The Practice of Environmental Training: A case of ISO 14001 Certified Businesses in Durban, South Africa

Dianne Sennoga and **Fathima Ahmed**, University of KwaZulu-Natal, South Africa

Abstract

Environmental management has moved from a policy concept to a proactive strategy defining business responsiveness to stakeholder and market-related pressures towards improved environmentally sustainable business practices. There is increasing business responsiveness through corporate sustainability and environmental management practices. A growing number of environmental regulations make the adoption of environmental management systems such as ISO 14001 more common and this necessitates training. While environmental training is receiving international attention, it is seemingly less prominently investigated in the South African context. In this article, results from an empirical study into the environmental training practices of Durban businesses are presented. By applying the ISO 14001 certification criterion, 24 businesses were identified as research participants. The practice of environmental training was investigated considering three themes i.e. environmental attitudes and culture, training resources and commitment, and impediments to environmental training. In exploring these themes, the main questions of the extent of environmental training and its effectiveness are determined. It was found that environmental training is widely practised across all businesses sampled, with impact-focused training topics supported by positive environmental attitudes. However, other areas emerge as problematic, including limited organisational prioritisation of environmental training as well as insufficient further training topics which can limit the efficacy of training activities.

Keywords: *environmental training; environmental education; ISO 14001; Environmental Management Systems; corporate sustainability*

Introduction

A learning organisation is an effective and innovative organisation that can successfully adapt to changing operational demands (Easterby-Smith & Lyle, 2011). This is particularly important in environmental management in the business arena, as businesses are at the forefront of economic activity in a context of environmental change (Lu, Marais & Zhang, 2014). Businesses are required to adapt to change as demanded by climate change impacts (Ziervogel et al., 2014), demand for production efficiencies (Bernardo, 2014) and growing public and

legislative pressures for environmentally sustainable and ethical business operations. One of the important ways to adapt is introducing and maintaining environmental management systems, and training employees for new ways of doing sustainable environmental business, thus deviating from 'business as usual' (Arimura, Hibiki & Katayama, 2008; Gotschol, De Giovanni & Vinzi, 2014).

With the changing environmental legislative and regulatory context in South Africa, it is imperative that adequate capacity building investment within business occurs (Kidd, 1997; Nel & Kotze, 2009). Businesses are at the forefront of environmental impact, necessitating the engagement of employees and company management in environmental training and awareness to effect meaningful change in promoting environmental best practice (Mentis, 2010; Sakr, Sherif & El Haggar, 2010). Though somewhat sparse nationally, there are research examples of organisational learning processes and education in non-ISO 14001 company-specific contexts (Price, 2007; Ward, 2012; Lindley, 2014). This research presents an opportunity to elaborate on the extent and nature of environmental training specifically within ISO 14001 certified businesses in the economically active metropolitan city of Durban. This paper is therefore a unique empirical study of how Durban businesses are taking up the challenge to implement environmental training in their ISO 14001 certified organisations. Specifically, three themes of environmental training are investigated in this study to explore the extent of training in organisations and the effectiveness of its application.

Conceptual framework

Sustainable development is the overarching discourse within which environmental training is positioned (see Figure 1). Sustainable development is encouraged through various mandatory regulations and voluntary mechanisms. The interpretation and evolution of environmental management in corporate greening has grown significantly. The appropriation of the ecological modernisation approach by companies can maximise environmental opportunities inherent in cleaner production and integrate environmental management with wide ranging benefits to the environment and to corporate bottom lines through resource efficiency and competitive advantage. Integrating environmental management (IEM) into business is considered a change management challenge and environmental management systems (EMS) are implemented to streamline adherence to environmental regulatory compliance and enhance proactive corporate risk management. Environmental training is an imperative cog in the machinery of environmental corporate change and is an integral element of ISO 14001 which is implemented in an effort to engage proactively with the environmental crisis and challenges of environmental regulations.
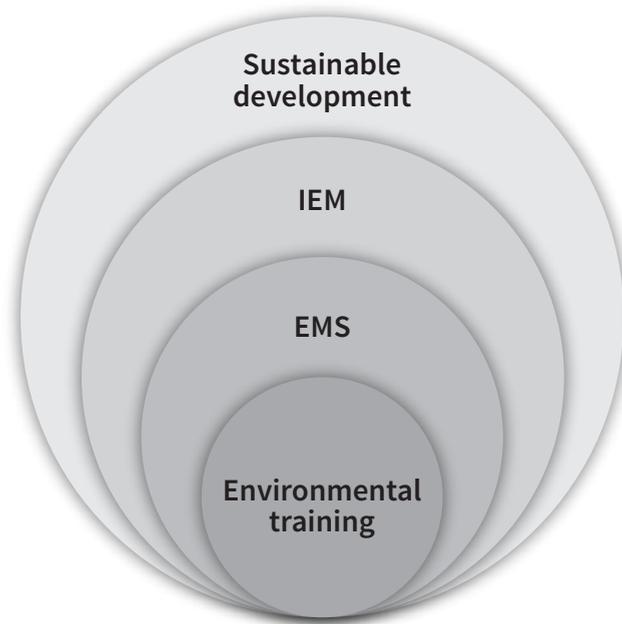
Figure 1 *Conceptual framework for environmental training*

Theoretical Background

Growing pressures for environmental performance

Addressing the challenges between economic growth and environmental sustainability have been the subject of much debate and discourse in recent decades (Elkington & Burke, 1989; Owen & Unwin, 1997). Much of the debate has focused on reconciliation between environmental sustainability and capitalist corporate growth, under the term 'ecological modernisation' (Hajer, 1995; Poncelet, 2004). Practically, this has led to optimistic understandings of the beneficial interactions between business and environmental sustainability, wherein reformist as opposed to radical action is envisaged (Dryzek, 1997). In this way business can benefit in terms of risk reduction, profit widening, brand improvement, and competitive advantage (Pojasek, 2010). More recent discourses of ecological modernisation often dispute the environmental sustainability of green capitalist growth (Ewing, 2017). It has been argued, however, that adopting green or cleaner technologies does not reverse global trends of environmental destruction sufficiently, and rather a rethink of capitalism as we know it is required (Bond & Downey, 2012). Reformist ideas such as those of conscious capitalism have grown in popularity for green economies (Mackey & Sisodia, 2014). Despite the disparate discourses that underpin clean and green technologies, businesses of varied types can no longer avoid the call to adapt to environmentally sustainable business operations.

A further impetus for change is voluntary self-regulation of companies, where companies have been encouraged to adopt environmental management systems (EMS) as part of

establishing an integrated environmental management tool (Department of Environment and Tourism [DEAT], 2004). In so doing, a systematic process for meeting minimum legal requirements and addressing broadly the necessary steps to achieving an environmentally sustainable business becomes seemingly more achievable. The widely adopted International Standards Organisation, namely ISO 14001, is a prominent example of such an environmental management system, comprising various iterative stages, within which environmental training and awareness is an important focal point (World Bank, 2000; Darnall, Henriques & Sadorsky, 2008).

Furthermore, Porter and Van de Linde (1996) have asserted that environmental issues have historically been dealt with as an outsourced, end-of-pipe strategy to meet minimum compliance requirements and this is counterproductive to meaningful and effective environmental change required of businesses. Creating value for business, society and the environment are not mutually exclusive as expounded by proponents of creating shared value (Porter & Kramer, 2011). Greater integration and transparency of environmental performance reporting with traditional business reporting is strongly promoted in South African businesses through sustainability reporting initiatives such as King III, the United Nations (UN) Global Compact and the Global Reporting Index (GRI). This is a compelling challenge to employers to recognise that a financial focus alone is a limited view of business performance (Fourie, Roux & De Jongh, 2012; Roberts, 2012). The notion that environmental management is considered change management and is negotiated through concerted environmental training such that the entire company embraces a learning organisation culture towards environmental management, is also supported by several studies (Davis, 1991; Pall & Welford, 1997; Welford, 1998; Jimenez & Lorente, 2001).

Role of sustainable development

Sustainable development has proved both an elusive and indispensable construct in bridging the gap between economic development and environmental protection (O'Riordan & Voisy, 1998; Mukhurjee & Kathuria, 2006). As business is the main agent for bringing about socio-economic change, it consequently carries substantial responsibility for environmental change (Rivera-Camino, 2011). Ultimately, a sustainable planet is one that develops economically and socially within the limits of the environment, balancing priorities of people, planet and profits (Hammer & Pivo, 2016).

Business controls much of societies' technological and productive capacity therefore change and innovation are within its grasp (Jimenez & Lorente, 2001; Muller, 2007). A company's EMS is a starting point in achieving environmentally sustainable business performance. As Giles (2008) pointed out, no management system however well designed can be effective without improving the ability of its employees and management to reduce the impacts of its operations. A company's EMS is only as good as the people that implement, innovate and internalise environmental action, and according to Sakr et al. (2010), necessitates the inclusion of the various tiers of corporate structure, including executive tiers. Several authors have confirmed the urgency to conduct business sustainably and it is therefore necessary that businesses are capacitated and informed to innovate and adapt to the contemporary

pressures imposed by the environment (Vidal-Salazar, Cordón-Pozo & Ferrón-Vilchez, 2012; Jabbour, 2013).

Environmental training in the context of an EMS

An EMS, initially a voluntary mechanism to ensure compliance to legal requirements and public and corporate competitive pressure, has in recent years become mandatory (Pojasek, 2010). South African business has responded to the call for environmental sustainability evidenced by the adoption of voluntary ISO 14001 certification and is among the top three African countries with significant certification (World Bank, 2000; To & Lee, 2014).

Researchers consider environmental training as an emerging environmental field of study and have credited ISO 14001 for formalising its inception and progress in corporate environmental management (Unnikrishnan & Hedge, 2007). Other researchers have also correlated effective environmental management positively with environmental training activities within ISO 14001 certified companies (Jabbour, 2013). In support of ISO 14001 as a systems approach, there is integral synergy linking environmental performance through a formalised EMS system process utilising environmental training and top management commitment (Tung, Baird & Schoch, 2014).

Environmental training is encompassed in the relatively new concept of environmental education as a form of problem-specific training within the business context (Ben-Pretez, 2013). Environmental training is one of the key stages in a robust EMS as it forms part of the iterative process of improvement and increased environmental performance. Environmental training supports Proactive Environmental Strategies (PES) that are characteristically voluntary in nature (and includes ISO 14001) and provides a corporate response to increasing environmental regulation pressures for compliance and stakeholder demands for sustainable products and services (Vidal-Salazar et al., 2012). Furthermore, it is firmly positioned with an environmental management approach as "environmental management is the incorporation of concern and environment-related opportunities in a business context, making production processes and products more environmentally suitable" (Haden et al., 2009, cited in Jabbour, 2013, p. 2).

Environmental training is established as a means to mitigate identified organisational environmental risks, which are minimised when employees are trained with relevant knowledge and skills (Lu et al., 2014). Mentis (2010) recommended that employees directly participate in risk mitigation in the identification and control of environmental risks. While Proactive Environmental Strategies are supported by company-specific environmental training emphasising operational implementation, the role of vocational or tertiary environmental education is not excluded in this effort (however the latter is not the focus of this particular study).

ISO 14001 prescribes the undertaking of environmental training by incorporating relevant legislation and standards into the design of the EMS objectives and training material. Environmental training is also a legislative requirement which is undertaken as a reasonable measure for companies to integrate environmental management into business functions for the mandated protection of the environment.

Methodology

The city of Durban (eThekwini) in KwaZulu-Natal, South Africa, has a large business sector comprising an estimated 2 796 businesses registered as members on the Durban Chamber of Commerce and Industry (DCCI, 2014). The DCCI is a formally constituted body under the Companies Act 71 of 2008, representing registered business interests (ibid.).

This was an exploratory study into relatively unknown environmental training phenomena in the regional context. The study utilised purposive sampling, selecting only ISO 14001 certified businesses to ensure that respondents were able to provide knowledgeable input on their organisational environmental training activities. The total number of ISO 14001 businesses in Durban is unknown. An approximation was determined using the South African Bureau of Standards website, where a total of fifty ISO 14001 certified businesses were identified within Durban. A criterion based purposive sampling strategy for a mixed method approach is used by researchers for understanding similarities and differences in a fairly unknown context of enquiry (Palinkas et al., 2015). Of the 50 businesses contacted for this study, a total response number of 24 businesses (48%) agreed to participate in the study. The study located respondents across Durban, particularly in the industrial heartland in the south and west of Durban.

For the purpose of this paper, selective results of a broader study are used focusing on the business respondent sample. The research instrument comprised a questionnaire survey, investigating the following three themes of enquiry in particular, which inform the results and discussion that follows:

1. Environmental attitudes and culture
2. Environmental training: Commitment and resources
3. Impediments to environmental training

Although this study makes use of a qualitative approach, a quantitative method of data collection through a survey method was used which was complemented by qualitative sampling and analysis strategy. Quantitative and qualitative forms of research are synergistic allies in allowing an explanation to emerge from data. This research which represents a mixed method strategy is explained further by Layder (2013, p. 12): "Qualitative analyses directly complement quantitative studies by providing data on the dynamics of encounters and lived experiences that quantitative information cannot directly supply. In other cases, qualitative studies explore areas about which little is known and which may then be enhanced by quantitative data and evidence". In support of mixed method studies that employ a qualitative approach, "the operational point is that data collection and analysis can be done in both modes and in various combinations, during all phases of the research process" (Strauss & Corbin, 1998).

The survey data gathered was analysed through the use of coding which organised the data into "meaningful patterns or segments and makes them practically manageable" (Layder, 2013, p. 139). These descriptions were generally void of specific interpretations or judgements

but aim to give a picture or context of the sample respondents. It was considered best to represent the data graphically and in table formats.

Research findings

The business respondents consisted of management or supervisory level staff with designated environmental competencies. The following business activities are represented in the sample: manufacturing (50%), business services (i.e. non-industrial), petrochemical and industrial services account collectively for 38%, agricultural (4%) and transportation industries (8%).

Environmental attitudes and culture

All respondents (Figure 2) agreed to strongly agreed to positive personal attitudes towards the environment outside the workplace with strong positive behaviours shown in the use of energy efficient lighting, waste recycling and carpooling.

Personal values and environmental attitudes of managers and staff are an important causal link to favourable environmentally-conscious behaviours and decision-making in the workplace (Papagiannakis & Lioukas, 2012). Personal values of managers are shown to be effective predictors of environmental adaptability in the workplace as commented by Papagiannakis and Lioukas (2012, p. 44) who stated that "managers are more likely to change the way their firms operate, if that change is in line with their personal values". The responses therefore correlated with this idea positively as management level responses show high personal environmental values and attitudes.
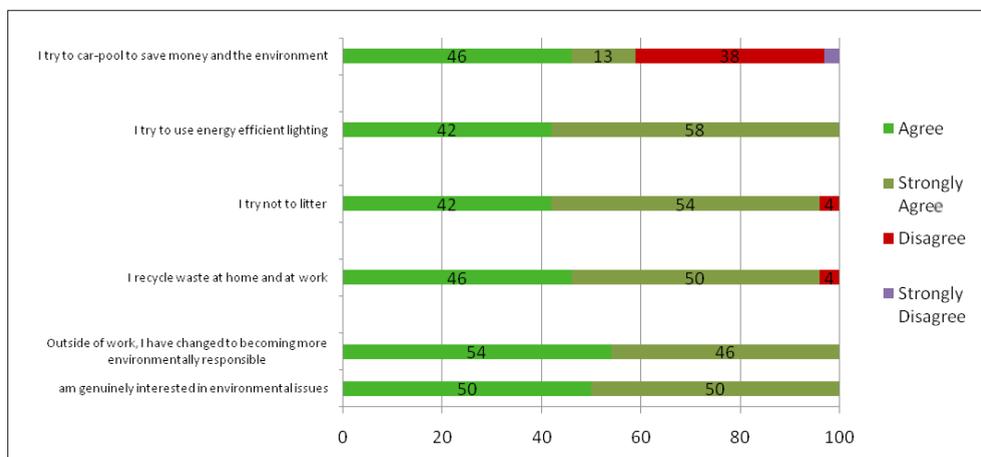

Figure 2 *Business respondents attitude and behavioural responses (%) (n=24)*

Attitudes toward considering the environment in business decision making

The extent to which personal values are transferrable in the business context in environmental decision making was examined (Figure 3). Respondents strongly agreed to understanding

the impacts of their business activities (83%) and to the importance of environmental issues in business (83%). This shows an environmentally aware attitude towards corporate environmental sustainability. A trend to prioritise environmental decisions was evident from 79% of respondents strongly agreeing to consider environmental issues in decision making. Furthermore, respondents indicated an awareness of business impacts (100%) and that business resources and finances must be prioritised for effective environmental management. This indicates that these businesses could undertake critical decision making in terms of resources and finances. Such decision making is important as Lesourd and Schilizzi (2001) explained that managing environmental impacts is costly and includes acquiring high-tech equipment, technical expertise, training resources and time.
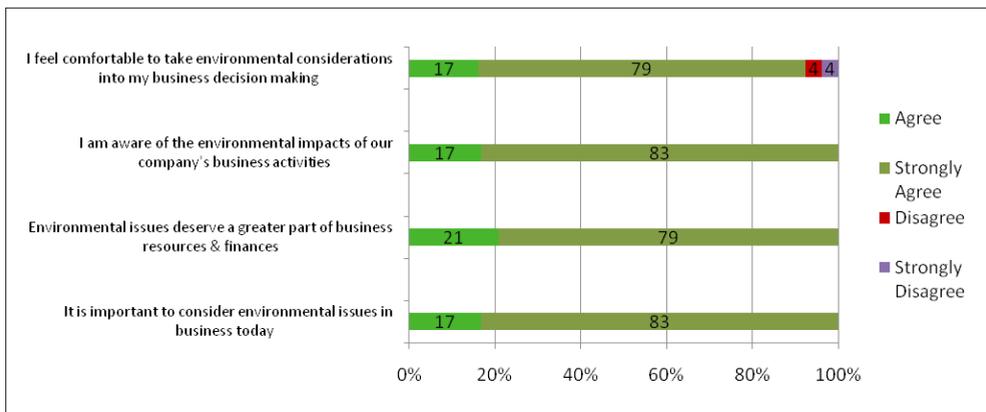

Figure 3 *Business respondent's environmental decision making responses (%) (n=24)*

Perceptions of the environment in company culture

The culture of the company indicates whether there is a tendency to embrace environmental change in decisions and strategy that is informed through environmental training. Hutchinson (1996) and Baird and Henderson (2001) emphasised that creating an environmentally aware culture is an important business strategy to accomplish adaptable and sustainable business practices and behaviours. The responses (Figure 4) indicate strong agreement (96%) that mainstreaming environmental issues in business is a change to business as usual while 96% of respondents agreed to strongly agreed that their companies are adapting to this change accordingly. Further, 71% of respondents strongly agreed that leadership plays a strong role in promoting environmental issues in their companies. Fourie et al. (2012) emphasised that responsible leadership is critical to promote a learning culture in the workplace by encouraging skills development that gives employees the confidence to integrate environmental decisions in their daily work routines. As the respondents represented management level competencies, these responses also indicate their willingness to lead a decisive culture of environmental learning in their companies. The responses further showed a positive perception of the environment is being promoted in their business culture.
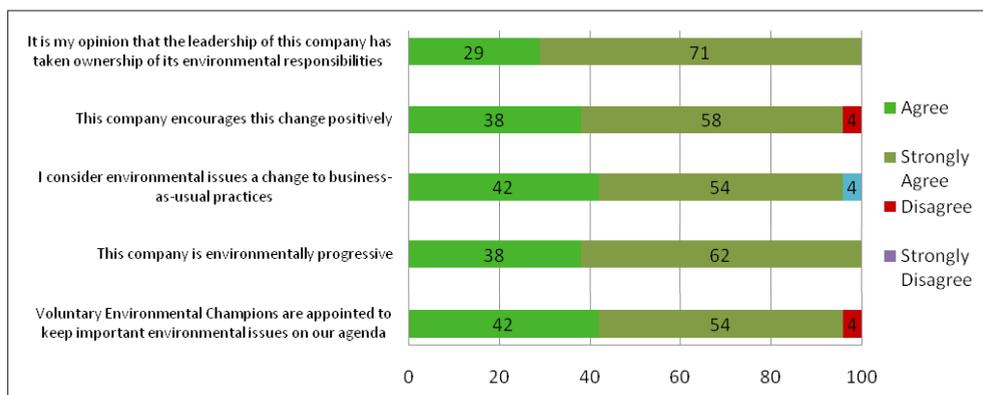
Figure 4 *Business respondents perceptions of environmental culture (%) (n=24)*

Proactive environmental strategies

Figure 5 shows awareness and level of agreement with implementation of proactive environmental strategies. These strategies are not end-of-pipe and part of an approach to environmental management that goes beyond compliance (Vidal-Salazar et al., 2012).

Respondents predominantly agreed (68%) that their companies were proactive in environmental management. Results revealed that environmental auditing (in keeping with the ISO 14001 prescription) and proactive resource planning are prioritised. Proactive resource planning includes reducing water use (79%) and energy consumption (83%). Environmental impacts appeared to be proactively managed as indicated by 88% who agreed that their companies have a waste recycling programme, use renewable energy (46%) and plan their energy consumption (71%).
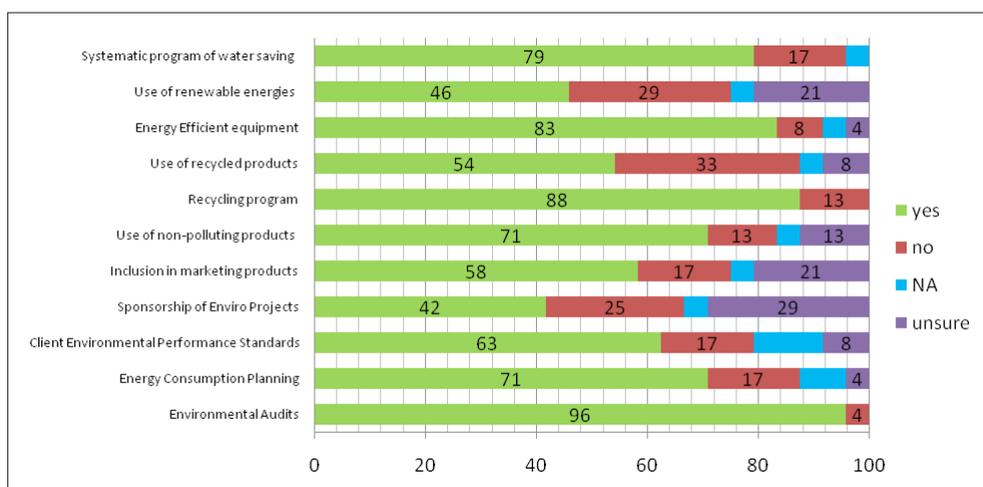

Figure 5 *Respondents' perceptions of implemented proactive strategies (%) (n=24)*

Environmental training: Commitment, resources and methods

Commitment to environmental training was indicated by frequency of training, resources committed in terms of cost and expertise as well as company-wide exposure to environmental training. Respondents predominantly agreed (83%) that environmental training is an important priority. The details of how this was prioritised are inferred from how training is conducted and what resources are committed to training.

Financial and human resource commitment for environmental training

While 83% of respondents asserted that environmental training was a priority, only 38% committed over R60 000 per annum to environmental training. The inability to confirm an environmental training budget by 37% of respondents indicates that budget allocations are not routinely prioritised for environmental training. There are no South African environmental training budget benchmarks; however, according to the National Skills Accord, companies should commit 1% to 5% of their annual payroll to skills development (Department of Economic Development, 2011). Considering the latter national impetus to develop environmental skills, a sizeable portion of this percentage for environmental training is justifiable. Given this, the training budget allocation of respondents is considered low.

Table 1 *Business respondents' environmental training budget per annum*

Training budget (R)	Percentage of frequency (n=24) %
0–20 000	17
20 000–40 000	4
40 000–60 000	4
Over 60 000	38
Unsure	37
Total	100

Frequency of training across the various tiers of company structure

There is a consistent call for all levels of an organisation to get involved in environmental training especially company leaders to motivate employees to embrace the changes and new paradigm of environmental sustainability (Kashmanian, Keenan & Wals, 2010; Sakr et al., 2010). The results show that there is an uneven frequency of training across the company tiers indicating that executive levels are undertaking training significantly less than the lower tiers of staff. Table 2 reveals the most frequent training duration reported by 31% of the respondents is 1 to 10 hours per annum.

Table 2 *Total collated responses for duration and frequency of undertaken training per annum*

Duration of training (hours/year)	1-10	10 -20	20-40	>80	None	As needed	No specific time	N/A	Total
Business responses (%)	31	8	6	5	6	25	11	8	100

However, 25% of respondents could not confirm the hours of training received by the different company tiers and indicated that training is attended as needed. Overall, the responses show that training occurs predominantly in under 80 hours/year.

It is apparent that training is most frequently attended by lower tiers of company structures. Respondents (67%) confirmed that factory level staff and temporary working staff have most frequently received training. Office workers are also reported by respondents (63%) to frequently attend training. A concerning trend shows that CEOs, CFOs and directors are reported to attend training least frequently (8 to 13%) (Figure 6).
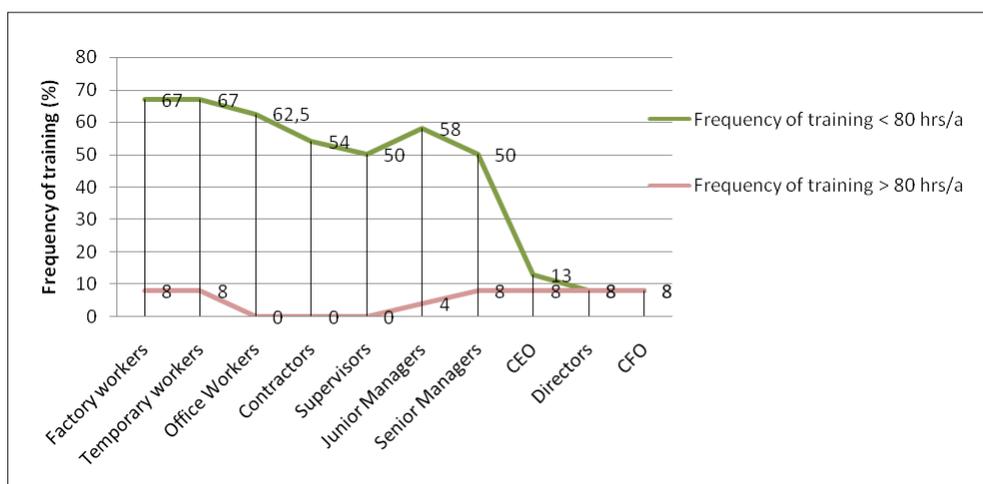

Figure 6 *Frequency of training per company tier*

Training methods

It is further important to assess the types of training methods frequently used to train the different tiers of the company structures. Figure 7 show the various training methods used across all the tiers with the exception of field trips which are used exclusively by supervisors, junior managers and senior managers. Correlating with the previous finding that factory and temporary workers undergo the most frequent training, these tiers also receive the highest frequency of onsite training and video training methods. Online training is used least frequently across all tiers; however, it is most prominently and equally used among the directors, CFOs,

and CEO tiers as shown by 23% frequency for each respectively. Furthermore, supervisors, junior managers and senior managers mostly received training via workshops, onsite training and through the use of company publications. Interestingly, the company tiers of CFO, CEO and directors are most commonly reported to not receive any environmental training via any of these methods as confirmed by 26%, 14% and 17% of respondents respectively.
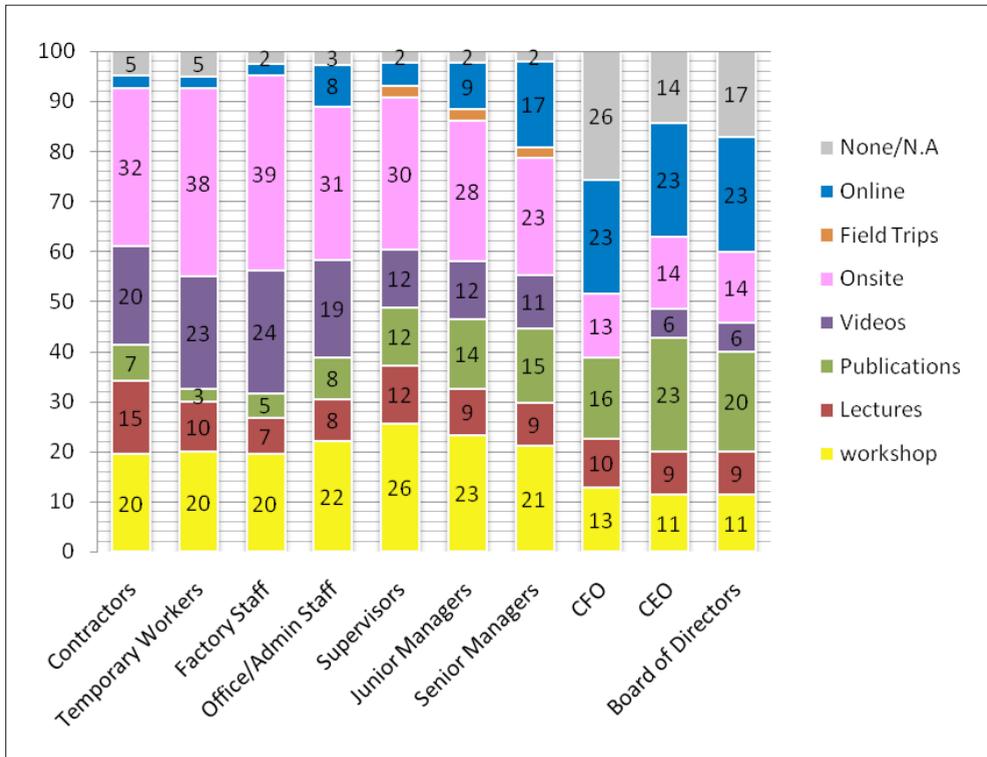

Figure 7 *Frequency of training methods used per company tier (%) (n=24)*

Environmental training topic coverage

One of the main goals of environmental training is to reduce environmental impacts of business operations by providing employees with the necessary skills to understand and reduce the company-specific environmental impacts (Jabbour, 2013). Figure 8 presents 14 environmental impact training topics. There are seven high frequency responses (over 90%) apparent for various impact training topics and these are ranked as follows: waste management, hazardous chemicals, general environmental awareness, energy efficiency, accident/spillage, water use and conservation and environmental legal liability and risk management. Waste management remains a topic covered most frequently as stated by 100% of respondents. This correlates positively with the results shown previously regarding proactive environmental strategies, which show the highest frequency of responses (88%) in accordance with an implemented

waste recycling programme. The least frequently reported (42%) environmental training received is production and manufacturing eco-efficiency. Incidentally, this was also the highest expressed need for further training by 50% of the respondents.

In terms of the respondents' need for environmental impact training, the findings also indicated the following training needs: environmental sustainability best practice in business (38%), environmental performance and systems training (29%), supply chain eco-efficiency (29%), emission permits (25%), and EIA and auditing methodologies (25%).
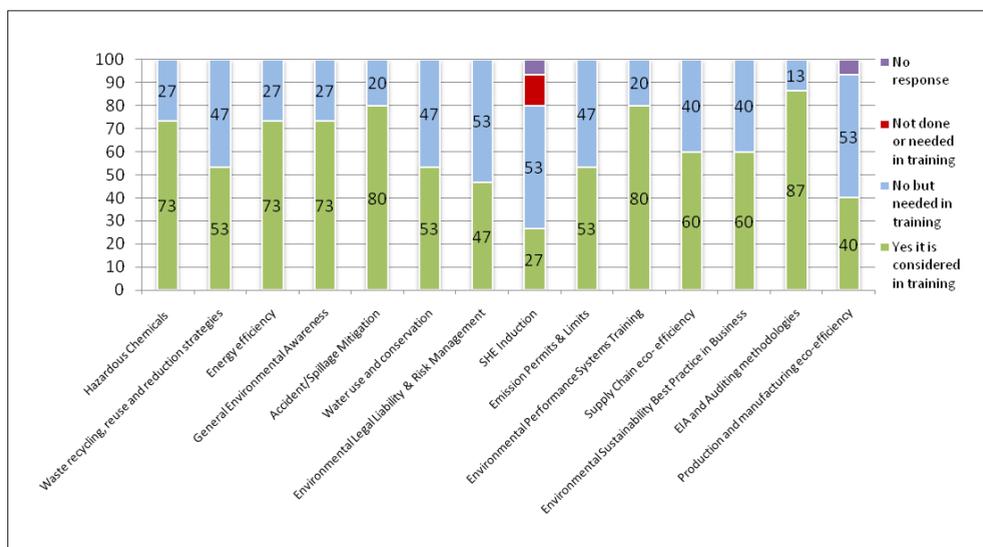

Figure 8 *Frequency of environmental training topics covered (%) (n=24)*

Environmental training methods and integration

It was important to explore the degree of integration of environmental training with other training needs as ISO 14001 EMS is commonly integrated with other Safety, Health, Environment and Quality (SHEQ) management systems (Table 3). The respondents predominantly agreed (66%) that environmental training was integrated with other training. Further, only 11% of respondents agreed that environmental training was offered as a separate course.

It is found that the integration of environmental priorities with other Safety and Health competencies is commonplace from the survey sample, indicating that these companies are challenged by the pressures to make their workplaces both safe and as environmentally compliant as possible. This sharing of training portfolios partly explains the low management and executive involvement in environmental training and inconsistently prioritised environmental training budgets. Prakash and Potoski (2006) confirmed the common practice of linking of Safety and Health with Environmental Management as this is considered a way of streamlining disparate management systems and resources such as is the case with ISO 14001 and ISO 9001.

Table 3 *Integration of environmental training*

Is environmental training conducted with other training? (%)				
	Yes	No	Sometimes	Total
Business respondents (n=24)	66	20	14	100
Responses on how training is conducted in relation to other training (%)				
	Business respondents (n=24)			
Part of SHEQ training	24			
Integrated with other training	18			
Part of induction training	29			
Part of Environmental Health training	18			
As a separate course	11			
Total (%)	100			

Impediments to environmental training

Impediments included management commitment and organisational cultures as well as the practicalities of cost, time and expertise in conducting environmental training. The impediments to training, though not exhaustive, give an indication of the potential for improvement of environmental training practices.

Figure 9 may reflect the respondents' optimism regarding their environmental training experience as there is a higher frequency of disagreement with the impediment statements than agreement. However, the highest response in agreement was 67% of respondents to the impediment statement 'require expert knowledge'. Another important impediment (71%) was 'high costs'. 'Difficulty in evaluating the outcomes' was also agreed to by 42% of respondents. These impediments were similarly identified by Vidal-Salazaret al. (2012), underscoring the role of training evaluation which increases the value perception of environmental training by managers, thereby allowing them to invest in environmental training more readily and confidently.

The statement 'too technical to understand' received the highest disagreement response of 83%. This indicates a general high level of understanding of environmental training content and a positive attitude towards learning new and likely unfamiliar environmental information.
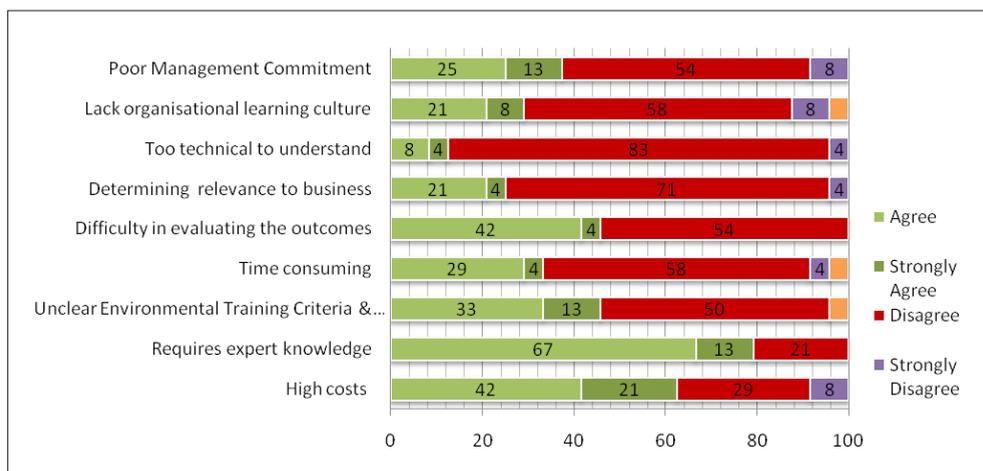
Figure 9 *Impediments to Environmental Training*

Discussion of findings

Extent of environmental training and awareness

The extent of environmental training within the businesses investigated was significant. Over 80% of respondents agreed to implement environmental training activities. Most of the respondents understood the role of ISO 14001 EMS in reducing environmental impacts and also indicated greater knowledge of their company's environmental policy. It is evident the ISO 14001 certified businesses in Durban prioritise environmental management and training competencies predominantly within the SHE and SHEQ occupational roles. There is a high level of commitment to training indicated, however the training frequency indicated by 50% of respondents confirmed predominantly one to two training courses are undertaken annually. Involvement of the executive tiers of organisation in environmental training is significantly lacking and there is a need to focus further attention in this area.

Positively, there was extensive topic coverage on environmental impacts. The focus of environmental training courses shows a particularly high focus on waste management. Other frequently reported training topics by 95% of respondents included hazardous chemicals and general environmental awareness.

Considering the extensive topic coverage, respondents indicated further relevant environmental training needs in production and manufacturing eco-efficiency. While environmental training is mostly integrated with other SHEQ training it does not appear to hinder relevant environmentally impact-focused training topics coverage as discussed in reference to findings in Figure 8. Bernstein (cited in Perron, Côté & Duffy, 2006, p. 553) argued there is a strong connection between change and employee participation where "managing change is impossible without employee participation … participation is impossible without understanding". Environmental training therefore presents the opportunity to operationalise the voluntary compliance effort across a company by raising environmental

awareness and skills of its workforces to effectually stay ahead of regulation requirements and reap the benefits of competitive advantage offered through environmental sustainability (Blackburn, 2008; Mammatt, 2012). However, what becomes critical is adapting the workforce to these changes, which present specific organisational challenges that are addressed within environmental training practices (Perron et al., 2006; Vidal-Salazar et al., 2012). Knowledge management and organisational learning are also interdisciplinary organisational discourses that influence environmental training (Vidal-Salazar et al., 2012).

Effectiveness of training activities

Vidal-Salazar et al. (2012) confirmed that effective training should fit with organisational goals and strategy. This is supported by the ISO standard where the environmental policy directs the aim of the training activities. Furthermore, effective training is ideally a company-wide activity and should be embraced in an organisational culture of learning. This is often best indicated by how widespread the environmental training reach is within a company. For example, the extent of proactive environmental strategy activities, in reducing water, energy and waste is significant in showing that training is contributing to increased environmental performance. This is supported by the purported benefits of ISO 14001 which are categorised broadly as environmental, reputational and organisational. The adoption and assimilation of ISO 14001 has been shown to correlate positively with environmental performance targets in managing air emissions, waste management and the use of resources, not surprisingly mediated through environmental training activities (Testa et al., 2014).

Further, all tiers of company structures were reportedly exposed to environmental training; however, the duration of the training was focused predominantly on the lower tiers of company structures such as factory, temporary and office staff. Middle management and business executives spend less time in environmental training. This may be problematic in sustaining long-term effectiveness of the training.

The impediments to environmental training indicate areas of improvement that can enhance the effectiveness of the activity. The impediments of high cost, for example, can be improved by greater buy-in from executive tiers in allocating more financial resources to environmental training. Lack of organisational culture was also frequently identified as an impediment, which indicates that environmental training has the potential to be more than a rubber-stamping exercise and can have far-reaching impacts in business operations. The effectiveness of training therefore can be seen as an area requiring greater organisational prioritisation from executive management. Importantly, the positive environmental attitudes and the proactive environmental strategy activities embraced by the respondents was an indication that improvements to environmental training activities are welcomed by managers.

There is an established link between top management commitment to company environmental issues and the allocation of sufficient resources to enable environmental performance (Tung et al., 2014). Researchers have indicated that financial commitment improves the chances of positive environmental performance and environmental training outcomes (Perron et al., 2006). However, environmental training can sometimes be falsely

perceived by managers as a risky investment compared to other training needs (Vidal-Salazar et al., 2012).

With reference to the conceptual framework for this research, the predominance of manufacturing business types in this sample confirms the prioritisation of implementation of ISO 14001 EMS. Similarly, this correlates with the eThekwini IDP which identified that the 22% provincial GDP contribution is supported through Durban's manufacturing activities located within the petroleum, fuel, rubber and chemical industries (eThekwini-Municipality, 2014, p. 30). As Van der Linde (2009) indicated, environmental impacts are stringently regulated specifically aimed at controlling emission and pollutants in industry. The focus on clean production and developing the requisite skills for this is indicated in these Durban sample results. This is similarly supported by Unnikrishnan and Hedge (2007, p. 428) who stated that "cleaner production requires new attitudes, knowledge and skills for all professionals to ensure that preventive environmental strategies are integrated into planning and development activities across society".

Conclusion

This paper reveals results on the environmental training activities in selected Durban businesses. Firstly, environmental training is promoted within ISO 14001 certified companies. While the extent of ISO 14001 certification in Durban companies appears limited, the extent of environmental training activities is significant within the organisations investigated. There is room for improvement, however there is sufficient progress shown in growing company cultures, attitudes and environmental training activities to conclude an effective training paradigm is present.

The findings confirmed that a range of environmental training practices are widely practised in the selected Durban businesses. The perception of management and employees positively link environmental training to improved environmental management and performance. However, the following needs for further improvement have been identified for the selected Durban businesses:

- Greater involvement of executive tiers of company structures in environmental training activities.
- Further training topic coverage in production and manufacturing eco-efficiency; environmental legal liability and risk management.
- Prioritisation of environmental training in financial budgeting allocation separate from other Safety and Health priorities.

Notes on the contributors and their contributions

Lead author

Sennoga, Dianne

University of KwaZulu-Natal, South Africa

Dianne Sennoga is an environmental consultant focusing on environmental management and planning. She also teaches environmental management courses.

Co-author

Ahmed, Fathima

University of KwaZulu-Natal, South Africa

Fathima Ahmed is a lecturer in Human Geography and she examines human-environment interactions from a critical geography standpoint, focusing on the African spatial context.

Percentage contribution

Areas of contribution	Author	Percentage contribution
Conception or design of the paper, theory or key argument	Sennoga	80 %
	Ahmed	20 %
Data collection	Sennoga	90 %
	Ahmed	10 %
Analysis and interpretation	Sennoga	80 %
	Ahmed	20 %
Drafting the paper	Sennoga	80 %
	Ahmed	20 %
Critical review of paper	Sennoga	70 %
	Ahmed	30 %

References

Arimura, T.H., Hibiki, A., Katayama, H. (2008). Is a voluntary approach an effective environmental policy instrument? A case for environmental management systems. *Journal of Environmental Economics and Management, 55*(3), 281-295.

Baird, L. & Henderson, J. C. (2001). *The knowledge engine: How to create fast cycles of knowledge to performance and performance to knowledge.* San Francisco, CA: Barrett-Koehler.

Ben-Peretz, M. (2013). Environmental education is too important to be left in the hands of teachers alone. In T. Bakshi & Z. Naveh (Eds.), *Environmental Education: Principles, methods and applications.* New York: Plenum Press.

Bernardo, M. (2014). Integration of management systems as an innovation: A proposal for a new model. *Journal of Cleaner Production, 82*, 132-142.

Blackburn, W.R. (2008). *The Sustainability Handbook*. London: Earthscan.

Bond, E. & Downey, L. (2012). Green technology and ecologically unequal exchange: The environmental and social consequences of ecological modernization in the world-system. *American Sociological Association, 18*(2), 167-186.

Darnall, N., Henriques, I. Sadorsky, P. (2008). Do environmental management systems improve business performance in an international setting. *Journal of International Management, 14*, 364-376.

Davis, J. (1991). *Greening business: Managing for sustainable development*. UK: Oxford.

DCCI (Durban Chamber of Commerce and Industry). (2014). *You Missed it – Environmental Forum*. Retrieved 13 April 2015 from http://durbanchamber.co.za/profiles/blogs/you-missed-it-environmental-forum

DEAT).(2004). *Overview of Integrated Environmental Management. Information series*. Pretoria: Government Printers.

Department of Economic Development. (2011). *New Growth Path: Accord 4 Green Economy Accord*. Pretoria: Government Printers.

Dryzek, J.S. (1997). *Politics of the Earth*. New York, NY: Oxford University Press.

Easterby-Smith, M. & Lyle, M.A. (2011). *Handbook of Organisational Learning and Knowledge Management*. New Jersey: John Wiley & Sons

Elkington, J.B. & Burke, T. (1989). *The green capitalism: How industry can make money and protect the environment*. London: Victor Gollancz.

eThekwini-Municipality. (2014). *eThekwini Integrated Development Plan. 2013/2014 Annual Review Report*. Pretoria: Government Printers.

Ewing, J. A. (2017). Hollow Ecology: Ecological modernization theory and the death of nature. *Journal of World-Systems Research, 23*(1), 126-155.

Fourie, W., Roux, J. N. & De Jongh, D. (2012). Responsible leadership and the changing social contract. In G. Terry (Ed.) *Green II: Why corporate leaders need to embrace sustainability to ensure future profitability* (pp. 71-87). South Africa: SAICA JUTA.

Giles, F. (2008). Assessing the effectiveness of your environmental management system. *Journal of Environmental Quality Management, 18*, 1-16.

Gotschol, A., De Giovanni, P., & Vinzi, V.E.(2014). Is environmental management an economically sustainable business? *Journal of Environmental Management, 144*, 73-82.

Hajer, M. (1995). *The Politics of Environmental Discourse: Ecological Modernisation and the Policy Process*. New York, NY: Oxford University Press.

Hammer, J. & Pivo, G. (2016). The triple bottom line and sustainable economic development theory and practice. *Journal of Economic Development Quarterly, 31*(1), 1-12.

Hutchinson, C. (1996). Strategic framework for environmental management. In: R. Welford & R. Starkey R (Eds.) *Earthscan reader: The challenge of going green*. London: Earthscan.

Jabbour, C.J.C. (2013). Environmental training and environmental management maturity of Brazilian companies with ISO14001: Empirical evidence. *Journal of Cleaner Production, 74*, 144-155.

Jimenez, J.B. & Lorente, J.J.(2001). Environmental performance as an operations objective. *International Journal of Operations & Production Management, 21*, 1553-1572.

Kashmanian, R., Keenan, C. & Wells, R. (2010). Corporate environmental leadership: Drivers, characteristics and examples. *Environmental Quality Management, 19*,1-20.

Kidd, M. (1997). *Environmental Law: A South African Guide.* Kenwyn: Juta.

Layder, D. (2013). *Doing Excellent Small-Scale Research.* Thousand Oaks, CA: Sage.

Lesourd, J. & Schilizzi, S.G.M. (2001). *The Environment in Corporate Management: New directions and economic insights*. Cheltenham: Edward Elgar.

Lindley, D. (2014). *Can expansive (social) learning processes strengthen organisational learning for improved wetland management in a plantation forestry company, and if so, how? A case study of Mondi.* Unpublished PhD thesis, Education Department, Rhodes University, Grahamstown.

Lu, Y., Marais, K. B. & Zhang, S. (2014). Conceptual modelling of training and organizational risk dynamics. *Procedia Engineering, 80*, 313-328.

Mackey, J. & Sisodia, R. (2014). *Conscious Capitalism: Liberating the heroic spirit of business.* Boston, MA: Harvard Business School.

Mammatt, J. (2012). The impact of sustainability issues on business. In: Terry G (ed) *Green II: Why corporate leaders need to embrace sustainability to ensure future profitability.* Pretoria: Saica JUTA, 52-71

Mentis, M. (2010). *Environmental Risk Management in South Africa.* Hillcrest: Mentis.

Mukhurjee, S. & Kathuria, V. (2006). Is economic growth sustainable? Environmental quality of Indian States after 1991. *International Journal of Sustainable Development, 9*(1), 38-53.

Muller, K. (2007). Organisational innovation: Some emerging environmental governance models in South Africa. *Politeia, 26*(1),45-59.

Nel, J. G. & Kotze, L. G. (2009). Environmental Management: An Introduction. In H.A. Strydom & N.D. King (Eds.) *Fuggle & Rabie's Environmental Management in South Africa.* Cape Town: Juta.

O'Riordan, T. & Voisy, H. (1998). *The Transition to Sustainability: The Politics of Agenda 21 in Europe.* London: Earthscan.

Owen, L. & Unwin, T. (1997). *Environmental Management: Readings and case studies.* Oxford: Blackwell.

Pall, R. & Welford, R. (1997). *Clouding the Crisis: The construction of corporate environmental management in hijacking environmentalism*, London: Earthscan.

Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Journal of Administration and Policy in Mental Health, 42*(5), 533-544.

Papagiannakis, G. & Lioukas, S. (2012). Values, attitudes and perceptions of managers as predictors of corporate environmental resposiveness. *Journal of Environmental Management, 100*, 41-51.

Perron, G.M., Côté, R.P. & Duffy, J.F. (2006). Improving environmental awareness training in business. *Journal of Cleaner Production, 14*, 551-562.

Pojasek, R.B. (2010). Is sustainability becoming a regulatory requirement? *Environmental Quality Management, 19*, 83-90.

Poncelet, E.C. (2004). *Partnering for the Environment: Multistakeholder collaboration in a changing world*. New York, NY: Rowman & Littlefield.

Porter, M. & Kramer, M. (2011). Creating Shared Value. *Harvard Business Review, 89*, 62-77.

Porter, M. & Van de Linde, C. (1996). Framing environmental improvement in terms of resource productivity. In R. Welford & R. Starkey (Eds.) *Earthscan Reader: Business and the Environment*. UK: Earthscan, 63-77.

Prakash, A. & Potoski, M. (2006). *The voluntary environmentalist: Green Clubs, ISO14001 and voluntary regulations*. Cambridge, UK: Cambridge University Press.

Price, L. (2007). *A transdisciplinary explanatory critique of environmental education (Volume 1) Business and industry*. Unpublished thesis, Rhodes University, Grahamstown.

Roberts, L. (2012). Integrated reporting. In G. Terry (Ed.) *Green II: Why corporate leaders need to embrace sustainability to ensure future prosperity*. South Africa: SAICA & Juta.

Rivera-Camino, J. (2012). Corporate environmental market responsiveness: A model of individual and organisational drivers. *Journal of Business Research, 65*, 402-411.

Sakr, D.A., Sherif, A. & El Haggar, S.M. (2010). Environmental Management Systems Awareness: An Investigation of the Top 50 Contractors in Egypt. *Journal of Cleaner Production, 18*, 210-218.

Strauss, A. & Corbin, J. (1998). *Basics of Qualitative Research*. Thousand Oaks, CA: Sage.

To, W.M. & Lee, P.K.C. (2014). Diffusion of ISO 14001 environmental management system: global, regional and country-level analyses. *Journal of Cleaner Production, 66*, 489-498.

Testa, F., Rizzi, F., Dadi, T., et al. (2014). EMAS and ISO14001: The differences in effectively improving environmental performance. *Journal of Cleaner Production, 68*, 165-173.

Tung, A., Baird, K. & Schoch, H. (2014). The relationship between organisational factors and the effectiveness of environmental management. *Journal of Environmental Management, 144*, 186-196.

Unnikrishnan, S. & Hedge, D. S. (2007). Environmental training and cleaner production in Indian industry – A micro level study. *Journal of Resources, Conservation and Recycling, 50*, 427-441.

Vidal-Salazar, M. D., Cordón-Pozo, E. & Ferrón-Vilchez, V. (2012). Human resource management and developing proactive environmental strategies: The influence of environmental training and organizational learning. *Human Resource Management, 51*, 905-934.

Ward, M. (2012). *Learning and the Creation of Sustainable Value: A case study of the Mondi Group*. Unpublished master's thesis, Henley Business School, UK.

Welford, R. (1998). *Corporate Environmental Management: Systems and strategies*, London: Earthscan.

World Bank. (2000). *Greening Industry, New Roles ISO Quality Management Systems or Communities, Markets & Governments. Policy Research Report*. Oxford: World Bank.

Ziervogel, G., New, M., Archer van Garderen, E., Midgley,G., Taylor, A. Hamann,R. & Stuart-Hill, S. (2014). Climate change impacts and adaptation in South Africa. *WIREs Climate Change, 5*, 605-620.