

Environmental Education and Training for Greening People and Corporate Cultures

Law MS; Hills P; Hau BCH
The University of Hong Kong; mslaw042@hku.hk

Abstract

Education and training are recognized as the crux of developing green organizational cultures in the achievement of corporate sustainability. Should ecology training be linked with the practical work of corporate members? Should they “learn by doing” or “do by learning”? The present study covers the links between environmental education and training and its success in greening the employees and corporate cultures. It investigates the effectiveness of environmental training and models a suitable training approach in developing environmentally aware corporate cultures. A series of environmental education and awareness training programmes of The Hong Kong and Shanghai Banking Corporation Limited (HSBC) were used as a case study. Evaluation of the training outcomes, in terms of changes in participants’ environmental knowledge, attitudes and behaviour, was surveyed by using self-completion questionnaires. Results showed that employees who joined these programmes gained knowledge and changed their values and behaviour towards the environment significantly. The acquisition of knowledge and attitude change leads to the development of green behaviour both in the workplace and at home. The study concludes that environmental training is important as the employees have direct contact with nature for affective-based attitudes while a proportion of indirect experience training is responsible for intellectual development. A combination of direct- and indirect- experiences in the training is proved to have greatest impact on the training outcomes. Training should be available for employees from each stratum in the company rather than only focusing on pin-pointed management staff since it can promote a workable interface between employees and the corporation.

Keywords: Environmental Education, Corporate Sustainability, Environmental Training, Environmental Management, Employee Engagement

1. Introduction

Focus has recently shifted towards business as a key player in bringing about a more sustainable future (Marrewijk and Hardjono, 2003, Dyllick and Hockerts, 2002, Ahmad et al., 2012). Corporate sustainability can accordingly be defined as “meeting the needs of a firm’s direct and indirect stakeholders, without compromising its ability to meet the needs of future stakeholders” when applying the idea of sustainable development to the business level (Dyllick and Hockerts, 2002). Achieving corporate sustainability becomes one of the main goals of many companies, especially multinational firms (Hockerts, 2001, Montiel, 2008, Hart, 1997, Wikström, 2010). Many multinational firms accept that corporate sustainability is a prerequisite for doing business and surviving in a competitive market place (Dyllick and Hockerts, 2002, Hockerts, 2001, Marrewijk and Hardjono, 2003). They are of immense importance because they define and use sustainability affect other companies (Wikström, 2010). However, in many cases, corporate sustainability becomes a rhetoric when corporations fail to integrate sustainability issues into their business routines and strategies (Baumgartner and Ebner, 2010). Marrewijk and Hardjono (2003) delineates a change in corporate culture and management as playing an important role in leading to stronger commitment and implementation of corporate sustainability. Baumgartner and Winter (2013) also suggests that a corporation has to engage directly in sustainability-related activities such as to organize and structure sustainability into its management system and strategies.

Education and employee awareness training are very well-known in achieving corporate sustainability. The presence of effective environmental education and awareness training

for staff is crucial to the development of new business cultures in an environmentally friendly manner leading towards sustainable development and allowing employees to learn and adopt new and green attitudes, ideas and skills (Beard, 1996b, Perron et al., 2006, Madsen and Ulhøi, 2001, Stringer, 2009, Ahmad et al., 2012). However, little information is available to suggest how environmental education and training can be implemented and their effectiveness in encouraging green behaviour and attitudes of employees. Should the training be linked with the practical work of employees? Should they “learn by doing” or “do by learning”? Should the training focuses on the management level or employees from the whole strata within the company? To answer these unknown, evaluated the effectiveness of corporate environmental training and investigated a suitable training method in developing environmentally aware corporate cultures. A five-year environmental education and training programme of a world-wide leading bank is used as a case study.

1.1. Objectives

The objectives of this paper are (1) to evaluate the effectiveness of the training strategies and outcomes in gaining environmental knowledge and in changing employees’ environmental attitude and behaviour; and (2) to examine suitable training approaches and strategies in greening employees and company culture. Properly designed environmental awareness training can help to develop and transit a greener culture by changing employees’ knowledge and attitudes on environmental issues as well as promoting the intention of pro-environment behaviour, both at work and in daily life.

2. Literature reviews

2.1. Achieving corporate sustainability

Previous studies in the themes of corporate sustainability, scholars suggest a number of models of sustainable development for business. The most well-known model is outlined by Elkington (1998) . He suggested that corporate sustainability requires integration of the economic, ecological and social aspects in a “triple-bottom-line”. Businesses have to guarantee mean sustainable profits and economic growth which compatible with social and ecological sustainability including facilitating human capital and environmental reform in the community(Dyllick and Hockerts, 2002). Although the “triple-bottom-line” concept is increasingly accepted by the business sector and governments(Hockerts, 2001, Norman and MacDonald, 2004), many scholars claim that integrating the three spheres’ “profit and loss accounts” can only result in an incomplete and misleading concept. This concept fails to take the company’s traditional measures – profitability and economic efficiency– into account(Marrewijk and Hardjono, 2003). The main concern of corporations is to achieve the economic goals with economic rules in which sustainable development is defined as a sustainable competitive advantage(Bansal, 2002). Therefore, training employees and developing sustainability-related competences has been regarded as an important aspect of corporate initiative on sustainability by greening the corporate culture(Ahmad et al., 2012). Without the support and commitment of employees who are playing a central role to the operation of organization, the overall goal of sustainability cannot be achieved.

2.2. Needs of environmental education and training

Education grounds the process of the sustainable development. In the previous studies, education and training are recognized as crucial and essential ingredients to the achievement of corporate sustainability (Beard, 1996b, Madsen and Ulhøi, 2001, Perron et al., 2006, Daily and Huang, 2001, Wong, 1998, Baumgartner and Winter, 2013). Beard (1996a)described environmental training as a tool to raise awareness and consciousness of employees’ behaviour at the first stage, and afterwards, changes in value, beliefs and assumptions. Educating and training employees is an important aspect of any management initiative which encourages employees to develop an environmentally aware manner and make environmentally responsible decisions in the workplace(Baumgartner and Winter, 2013). Establishment of training regarding environmental issues also leads to

a range of benefits such as facilitating corporate social responsibility, a positive public image, compliance with regulatory requirements, employee encouragement to take part in proactive environmental management, job satisfaction among employees (Cook and Seith, 1992) and ultimately, improving firm value through employees' motivation (Edmans, 2012).

2.3. Models of the corporate greening process

A number of models are mapped to illustrate the business greening processes which allows business to estimate, measure and understand its stage in terms of corporate sustainability. To avoid the "toxic trap" of environmental management, Hunt and Auster (1990) outlined the Five-Stage Environmental Developmental Continuum which suggests that there are five stages to categorize companies in terms of environmental management. The intention of environmental management increases through the stage of "beginner" to "fire fighter", "concerned citizen" to "pragmatist", and ultimately, the "proactivist" performs actively with the strongest intention in environmental management. The Hunt and Auster model (1990) also sheds light on the critical elements of achieving proactive environmental performance. Top level support and commitment is important in management practices. One of the barriers to greening the corporation is to change the past or current ideas and practices of the top managers since they are influential people on environmental policy and decision making. Successful management can only be workable if top level decisions and policy can be passed to the unit staff and interface effectiveness between management and operational staff. The model emphasizes that a high degree of employee awareness and training is central to developing an environmental culture at all levels of the organization. Training programmes should target the most common environmental problems that are relevant to the business and employees' works.

The relationship between corporate sustainability strategies, corporate competitive strategies and sustainability strategies was discussed and modelled based on maturity levels of the corporations and the sustainability aspects on economic, ecological and social dimensions (Baumgartner and Ebner, 2010). The needs of organizational learning on sustainability-related knowledge, active involvement in developing employees' awareness and ethical behaviour towards sustainability are highlighted in the model. Firms with different level of maturity perform differently on the sustainability aspects. A four-level maturity was used while the higher the maturity levels are the more the firm has to be considered on causes rather than on effects towards sustainability.

The linkage of education and environment was mentioned in the Six Es model (Marrewijk and Hardjono, 2003). Because of the close linkage of every business with its employees and customers, each firm has to be an educator and should be providing suitable information and educating anyone working for it or purchasing its services and products while training is a kind of indicative tool to fulfil the requirement in the area of education. These corporate environmental management models point out the importance and effectiveness of environmental education and training in linking employees with the environmental responsibility at work and in achieving corporate sustainability. However, the success of the training programmes' productivity and performance advantages is not universal (Perron et al., 2006) and the programs can be costly and time consuming (Cook and Seith, 1992). Training efforts can be nullified if the companies fail to support the training with adequate resources and proper design (Daily and Huang, 2001, Cook and Seith, 1992). Therefore, it is crucial to identify the strategies and approaches in implementing environmental training for employees, in order to benefit the corporations by saving money and time.

2.3.1. Evaluation of training outcomes

Environmental education is defined as a learning process that individuals and community acquire the knowledge, attitudes, values and beliefs, skills and motivation to improve the quality of environment and maintain an ecologically and socially sustainable future

(Bhandari and Abe, 2000). Hill (2006) defined environmental adult education is a way to assist adult learners in enhancing ecological understanding, skills, and dispositions to behave responsibly in relation to our Earth. Adults have opportunities to gather, share experiences, learn from peers, challenge the current assumptions, and create new meaning and knowledge to form an intersection of the environment in terms of sustainability (Hill, 2006). As an example of environmental adult education, environmental training enables employees to build motivation on the back of a strong awareness of the relevance and importance of environmental issues for the individual and organization, and to develop skills and knowledge that allow actions and decisions concerning the environment and minimize the environmental impacts of works (Bird, 1996). By adopting these definitions, I define the optimal outcomes of the environmental education and training is knowledge acquisition, attitudes and behavioural changes toward environment. Evaluating training programmes is a way to tell trainers, corporations and researchers how to improve the training effectiveness. Kirkpatrick and Kirkpatrick (2006) proposed a principle called "The Four Levels Evaluation Principle" to represent a sequence of ways to evaluate training programme. The principle suggested that evaluation of programme should move from one level to the next. The four levels are reaction, learning, behaviour and results. On the level of reaction, evaluation is used to measure how the programme participants react to it such as participants' satisfaction of the programme and their learning motivation. The second level is level of learning which is defined as the extent of how participants change attitudes, improve knowledge, and increase skill because of the training programme. The next level of evaluation is behaviour which means the measurement of behavioural changes as a result of the training programme. Changes can only be occurred if the programme can accomplish the first two levels and create positive attitude towards the desired change with adequate knowledge and skills. Finally, the level of results can be defined as the final results that encouraged by the programme, results such as increased production, enhanced staff moral to the organization, decreased operation cost due to environmental performance. Each of the evaluation levels is important. Therefore, all levels should be evaluated for a training programme since all levels are correlated with each other.

2.3.2. Organizational learning

Training outcome strongly depends on the learning processes of the employees. To innovating new idea and strategies, learning must be integrated into the strategy development process, transformative in nature and transition of individual learning to organizational learning (Kuhn and Marsick, 2005). After capabilities and mind-set are developed by leaders in the form of action learning, transformative learning is "a process of effecting change in a frame of reference." (Mezirow, 1997,p.5) which act as the underlying engine of breakthrough thinking and strategic innovation (Kuhn and Marsick, 2005). Frames of reference refers the structures of assumptions through adults understand their experiences and their life world. After adults shape their cognition, expectations and feelings, they set their "line of action" and allow autonomous thinking (Mezirow, 1997). Different from the environmental education for children, in adulthood, there is stronger resistance to establish autonomous thinking because the foundation of learning need to be strengthen to assist adults understanding new subject contents and establishing new values and beliefs (Mezirow, 1997). There are four processes of transformative learning; they are to elaborate an existing point of view by seeking evidence to support the initial bias; to establish new point of view which to create new meaning schemes for the learners; to transform learners' point of view that results in changes in learners' habit of mind; and finally to transform learners' habit of mind by becoming aware and critically reflective of their initial bias(Mezirow, 1997). Since the changes in attitudes and behaviour happen in the later stages of the learning processes, learners face greater challenges in transforming their points of view and their actions. The relationship among environmental knowledge, attitudes and behaviour can be measured by using the theory of reasoned action and the extended the theory of planned

behaviours, suggested by Ajzen (1985). The planned behaviour theory consist of three major components, the factual knowledge about the environment, social and moral values regarding environmental, as well as social and moral values regarding environment and ecological behaviour intention. Both theories propose that behaviour intention is influenced by attitudes while factual knowledge is a prediction of any attitude. Therefore, behaviour is mediated by intention with the relationship between factual knowledge and behaviour. Behaviour intention is influenced by the subjective norms which are determined by the social and moral values. These interrelations among knowledge, attitudes, values and subjective norms give prediction to the behaviour intention and result in actions(Ajzen, 1985).

Effective learning is an important cause of establishing effective action by individuals, groups and organizations (Argyris, 2004). If learning for sustainability cannot be transferred from individuals to groups, organizations, and finally to society, it will fall into the knowledge abyss (Lozano, 2011). Individuals who change their values, attitudes and behaviours towards environment should contribute more effectively in changing the organizational culture, however, changes in organization culture and values may take a long to occur(Beard, 1996a). By evaluating the training outcomes in terms of knowledge acquisition, changes in attitudes and behaviour, as well as the training impacts at the organizational and social level, effectiveness of the training and approaches can then be assessed.

2.3.3. Factors determining training effectiveness

Effectiveness of training is influenced by a number of variables. Training motivation was tested to be one of the variables that affect the training outcomes. Colquitt et al. (2000,p.678) defined training motivation as the “direction, intensity and persistence of learning-directed behaviour in training contexts.” The authors categorized the variables into individual characteristics and situational characteristics. Individual characteristics included valence or individuals’ beliefs, demographic variables like age and gender, and variables that related to individuals’ job and career, such as job satisfaction (Edmans, 2012) and organizational commitment. On the other hands, situational characteristics included characteristics of the organization (i.e. size, structure, and leadership pattern), climate of the organizations, manager support or peer support for participation in the training programme(Colquitt et al., 2000). Both individual and situational characteristics were tested to have influences on the learning motivation and its outcomes in Colquitt et al. (2000) study.

Failure of transformative changes occurs if the learning content does not fit comfortably in the learners’ existing frames of reference (Mezirow, 1997). Training content is one of the key variables of training effectiveness. Previous studies examined the impact of different types of nature experiences on different learning modes. A study tested the relationship between nature experience types in different approaches (i.e. direct- and indirect approaches) and learning outcomes in terms of environmental knowledge, attitudes and behaviours(Duerden and Witt, 2010). The study suggested that direct exposure to nature enhances affective-based attitudes and intrinsically motivate behaviours while indirect experiences with environment enhance cognitive-based attitudes and extrinsically motivated behaviours(Duerden and Witt, 2010). Thus, adopting appropriate training approaches (i.e. field-based training or indirect experience) with relevant contents can impact the effectiveness of training in terms of its outcomes. By integrating the concepts and idea, a provisional theoretical map was constructed for the study as shown in Figure 1.

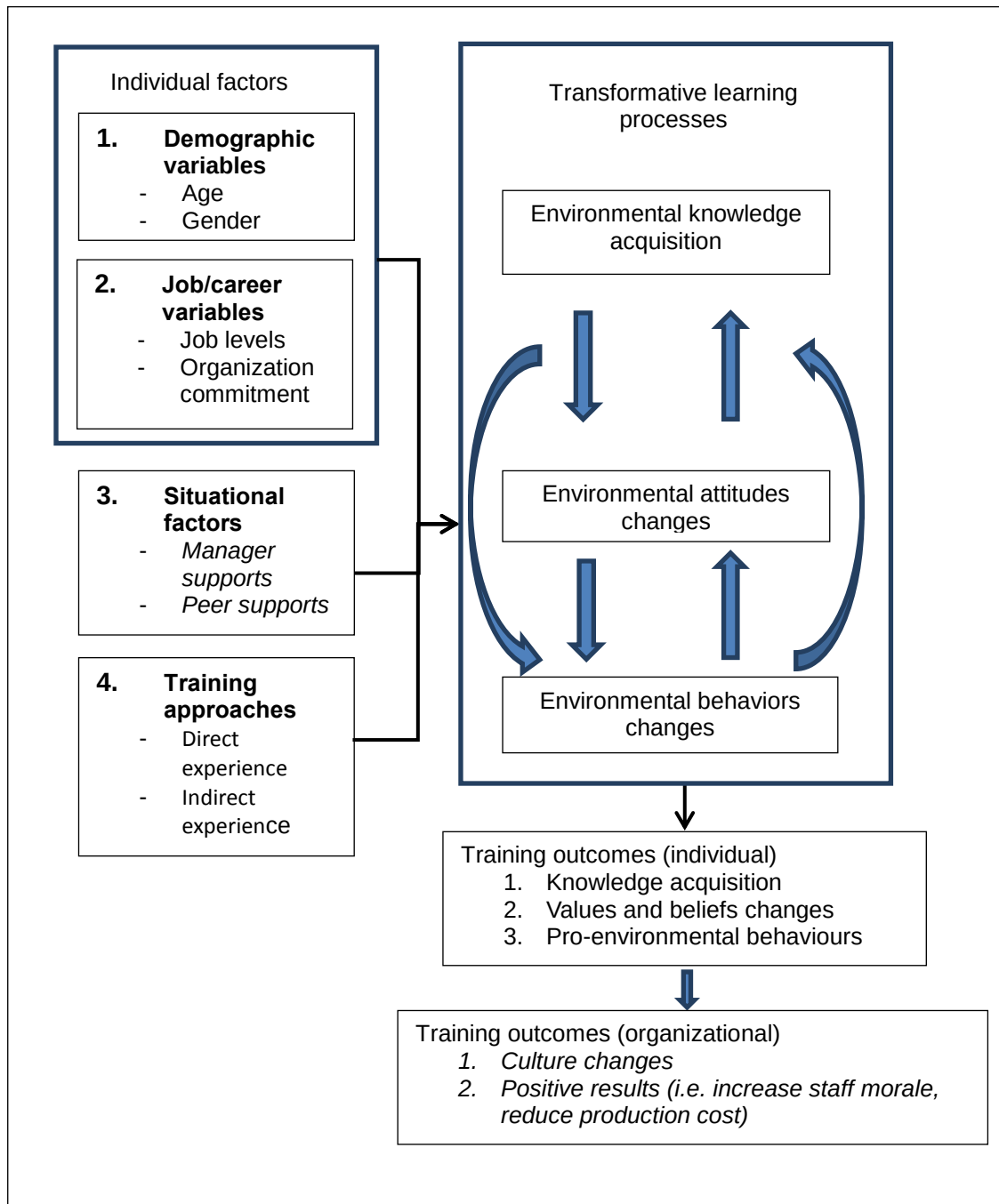


Figure 1: A theoretical map of the evaluation of training effectiveness. Italics indicate that variables were not covered in this paper.

2.4. Research questions

To answer the questions like how to establish effective environmental training efforts and what are the organizational benefits that can be gained from the environmental training, I formulate the null hypotheses as:

H01: The self-rating level of environmental knowledge, attitudes and behaviour are the same after receiving training effort.

H02: The self-rating level of environmental knowledge, attitudes and behaviour are the same among the trainees from different positions in the organization.

H03: The self-rating level of environmental knowledge, attitudes and behaviour are the same as the training hours in field varies.

3. Research methodology

I adopted the case study survey method to investigate the training effectiveness of the environmental education and awareness training. I studied a five-year environmental training programme of an international bank. The study is the evaluation of the training outcomes, in terms of changes of employees' environmental knowledge, attitudes and behaviour before and after the training efforts. Employees were asked to complete an online questionnaire which consists of scales for testing environmental knowledge, attitudes and behaviour levels.

3.1. Case study: The Hong Kong and Shanghai Banking Corporation Limited (HSBC)

The Hong Kong and Shanghai Banking Corporation Limited (HSBC) is a world famous banking and financial services organization which was established in 1865 in Hong Kong and Shanghai (HSBC Holdings plc, 2011b). The parent company of HSBC - HSBC Holdings plc was awarded the Gold Award presented by the Hong Kong Awards for Environmental Excellence in the financial sector in 2008 because of its excellent environmental performance, including the area of staff engagement and environmental training (Hong Kong Awards for Environmental Excellence, 2012). It was ranked on top of all Hang Seng Index (HSI) constituent companies on their Corporate Social Responsibility (CSR) in the CSR Survey of Hang Seng Index Constituent Companies in 2008 and 2009 commissioned by Oxfam Hong Kong and conducted by CSR Asia (Oxfam Hong Kong, 2010, The Hongkong and Shanghai Banking Corporation Limited, 2011). Thus, HSBC can be recognized as the "proactivist" who performs actively with the strongest intention in environmental management and in organizing environmental training for employees, based on Hunt and Auster Model (1990). HSBC is qualified to be studied as a case in this study.

3.1.1. Background of studied training programmes

Business is more interested in biodiversity and ecosystem services nowadays (Corporate Social Responsibility in Asia, 2011). This study aims to evaluate the strategies, formats and the effectiveness of different field-based environmental training programmes by using HSBC's three environmental awareness training programmes as a case study. Programmes include: the *HSBC Climate Banker Staff Training and Awareness Building Programme* and the *Train-the-HSBC Eco-trainer Programme* as a part of the HSBC Climate Partnership, as well as the *Global Forest Observatory: One-day Volunteer Training Programme* which was launched in 2011. The HSBC Climate Partnership is a 5 year commitment of US \$100 million to work with different environmental groups in different regions of business (HSBC Holdings plc, 2011b). The programme aim to reduce the impact of climate change on ecosystems and people, and accelerate the adoption of low-carbon policies by supporting scientific research and policy making, as well as to raise the awareness of employees on the business implications of climate change (HSBC Holdings plc, 2011a).

3.1.1.1. HSBC Climate Banker- Staff Training and Awareness Building Programme

The HSBC Climate Banker was a key staff engagement programme of the HSBC Climate Partnership for its employees in Hong Kong. The Kadoorie Institute of the University of Hong Kong organized this staff engagement programme. The programme aimed to raise the participants' awareness and change their values on understanding the importance of biodiversity in maintaining eco-systems, establishing appreciation of local biodiversity, and experiencing field based ecological research and conservation work. After the training, participants were expected to have obtained basic understanding about corporate sustainability in HSBC as one of the training outcomes.

This training programme was run as a number of two-day residential field camps at the residential facilities of the University of Hong Kong in Yuen Long. A range of educational and experiential learning workshops were held in the camps, including field trips and

lectures as different aspects of environmental issues. Through the training, HSBC employees studied the ecological value of major habitats in Hong Kong such as hillside forests, rocky shores, mangroves and freshwater streams. The programme also allowed employees to take part in conservation work with researchers and conservationists like green NGOs. Other training elements included lectures about Hong Kong biodiversity and debate sessions on environment-related current environmental affairs like fly tipping in rural areas and sustainability issues. Thus, both direct experiences (i.e. field trips and volunteer works in nature) and indirect experiences (i.e. lectures and debate sessions) toward environment were included in this training programme.

3.1.1.2. Train-the-HSBC Eco-trainer Programme

The Train-the-HSBC Eco-trainer programme was an advanced training exercise launched in 2011-2012 as a new initiative after the Climate Banker programme. The programme aimed to provide in-depth training to the potential employees who wished to equip themselves with specific and advanced knowledge and skills that relate to ecology and environmental issues. With these developed knowledge and skills, they can build environmental awareness in the company, as well as the community by guiding thematic nature tours for their colleagues and families.

The training consisted of five intensive training days including three field training sessions with lectures and field trips, and an overnight residential camp for preparing the final assessment. Participants were divided into three groups, according to their interests on different species taxa groups (birds, butterflies, and amphibians and reptiles). The training content covered the wildlife ecology in Hong Kong with advanced knowledge in biology, practical knowledge on controversial environmental issues and sustainable development. Other skills like map reading, route design and wildlife photography were also covered in this programme. Throughout the programme, quizzes and essay assignments were used to assess participants' knowledge and skills. At the end of the training, the participants were asked to organize and guide a thematic nature tour for their colleagues, family members and friends as a practical assessment. Therefore, this programme was advanced environmental awareness training as the training contents were more technical and more commitment was required for the training. Participants had stronger connection with nature through this programme because the training focused on species identification and nature tour guiding skills which require on-site training in the natural environment.

3.1.1.3. Global Forestry Observatory One-day Volunteer training

A project called "Global Forest Observatory: Public Involvement and Training in Scientific Research in Hong Kong" was initiated by the Kadoorie Institute of The University of Hong Kong and received a 3 years donation from the Hong Kong Bank Foundation (2011-2014). The key objectives of this project are to establish a 20-hectare observatory forest plot in the Tai Po Kau Nature Reserve to conduct a wide variety of forest and climate change related research work; and to provide education and training opportunities in a 1-hectare demonstration plot in Shek Kong, Yuen Long. One of the important goals of this scientific research project is to promote "citizen scientist" all-around the city, which means to educate and train local citizens to become "professional volunteers" whose contribute themselves in international scientific research. The Institute organizes a number of training workshops to HSBC employees, teachers, students and green groups. Workshops consist of scientific forest research work in the observatory plot, lectures about forest science, ecological restoration, climate change and sustainability, and field training on plant identification. This volunteer training links the employees to scientific research in nature and provides direct experiences in the natural forest. Indirect experiences are less focused in this programme because participants spend most of their time to work in the forest.

3.2. Evaluating the training outcomes of Environmental Awareness Training program

3.2.1. Environmental knowledge, attitudes, and commitment of employees after the training efforts

This study adopted the four-level evaluation principle, which addressed the sequence of ways to evaluate programmes (Kirkpatrick and Kirkpatrick, 2006). This study evaluated level two, three and four of evaluation, which are Learning, Behavior and Results (Kirkpatrick and Kirkpatrick, 2006). Three HSBC environmental education and awareness training programmes, the *Climate Banker*, the *Train-the-HSBC Eco-trainer*, and the *GFO Volunteer programme* were evaluated in this study.

Each selected HSBC (Hong Kong) employee who participated in the *three* studied programmes was invited to complete an online questionnaire. I used a web-based questionnaire because it is a convenient and timesaving survey method, especially for the business sector. Furthermore, completing questionnaires on the web can elicit higher levels of honesty about social behaviour or experience (Keijzers, 2002). The survey was conducted in an anonymous way in order to encourage employees to report their real feelings about the company in a business survey (Dean and McMullen, 2007). The previous studies suggested the evaluation should be conducted after at least three months of the training effort to allow time for behaviour change and results to take place (Kirkpatrick and Kirkpatrick, 2006, Perron et al., 2006). Thus, trainees with less than 3 months after the training effort were not selected in this study. 135 participants were selected randomly to complete the online questionnaire.

Survey questions were grouped into four main areas, which were environmental knowledge, environmental attitudes, environmental behaviour and personal information. Questions were scored by using a seven-point Likert Scale to get quantified data for statistical analysis. Respondents were asked to give their level of agreement on each statement and indicate their frequency of doing the behaviour before and after receiving the training effort for paired-sample comparison.

3.2.1.1. Environmental knowledge

The area of environmental knowledge aimed to assess the environmental knowledge of the employees by asking questions on aspects about environment and development such as global climate change, ecosystem services, biodiversity, sustainable development and corporate sustainability which were covered in the programmes. Multiple-choice questions were used to test the solid knowledge of the respondents; 2-points were given if respondents answered the questions correctly, while 0.5 to 1 point was scored for choices with less merit. Respondents were also asked to give their self-ratings on the level of understanding on environmental topics before and after the training.

3.2.1.2. Environmental attitudes

The area of environmental attitudes aimed to assess the attitudes and awareness of the employees in relation to the training. I adopted the scale of the New Ecological Paradigm (NEP scale) to measure trainees' level of awareness on the environment (Dunlap et al., 2000, Milfont and Duckitt, 2010, Arcury, 1990). 12 statements of the 15-items NEP scale were used to assess the facets of an ecological worldview on (1) reality of limits to growth, (2) anti-anthropocentrism, (3) the fragility of nature's balance, (4) the possibility of an eco-crisis; while 3 tailor-made statements were used to measure attitudes to biodiversity ranging from local biodiversity to the species loss at global level. Respondents were also asked to give their level of agreement on the statements before and after the training.

3.2.1.3. Environmental behaviour

In the area of environmental behavior, there were questions to assess the behavioral changes of employees after the programme. The frequency of green behaviour at work and in daily life was evaluated before and after the training efforts. Questions were arranged with an ascending level of barriers to act out the behaviours such as energy

saving, waste reduction both at work and at home, organic products consumption, as well as actual actions for conservation and the environment.

4. Results

4.1. Changes in environmental knowledge, attitudes and behaviour

The descriptive statistics for environmental knowledge, attitudes and behaviour scales are provided in Table 1. All samples were normal distributed. Thus, more robust parametric Paired-samples T-test and One-way Analysis of Variance (ANOVA) were used to test the hypotheses.

Comparisons of the means of pre-knowledge and post-knowledge; pre-attitudes and post-attitudes; and pre-behaviour and post-behaviours revealed there were significant differences after receiving the training. Across all 44 respondents (1 response was missing in pre- and post- behaviour measurements), the knowledge level increased about 10.84 points on average (s.d. = 5.93) after the training efforts while the attitude level increased about 9.86 points on average (s.d. = 9.49). The behaviour scale, increased about 8.51 points on average (s.d. = 6.67), which was the smallest increase among the three scales. Results from the correlations of the pair samples, levels of knowledge, attitudes and behaviour were higher overall. On the other hand, the Pearson correlations between pre- and post- attitude measurements ($r=.492$, $p=.001$) and behaviour measurements ($r=.810$, $p=.000$) were statistically significant while the pre- and post-knowledge measurements ($r=.294$, $p=.053$) was marginally significant. The results indicated that all respondents consistently established a higher level of knowledge, attitudes and behaviour because of the training efforts. The significance values for the changes in three measurement levels were statistically significant as the p-values are less than 0.05.

Table 1: Paired-sample T-tests of pre- and post- knowledge, attitudes and behaviour levels

				Correlation		Paired Differences			
	Mean	N	s.d.	R	Sig.	Mean	s.d.	t	Sig.
Pre-knowledge	14.95	44	4.80	0.294	0.053	10.8409	5.9296	-12.127	0.00
Post-knowledge	25.79	44	5.16						
Pre-attitudes	74.13	44	10.08	0.492	0.001	9.8636	9.4858	-6.897	0.00
Post-attitudes	84.00	44	8.53						
Pre-behaviour	33.18	43	11.29	0.810	0.000	8.5116	6.6739	-8.363	0.00
Post-behaviour	41.69	43	9.96						

The Pearson correlation coefficient measured the linear association among the three variables (environmental knowledge, attitudes and behaviour) and the results are shown in Table 2.

How did the pre-knowledge, attitudes and behaviour levels affect the training outcome in learning transformation? The result suggested that the level of pre-knowledge, attitudes level and behaviour were strongly correlated with each other. The level of pre-knowledge was an effect of the acquisition of environmental behaviour after the training efforts ($r=.418$, $p<0.01$) while the pre-attitude level is strongly correlated with the post-attitudes level ($r=.492$, $p<0.01$) and the post-behaviour level ($r=.313$, $p<0.05$). On the other hand, the pre-behaviour level had an appreciated effect on the post-attitude level ($r=.315$, $p<0.05$) and the post-behaviour level ($r=.810$, $p<0.01$). Thus, the results indicate that the

intention of developing environmental behaviour was significantly affected by the respondents existing knowledge, past values and current practices. In addition, the change in environmental attitudes after the training efforts was influenced by the existing point of views and practices, the same as the behaviour intention.

The question on whether and how transformation of learning occurs through the training can be answered by the correlation coefficients among the post-measurements. To investigate the relationship with knowledge and attitudes, the results suggested that with higher post-knowledge level, there are statistically significant effects on the post-attitudes ($r=.330$, $p<0.05$). On the other hand, the correlations were stronger in behaviour with knowledge and attitude levels. The post- knowledge and attitudes were appreciated effects on the environmental behaviour acquisition after the training (Post-knowledge: $r=.420$, $p<0.01$; Post-attitudes: $r=.459$, $p<0.01$).

Table 2: Pearson correlations among the pre- and post- measurements levels

		Pre-knowledge	Post-knowledge	Pre-attitude	Post-attitude	Pre-behaviour	Post-behaviour
Pre-knowledge	Pearson Correlation	1	.294	.326*	.203	.537**	.418**
	Sig. (2-tailed)		.053	.031	.186	.000	.005
	N	44	44	44	44	43	43
Post-knowledge	Pearson Correlation	.294	1	-.262	.330*	.101	.420**
	Sig. (2-tailed)	.053		.085	.029	.521	.005
	N	44	44	44	44	43	43
Pre-attitude	Pearson Correlation	.326*	-.262	1	.492**	.592**	.313*
	Sig. (2-tailed)	.031	.085		.001	.000	.041
	N	44	44	44	44	43	43
Post-attitude	Pearson Correlation	.203	.330*	.492**	1	.315*	.459**
	Sig. (2-tailed)	.186	.029	.001		.040	.002
	N	44	44	44	44	43	43
Pre-behaviour	Pearson Correlation	.537**	.101	.592**	.315*	1	.810**
	Sig. (2-tailed)	.000	.521	.000	.040		.000
	N	43	43	43	43	43	43
Post-behaviour	Pearson Correlation	.418**	.420**	.313*	.459**	.810**	1
	Sig. (2-tailed)	.005	.005	.041	.002	.000	
	N	43	43	43	43	43	43

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

The results were matched with findings from previous studies. Gaining in knowledge is much easier than altering habits or even developing the intention of behaviour (Arcury, 1990, Beard, 1996b, Barr and Gilg, 2007). The first step of training should be to help people to see and recognize their behaviour and past experience by providing facts, data and theories (Beard, 1996a). Bush-Gibson and Rinfret (2010) highlighted the primary goal in environmental adult learning is to acquire content by integrating new information and concepts into existing experiences and knowledge, and finally to restructure the current schema. The correlations among the pre-measurement levels suggested that the performance of the training outcomes was highly affected by the past experiences and knowledge of the trainees. This result corresponded to the suggestion of Mezirow Transformative Learning Theory which suggest the first step of learning processes is to elaborate existing points of view (Mezirow, 1997). Therefore, to ensure effective training efforts, background information and facts about environmental issues and problem should be given to employees before or during environmental training.

Based on the Transformative Learning Theory (Mezirow, 1997), environmental learning is a dramatic shift in perceptions that transforms adults' understanding of environmental issues, their attitudes and behaviour toward the environment. Therefore, knowledge acquisition is a first critical step in providing environmental education and training which is the determining factor in the transformation of environmental attitudes and behaviour. The studied programmes significantly promoted the knowledge gain in the first place.

Knowledge acquisition is critical in the training because the results suggest that environmental knowledge level after the training strongly correlate with obtaining attitudes and behaviour toward environment which can facilitate the transformation of environmental learning.

The correlations of post- behaviour measurement with the level of knowledge and values are also matched with the theory of reasoned action, which proposed by Ajzen (1985). The theory suggests that both factual knowledge and social and moral values affect and lead to behaviour intention and planned behaviour. The result also corresponds to the more defined model that suggested by Kaiser et al. (1999). The authors propose a model that environmental knowledge and environmental values explain 40 per cent of the variance of ecological behaviour intention (Kaiser et al., 1999). Thus, it shows that level of knowledge and attitudes toward environment can be used to explain the tendency in developing green behaviour.

4.2. Training approaches

Many managers struggle about the training targets of environmental training, whether the training should focus on selected people from management level in the organization or should provide training for people from different strata as a whole. Thus, I examined the effect of organization level of the respondents to the training efforts in environmental knowledge, attitude and behaviour. The significance value of the F-test in the change in knowledge level compared with the job position in the organization is .531 ($F=.838$) which shows that there is no significant difference among groups of job position. Moreover, job position is not a significant determinant of the change difference of attitude and behaviour levels among the respondents since both the significant values are greater than 0.05 and the null hypotheses are accepted ($F=.340$, $p=.340$; $F=.428$, $p=.826$). The results can answer the research question that if the corporations provide environmental education and training for their employees, it is not necessary to only focus on the managers. Job position of respondents is not a key factor determining the training performance. Meanwhile, training for general staff may have a better result as this can facilitate the changing of the corporate culture as a whole concept (Beard, 1996a) by facilitating a workable interface between employees and the organization (Hunt and Auster, 1990).

4.3. Training in the field

Cost-effectiveness of money is one of the common concerns of environmental managers in related to the design of approaches to environmental education and training. In general, organizing and providing direct experience trainings is more costly and demanding in administration and resources. Do the field-based training is worth to do so? The impact of direct experiences (such as outdoor, experiential training) on changes in environmental knowledge, attitudes, and behaviour level was tested in this study. The percentage of training hours in field to the total training hours was used to compare the change in knowledge, attitude and behaviour level by using One-way ANOVA. The results suggest that the change in environmental knowledge and attitudes were significantly different with the groups of training hours in field ($F= 4.987$, $p=.012<0.05$; $F=5.896$, $p=.006<0.05$) while the significant value of the change in behaviour was marginally significant ($F=3.172$, $p=.053$). I used the means plots to learn more about the structure of the differences. From the means plot of the change in environmental knowledge, attitudes and behaviour (Figure 2), it appears that the greatest mean of change resulted when the proportion of field-based training is 50-74% to the total training hours. This suggests that direct experiences in nature when having environmental education have better results in knowledge acquisition and green attitudes and behaviour change. The optimal weighting of direct and indirect experiences in the training was found to be half-and-half. This result is matched with the findings of previous studies (Duerden and Witt, 2010). Direct experiences in nature is beneficial to achieve the training outcome by developing affective-based attitudes and to motivate behaviour, while indirect experience is beneficial for knowledge acquisition, leading to cognitive-based attitudes and extrinsically motivated

behaviour (Duerden and Witt, 2010). Based on the research findings, integrated training approaches with direct and indirect experiences are beneficial to the training outcome.

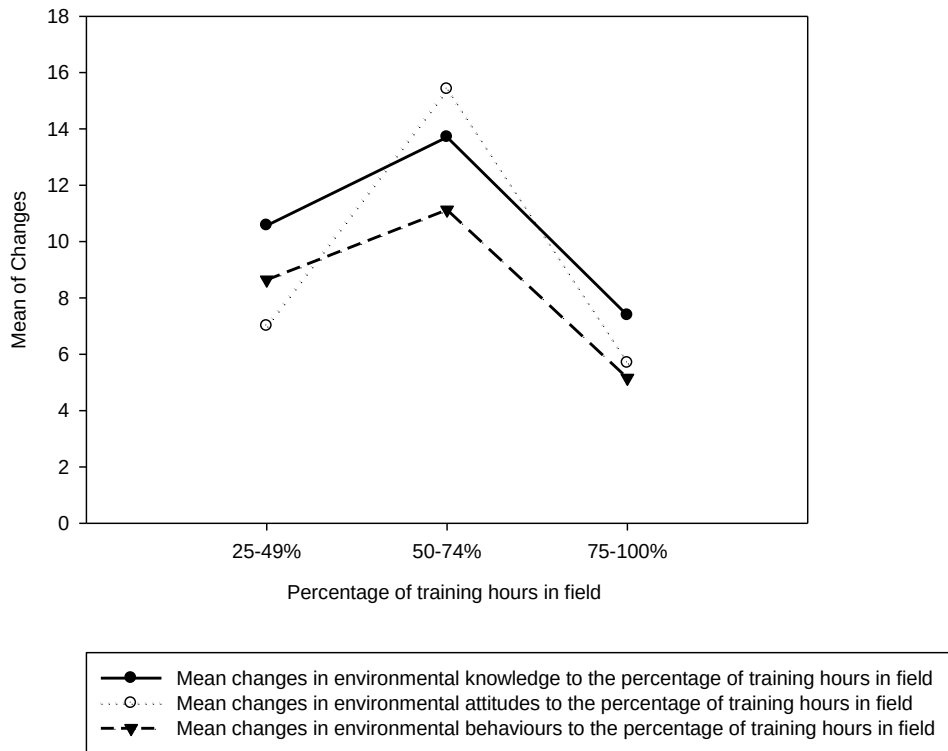


Figure 2: Means plots of change in environmental knowledge, attitudes and behaviour to the percentage of training hours in field

5. Conclusions and recommendations

This study addresses how environmental education and training 'greens' people by changing their knowledge, attitudes and behaviour toward environmental issues and leads to green corporate culture. A series of environmental awareness building programmes were studied and training outcomes were evaluated. Results reveal that respondents showed significant increases in the level of environmental knowledge, attitudes and behaviour which can facilitate the transformation of environmental learning. Existing or current knowledge structures, habits of mind and, especially the current practices were the obstacles to achieving training outcomes. To enrich the effectiveness of the training, the primary goal is to achieve knowledge acquisition to strengthen the transformative pathway to attitude development, and even behavioural intentions. I suggest the environmental education and training should not only focus on the management level since the results show that there was no significant change among groups of working position in the organization. Moreover, the training content should contain both direct experiences and indirect experiences. Employees should have a chance to contact with nature to gain first-hand experiences of the environmental issues or problems. On the other hand, they should also receive solid knowledge such as theories, facts and data through indirect experiences in lectures or seminars. The combination of direct- and indirect- experience performs better because it provides chances for both the attainment and application of environmental knowledge and attitudes, and therefore, effectively promotes pro-environmental behaviour of the employees. Finally, the transition of the business culture can be achieved.

The sustainability transition is a long process. The findings suggest suitable ways in preparing environmental education and training such as having direct-and indirect experiences in the training, training employees from all organizational levels. Proper training approaches encourage transformations of peoples' values and behaviour towards the environment. This case study provides an example for the business field in developed and developing countries. For the organizations that plan and implement environmental education and training, time and resources can be saved for promoting transitions by having effective training with properly designed training strategies.

Acknowledgements

I would like to thank the Hong Kong and Shanghai Banking Corporation Limited and all the participants of the three training programmes (Climate Banker, Train-the HSBC Eco-trainer and the GFO volunteer programme) for their kind support and consideration in this study.

References

- Ahmad, W., Soskolne, C. L. & Ahmed, T. 2012. Strategic thinking on sustainability: challenges and sectoral roles. *Environment, Development and Sustainability*, 14, 67-83.
- Ajzen, I. 1985. From intentions to actions: A theory of planned behavior. In: KUHL, J. & BECKMAN, J. (eds.) *Action-control: From cognition to behavior* Berlin and New York: Springer- Verlag.
- Arcury, T. 1990. Environmental attitude and environmental knowledge. *Human Organization*, 49, 300-304.
- Argyris, C. 2004. Reflection and beyond in research on organizational learning. *Management Learning*, 35, 507-509.
- Bansal, P. 2002. The corporate challenges of sustainable development. *Academy of Management Executive*, 16, 122-131.
- Barr, S. & GILG, A. W. 2007. A conceptual framework for understanding and analyzing attitudes towards environmental behaviour. *Geografiska Annaler: Series B, Human Geography*, 89, 361-379.
- Baumgartner, R. J. & EBNER, D. 2010. Corporate sustainability strategies: Sustainability profiles and maturity levels. *Sustainable Development*, 76-89.
- Baumgartner, R. J. & Winter, T. 2013. The sustainability manager: A tool for education and training on sustainability management. *Corporate Social Responsibility and Environmental Management*.
- Beard, C. 1996a. Environmental awareness training: Three ideas for greening the company culture. *Eco-Management and Auditing*, 3, 139-146.
- Beard, C. 1996b. Environmental training: emerging products. *Industrial and Commercial Training*, 28, 18-23.
- Bhandari, B. B. & Abe, O. 2000. Environmental education in the Asia-Pacific region: Some problems and prospects. *International Review for Environmental Strategies*, 1, 57-77.

- Bird, A. 1996. Training for environmental improvement. In: WEHRMEYER, W. (ed.) *Greening People: Human Resources and Environmental Management*. England: Greenleaf Publishing.
- Bush-Gibson, B. & RINFRET, S. R. 2010. Environmental adult learning and transformation in formal and nonformal settings. *Journal of Transformative Education*, 8, 71-88.
- Colquitt, J. A., Lepine, J. A. & Noe, R. A. 2000. Toward an integrative theory of training motivation: A meta-analytic path analysis of 20 years of research. *Journal of Applied Psychology*, 85, 678.
- Cook, J. & Seith, B. J. 1992. Designing an effective environmental training program. *Journal of Environmental Regulation*, 2, 53-62.
- Corporate Social Responsibility in Asia 2011. Climate change adaptation: engaging business in Asia. Hong Kong: Corporate Social Responsibility in Asia
- Daily, B. F. & Huang, S. 2001. Achieving sustainability through attention to human resource factors in environmental management. *International Journal of Operations & Production Management*, 21, 1539-1552.
- Dean, T. J. & McMullen, J. S. 2007. Toward a theory of sustainable entrepreneurship: Reducing environmental degradation through entrepreneurial action. *Journal of Business Venturing*, 22, 50-76.
- Duerden, M. D. & Witt, P. A. 2010. The impact of direct and indirect experiences on the development of environmental knowledge, attitudes, and behavior. *Journal of Environmental Psychology*, 30, 379-392.
- Dunlap, R. E., Van Liere, K. D., Mertig, A. G. & Jones, R. E. 2000. Measuring endorsement of the new ecological paradigm: a revised NEP scale. *Journal of Social Issues*, 56, 425-442.
- Dyllick, T. & Hockerts, K. 2002. Beyond the business case for corporate sustainability. *Business Strategy and the Environment*, 11, 130-141.
- Edmans, A. 2012. The link between job satisfaction and firm value, with implications for corporate social responsibility. *Academy of Management Perspectives*, 26, 1-19.
- Elkington, J. 1998. Partnerships from cannibals with forks: The triple bottom line of 21st-century business. *Environmental Quality Management*, 8, 37-51.
- Hart, S. L. 1997. Beyond greening: Strategies for a sustainable world. *Harvard Business Review*, January-February.
- Hill, R. J. 2006. Environmental adult education: Producing polychromatic spaces for a sustainable world. *Global issues and adult education: Perspectives from Latin America, Southern Africa, and the United States*. San Francisco, CA, US: Jossey-Bass, San Francisco, CA.
- Hockerts, K. 2001. Corporate sustainability management—Towards controlling corporate ecological and social sustainability. *Sustainability at the Millenium: Globalization*,

Competitiveness and the Public Trust, 2001 ninth International Conference of Greening of Industry Network. Bangkok.

- Hong Kong Awards for Environmental Excellence. 2012. *2011 Hong Kong Awards For Environmental Excellence Sectoral Awards Result* [Online]. Hong Kong: Hong Kong Awards for Environmental Excellence. Available: <http://www.hkaee.org.hk/questcms/main/main.php?obj=329&page=1&kw=&ii=&ci=&theme=default&lg=en> [Accessed 20 February 2013].
- HSBC HOLDINGS PLC 2011a. HSBC Climate Partnership Review 2010. United Kingdom: HSBC Holdings plc.
- HSBC HOLDINGS PLC. 2011b. *Sustainability Report 2010* [Online]. United Kingdom: HSBC Holdings plc. Available: [http://www.hsbc.com.hk/1/PA_1_3_S5/content/cr/common/pdf/sr_2010/HSBC Sustainability_Report_2010.pdf](http://www.hsbc.com.hk/1/PA_1_3_S5/content/cr/common/pdf/sr_2010/HSBC_Sustainability_Report_2010.pdf) [Accessed 3 February 2012].
- Hunt, C. B. & Auster, E. R. 1990. Proactive environmental management: Avoiding the toxic trap. *Sloan Management Review*, 31, 7-7.
- Kaiser, F. G., Wölfling, S. & Fuhrer, U. 1999. Environmental attitude and ecological behaviour. *Journal of environmental psychology*, 19, 1-19.
- Keijzers, G. 2002. The transition to the sustainable enterprise. *Journal of Cleaner Production*, 10, 349-359.
- Kirkpatrick, D. L. & Kirkpatrick, J. D. 2006. *Evaluating training programs: The four levels*, California, Berrett-Koehler Publishers.
- Kuhn, J. S. & Marsick, V. J. 2005. Action learning for strategic innovation in mature organizations: key cognitive, design and contextual considerations. *Action Learning: Research and Practice*, 2, 27-48.
- Lozano, R. 2011. Creativity and organizational learning as means to foster sustainability. *Sustainable Development*, n/a-n/a.
- Madsen, H. & Ulhoi, J. P. 2001. Greening of human resources: environmental awareness and training interests within the workforce. *Industrial Management & Data Systems*, 101, 57-65.
- Marrewijk, M. V. & Hardjono, T. W. 2003. European Corporate Sustainability Framework for Managing Complexity and Corporate Transformation. *Journal of Business Ethics*, 44, 121-132.
- Mezirow, J. 1997. Transformative learning: Theory to practice. *New Directions for Adult and Continuing Education*, 1997, 5-12.
- Milfont, T. L. & Duckitt, J. 2010. The environmental attitudes inventory: A valid and reliable measure to assess the structure of environmental attitudes. *Journal of Environmental Psychology*, 30, 80-94.
- Montiel, I. 2008. Corporate social responsibility and corporate sustainability. *Organization & Environment*, 21, 245-269.

- Norman, W. & MacDonald, C. 2004. Getting to the bottom of "triple bottom line". *Business Ethics Quarterly*, 14, 243-262.
- Oxfam Hong Kong 2010. CSR Survey of Hang Seng Index Constituent Companies 2009. Hong Kong: Oxfam Hong Kong.
- Perron, G. M., Cote, R. P. & Duffy, J. F. 2006. Improving environmental awareness training in business. *Journal of Cleaner Production*, 14, 551-562.
- Stringer, L. 2009. *The Green Workplace*, Palgrave MacMillian: New York.
- The Hong Kong and Shanghai Banking Corporation Limited. 2011. *Sustainability at HSBC* [Online]. Hong Kong The Hongkong and Shanghai Banking Corporation Limited. Available: http://www.hsbc.com.hk/1/2/cr/sustainability_at_hsbc/awardsranking [Accessed 20 February 2013].
- Wikström, P. A. 2010. Sustainability and organizational activities – three approaches. *Sustainable Development*, 18, 99-107.
- Wong, W. Y. L. 1998. A holistic perspective on quality quests and quality gains: The role of environment. *Total Quality Management*, 9, 241-245.