *SME Delivery Mechanisms - Presentation of Key Quantitative Research Insights*. Available online at, www.sustainability.vic.gov.au/resources/documents/04_sept_15_TQA_fin_report.
- Kuhtz, S. (2007). Adoption of sustainable development schemes and behaviours in Italy; Barriers and solutions - what can educators do? *International Journal of Sustainability in Higher Education*. 8(2), 155-169.
- Luetkenhorst, W. (2004). Corporate social responsibility and the development agenda, *Intereconomics*, 39 (3), 157-166.
- Madden, K. & Scaife, W. (2006). Overcoming barriers to SME community engagement. *International Council for Small Business, 51st World Conference*. Available online at, www.icsb.com.
- Madsen, H. & Ulhoi, J.P. (2001). Integrating stakeholder and environmental management. *Business Strategy and the Environment*, 10, 77-88.
- Matlay, H. (2000), Training and the small firm. In Carter, S. and Jones-Evans, D. (Eds.), *Enterprise and Small Business: Principles, Practice and Policy* (pp,3223-336), Essex, England: Pearson Education.
- Melton, K. & Tinsley, S. (1999). Outlook for greener marketing: Unsettled and cyclonic. *Eco-management and Auditing*. 6(2), 86-97.
- Mir, D.F. (2008). Environmental behaviour in Chicago automotive repair micro-enterprises (MEPs). *Business Strategy and the Environment*, 17, (3), 194-207.
- Naffziger, D.W., Ahmed, N.U., & Montagno, R.V., (2003). Perceptions of environmental consciousness in U.S. small businesses: An empirical study, *S.A.M. Advanced Management Journal*, 68 (2), 23-32.

- Nunally, J.C. & Bernstein, I.H. (1994) *Psychometric theory*. (3rd ed.). NY: McGraw-Hill.
- Patton, M.Q. (2002). *Qualitative research and evaluation methods*. (3rd ed.). Thousand Oaks, Ca: Sage.
- Parker, CM., Redmond J., & Simpson, M. (2009). A review of interventions to encourage SMEs to make environmental improvements. *Environment and Planning C: Government and Policy*, 27 (2), 279–301.
- Peters, M. & Turner, K. (2004). SME environmental attitudes and participation in local-scale voluntary initiatives: Some practical applications. *Journal of Environmental Planning and Management*. 47(3), 449-473.
- Redmond, J., & Walker, E. A. (2008). A new approach to small business training: Community based education. *Education + Training* 50 (8/9), 697-712.
- Redmond, J., Walker, E. A. & Wang, C. (2008). Issues for small businesses with waste management: Resources or attitude? *Journal of Environmental Management*, 88 (2), 275-285.
- Revell, A., & Blackburn, R. (2004). *UK SMEs and their response to environmental issues*. Small Business Research Centre, Kingston University: Surrey.
- Revell, A. & Rutherford, R. (2003). UK environmental policy and the small firm: Broadening the focus. *Business Strategy and Environment*, 12, 26-35.
- Roberts, S., Lawson, R., & Nicholls, K.(2006). Generating regional-scale improvements in SME corporate responsibility performance: Lessons from Responsibility Northwest', *Journal of Business Ethics*, 67, 275–286.
- Stokes, D., Chen, H., & Revell, A. (2007). Small businesses and the environment: turning over a new leaf? A Report for the Workspace Group PLC March 2007. Kingston University: Surrey UK.
- Storey, D. (2004). Exploring the link among small firms, between management training and firm performance: A comparison between UK and other OECD countries. *International Journal of Resource Management*, 15 (1), 112-130.
- The Australian Industry Group. (2007). *Environmental sustainability and industry. Road to a sustainable future*. September 2007: Sydney: The Australian Industry Group.
- The National Centre for Business and Sustainability. (2006). Behaviour change: A series of practical guides for policy-makers and practitioners; Number 9; *Encouraging Sustainability Amongst Small Businesses*. Available online at, www.defra.gov.uk/science/project_data/DocumentLibrary/SD14007/SD14007_351FRP.doc.
- Thomas, C., Jennings, P., & Lloyd, B. (2008). Issues in renewable energy education. *Australian Journal of Environmental Education*, 24, 67-73.
- Tilbury, D., Adams, K. & Keogh, A. (2005). A National Review of Environmental Education and its Contribution to Sustainability in Australia: Business & Industry Education. Report No.4 in a series of 5; 2005; Canberra: Australian Government Department of the Environment and Water Resources and the Australian Research Institute in Education for Sustainability (ARIES). Available online at, www.aries.mq.edu.au/project.htm.
- Tilley, F. (1999) The gap between the environmental attitudes and the environmental behaviour of small firms. *Business Strategy and the Environment* 8, 238-248.

- Ullman, J. (1996). Using multivariate statistics. In B.G. Tabachnick & L.S. Fidell (Eds). *Using Multivariate Statistics*. (3rd ed.). (pp. 709-812). NY: Harper Collins College Publishers.
- Walker, B., Redmond, J., & Goeft, U. (2007). *Final Report Bellevue Sustainable Industry Project*. Report to Swan Catchment Council, August 2007: Edith Cowan University, Perth, Western Australia.
- Walker, E. A, Redmond, J., Webster, B & Le Clus, M. (2007) Small business owners: too busy to train? *Journal of Small Business and Enterprise Development* 14 (2) 294-306.
- Webster, B.J., Walker, E.A., & Brown A. (2005). Small business participation in training activities. *Education + Training*, 47(8/9), 552-561.
- Webster, B. J., Walker, E. A., & Barrett, R. (2005) Small business and on-line training: who is willing to participate? *New Technologies Work and Employment*. 20(3), 248-258.
- Williamson, D. & Lynch-Wood, G. (2001). A new paradigm for SME environmental practice. *The TQM Magazine*. 13(6), 424-432.
- Yap, C. & Thong, J.Y.L. (1997). Programme evaluation of a government information technology programme for small business. *Journal of Informational Technology*, 12, 107-120.

Table 1. Current environmental management knowledge of the owner-managers.

In relation to your business how would you rate your current knowledge in the following areas of environmental management ... (number of answers)	Answer and frequency	Ranking Least Knowledge
Environmental Law (91)	Poor – Fair (65) Good – Excellent (26)	1
Cost-Benefit Analysis (89)	Poor – Fair (51) Good – Excellent (38)	=2
Environmental Planning (88)	Poor – Fair (56) Good – Excellent (32)	=2
Biodegradable Materials (89)	Poor – Fair (48) Good – Excellent (41)	3
Air Pollution Control (90)	Poor – Fair (46) Good – Excellent (44)	4
Noise Pollution (89)	Poor – Fair (42) Good – Excellent (47)	5
Water Pollution Control (90)	Poor – Fair (40) Good – Excellent (50)	6
Energy Efficiency (91)	Poor – Fair (37) Good – Excellent (54)	7
Chemical Control (90)	Poor – Fair (36) Good – Excellent (54)	=8
Wastewater Disposal (89)	Poor – Fair (36) Good – Excellent (53)	=8
Dangerous Goods (90)	Poor – Fair (35) Good – Excellent (57)	9
Waste/Recycle (91)	Poor – Fair (32) Good – Excellent (59)	10
Water Efficiency (90)	Poor – Fair (30) Good – Excellent (60)	11
Safety and Health (90)	Poor – Fair (20) Good – Excellent (70)	12

Table 2. Small business environmental training requirements.

What components of environmental management practice (EMP) training would currently be most suitable for <u>your</u> small business? (number of answers)	Percentage of Yes responses	Ranking
Waste and Recycling (74)	58	1
Energy efficiency (73)	44	2
Cost benefit analysis (73)	42	3
Role of small business (73)	38	4
Environmental law (73)	37	5
Water efficiency (73)	32	=6
Products and services (73)	32	=6
Chemical pollution (73)	30	7
Wastewater management (73)	29	8
Water pollution (73)	23	9
Dangerous goods (73)	25	10
Planning (73)	22	11
Air pollution (73)	19	12
Carbon Trading (73)	18	13
Noise Pollution (73)	16	14
Environmental protection (73)	15	15

Table 3. Positive and negative elements in small business training.

Attendance at training for those in my small business requires the following elements to be included (number of answers)	Percentage of Yes responses	Ranking
Most positive elements		
Plain language (83)	78	1
Best Practice Examples (83)	69	2
Industry specific (83)	68	3
Solutions for immediate implementation (83)	60	4
Practical content (83)	59	5
Most negative elements		
Theoretical content (83)	12	1
Guest speakers (83)	17	2
Assessments (83)	15	3
Time to network (83)	24	4
Collaboration with others (83)	28	5

Table 4. Trusted sources of environmental management for small business.

In <u>priority order</u> I would be most likely to pay attention to recommendations about environmental management practices and environmental protection in my small business from the following sources (Please place a number against each in order of preference)	Percentage of number one responses	Ranking
Environmental Protection Agency (WA)	18	1
My business network	15	2
Industry association	14	3
Environmental Scientist	12	=4
Trade Association	12	=4
Federal Government	11	5
Professional Environmental Consultant	10	6
State Government	7	=7
Local Government	7	=7
Small business professional	6	8
Industry magazine	2	9