Spending time at an environmental education centre – An investigation into changes in pro-environmental behaviour

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Abstract: This thesis explores the impact one's epistemology and preferred learning methods may have on the uptake of pro-environmental behaviour. Educational literature has expounded the benefits of situated learning. Nonetheless, proponents of environmental education seem to largely ignore this method in adult learning. Thus, this research explores the impact of spending time at a leading environmental education centre – the Centre for Alternative Technology (CAT) - on one's behaviour. The overall findings showed that there was a significant majority of respondents whose uptake of pro-environmental behaviours increased for up to 3 months, after a stay of four to seven days at CAT. Despite the increase in pro-environmental behaviour overall, the Rebound Effect was still found to be evident in some participant's behaviour.

Keywords: environmental behaviour; rebound effect; social norm theory; environmental education

> *'Tell me, I forget. Show me, and I remember. Involve me, and I understand.'*
> Chinese Proverb, cited by The Trapeze Collective, 2007, p. 108

1. INTRODUCTION:

The objective of this paper is to go outside the usual parameters of mainstream behavioural change methodology, practised by the British Government and Non-Governmental Organisations (NGOs), by exploring methodologies from Constructivist epistemology to attempt to understand how best to motivate individuals to develop environmentally responsible behaviour in their everyday lives.

Despite efforts by NGOs, International Governments and environmental campaigners to combat climate change, atmospheric CO_2 was at its highest ever level of 392.39 ppm in August 2011 (Mauna Loa Observatory: NOAA-ESRL, 2011.) Although increasingly proficient technology to enable the population to live lower carbon lifestyles is available, the uptake in utilising these technologies and pro-environmental behavioural change is slow. Increasingly it seems that whilst individuals are aware of climate change they fail to act on it (Leiserowitz, 2007, cited in Tan et al, 2008, p. 8). This is often referred to as a 'value-action' gap: a barrier that limits the success of Government led environmental communications. A change in approach of environmental education and communication to create a 'tipping point' in behaviour is necessary, to enable environmentally responsible behaviour to become the norm and creating political space for further ambitious environmental laws. This paper explores participatory environmental education, through individuals staying at an environmental education centre (the Centre for Alternative Technology (CAT)). The behaviour of the visitors is monitored before and after their attendance through questionnaires. Interviews were conducted to help to evaluate why behaviour may, or may not, have changed as a result of the visit.

2. ENVIRONMENTAL BEHAVIOURAL CHANGE RESEARCH:

There are many methods of environmental communication used by Governments and campaigners, such as scaring people about the outcomes of climate change, making them feel guilty about their actions, or providing more information on the issue. A

growing body of research shows these methods simply do not work (Hungerford and Volk, 1990; Platt & Retallack, 2009; Fuetrra Sustainability, 2010; Whitmarsh & O'Neill, 2011; Crompton 2008). Worse, they can make individuals angry or ambivalent (Futerra Sustainability, 2010; ESPACE, 2007).

The European Spatial Planning: Adapting to Climate Events (ESPACE) project conducted large scale surveys between 2004 and 2006. They found that people cannot be scared into doing something about climate change if they do not know how their actions can make a difference (2007). Communications that involve guilt have little effect, such as the 2009 Government campaign, involving a bed time story with pet dogs drowning. IPPR research has shown that individuals can 'turn off' at the mention of climate change. '*It's* [climate change] *one of those things you think about for a few minutes get depressed and move on to the next.*' (Male, Bristol, with children) (Platt & Retallack, 2009, p. 16).

Furthermore, focusing on the negative outcomes of climate change could dominate one's availability heuristic. Rather than encouraging people to change their behaviour, focusing on catastrophic global warming outcomes could subconsciously make people less likely to act (Fuetrra Sustainability, 2010; Marx et al, 2007). Essentially, existing communication campaigns have raised awareness of the issues; however they have done little to address the psychological or structural barriers to behaviour change (Whitmarsh & O'Neill, 2011, p. 5).

It is proposed that there is a need for increased knowledge of **how** to tackle climate change on an everyday basis. Thus, more attention should be paid to theories of knowledge and how people learn. The majority of environmental communication (to adults) goes through channels such as websites, posters, emails and newspapers. Despite 'learning through doing' being expounded by teachers in formal settings (such as schools) as part of an effective learning program, environmental educators and campaigners seem to ignore this method of learning in non-formal settings.

3. EPISTOMOLGY

An early and widely accepted model of Environmental Education (EE) was described by Ramsey and Rickson (1977, cited in Hungerford and Volk, 1990, p.9):
'Increased knowledge leads to favourable attitudes... which in turn, lead to action promoting better environmental quality.'
This premise relies on individuals making rational decisions about their behaviour that affects the environment, rather than a lot of behaviour being habitual. It also assumes individuals are 'empty vessels' waiting to receive information that will propel them into rational action (Whitmarsh & O'Neill, 2011). The majority of communication campaigns still rely on this method of learning. Unfortunately, increased knowledge of the issue has failed to ignite the necessary changes in society.

Constructivist epistemology is based on two fundamental principles: firstly knowledge is not passively received but actively built up by the cognizing subject; secondly, the function of cognition is adaptive and serves the organisation of the experiential world (Von Glasersfeld, 1994, cited in Robertson, 1994, p. 23). Constructivism appears particularly relevant to education on environmental issues since '*learning is not about filling empty heads or acquiring new ideas, but about students developing or changing their existing ideas'* (Bell, 1993, cited in Robottom 2004, p. 95). Adults have complex clusters of ideas, beliefs, values, and emotions which they use to understand the world (Snively, 1986, cited in Robertson, 1994, p. 25) thus the lessons they have learned and their life experiences, cannot be disregarded in environmental learning. Consequently, any learning that takes place must acknowledge these existing cognitive commitments, and the relativity of new instructional inputs must be taken into consideration. To alter this behaviour, you must first recognise there is a habit in place and provide experience and inspiration to change this habit. A maintained shift in behaviour is unlikely to occur if one is told once that all appliances should be turned off, for example, but, if you can involve the learner in an activity or experience that may induce a cognitive commitment to remember to turn off the appliance it could be more likely that they engage in that action.

In essence Constructivist theories respond to individuals being thinking, feeling human beings with existing habits and opinions. Acknowledging the context of the lives of the population, such as barriers to change, seems far more likely to allow for communication strategies to appear pertinent and applicable to individuals rather than hectoring. Constructivist philosophies see the interaction with the everyday influencing how one learns, thus situated learning appears to be the perfect proponent of this epistemology.

3.1 Learning styles

The importance of learning styles has been well established in educational literature (Hughes, 1999; Smith 1999). Whilst still being debated, research shows that the population is divided into auditory, visual and kinaesthetic learners with roughly a third of the population to each style of learning (Felder and Silverman, 1988). A learning style is the preferred method of a learner; or the way in which a learner tries to cognize information. These styles are not exclusive, as learners can learn through more than one style, but may learn best through one in particular, for example auditory learning. It is suggested that the majority of the population only receive information on how to combat climate change through auditory or visual learning (newspapers, television programmes etc). If a third of the population learn best through kinaesthetic learning, perhaps environmental behaviour could be increased by opportunities to practise environmental actions and it is the aim of this thesis to evaluate this theory. The advantage of using an environmental education centre to engage individuals in pro-environmental behaviour is that it covers **all three** learning methods, increasing the chance of effectively communicating to individuals to change behaviour.

4. BEHAVIOURAL CHANGE MODELS

Hines et al's (1986) behavioural change model is often cited as a coherent basis of behavioural change (see Figure 1). Despite this being formulated 25 years ago Government campaigns often only address certain variables: knowledge of issues and knowledge of action. It is evident that there are more contributors to behaviour than those stated and these are grouped together in 'situational factors', such as social pressures and opportunities to choose different actions (Kollmus & Agyeman, 2002, p. 244).
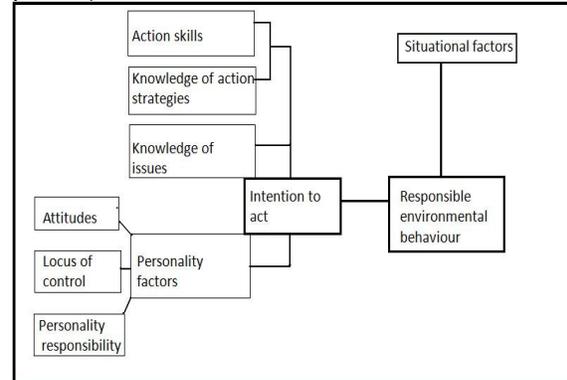

Figure 1: (Hines, Hungerford and Tomera, 1986, p. 7)

In other words situational factors are the contexts of individual's lives. It is suggested that spending time at CAT may provide a new context for individual's behaviour, which even for a short period could have an effect. Whitmarsh and O'Neill (2011) suggest that the successful habit-change interventions involve disrupting the contextual factors that automatically cue habit performance. They state that such a disruption could be moving, changing jobs, or having a baby.

Research conducted by Newton, Franklin, Middleton and Marsden (2009) into the creation of sustainable communities found that situated learning or experiential learning '*was an enlightened way of reviewing skills... notably this is because of the dual priority that the situated learning places on the individual learner, and the **social context** in which the learning takes place.*'(p. 23).

CAT has the potential to disrupt one's 'life context' (if staying there whilst doing a short course) and provides new social circles in which to relate, if only for a short time, and thus a different social norm. It provides affective and cognitive experiences, allowing for the opportunity for those skills to be developed, through situated learning. The premise of this research was to test whether this could effectively change individual's long term behaviour.

5. METHODOLOGY

The methodology was designed to encompass quantitative research (a closed question survey on a Likert Scale regarding the participants environmental behaviour) and qualitative research (open questions regarding why behaviour did or did not change) on a longitudinal scale. The combined research methods were considered particularly important, as hard data was useful to demonstrate if behaviour had changed and qualitative research was used to attempt to demonstrate the meaning participants made of that experience (Seidmean, 2006, p.9). The questionnaire was filled out on arrival at CAT by 110 indivduals attending short courses of four to seven days (Stage One). The same questionnaire was distributed to attendants by email one month after their visit, to see if their answers had changed (Stage Two). Three months after the participant's attendance, six individuals were interviewed (Stage Three).

Through the survey the respondents were questioned regarding whether they performed particular environmental actions and their regularity of occurrence, if they were performed at all. These were, 'Do you: recycle glass, paper & metal; turn off the power at the plug on appliances when not in use; prefer to walk, cycle or use public transport rather than drive short distances; takes flights; take showers instead of baths; compost organic waste; eat meat; garden for wildlife; grow food; buy organic food; use energy saving light bulbs; use environmentally friendly cleaning products; use an renewable electricity provider'.

Scores were given with regards to the frequency of each practised action with "yes, always" scoring 3, "yes, most of the time" scoring 2, and "yes, occasionally" scoring 1. If the attendees did not perform an action a score of zero was recorded. Different reasons for saying no were provided, such as "no time, too much effort, too costly, never really thought about it, other". Within the 13 statements of environmental behaviour, two actions were given that had significant environmentally harmful consequences these were: Do you eat meat;

do you fly for business or leisure. These were scored in the same scale but negatively. So, if a respondent answered "yes, always" they scored -3, "yes, most of the time" -2, or "yes, occasionally" -1. For these questions a "never" option was given, then if this was selected the respondents were given a score of 3 for that question.

In addition, a total environmental behaviour score was calculated for each 'second stage participant' (second stage participant will refer to the 13 individuals who filled out the second stage questionnaire of the study). The highest an individual could score is 39 and the lowest an individual could score would be -6. Figure 2 shows the 'stage two participants' everyday behaviours, before and after they attended CAT. For simpler interpretation of the graph these calculations were converted into percentages. This means that if a respondent answered 'always' to all of the pre-environmental behavioural actions and 'never' to the two environmentally harmful environmental actions they would score 100% on the graph.
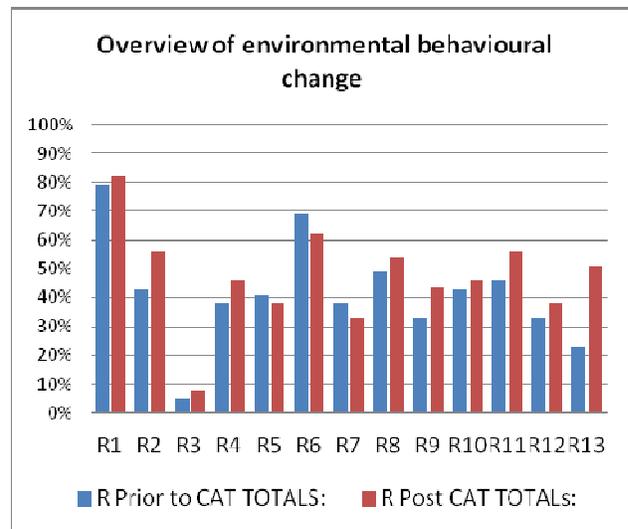

Figure 2: Overview of environmental behavioural change (R = respondent)

6. RESULTS

6.1 Key Findings

Since visiting CAT, ten out of 13 participants increased their pro-environmental behaviour.

Of these, environmental behaviour increased on average from 42 per cent to 47 per cent. Thus the results support the hypothesis that time spent at CAT would increase environmentally responsible behaviour through an interactive and experiential learning process. It should be noted that the behaviour analysed is reported behaviour.

The results showed variances in the amount each individual changed their behaviour. For instance, R13 increased his pro-environmental behaviour by 18 per cent whilst R5 decreased his overall pro-environmental behaviour by three per cent. These statistical variances will be explored in conjunction with the findings from 'stage three' of the research.

The interview process of participants R1, R2, R3, R4, R5 and R6 provided a more in-depth understanding behind the variances in behaviour illustrated in Figure 2. The interviews also facilitated a method to gain some understanding of the meaning participants took from their visit to CAT. Theories surrounding the Rebound Effect, Self-Perception, social norms and types of environmentalists shall be explored below to attempt to analyse why such variances in behaviour occurred. .

7. DISCUSSION OF QUALITATIVE RESULTS

7.1 Rebound Effect

R5 and R6 exemplified the most prominent evidence of the indirect rebound effect, but it was an underlying trend over all the participant's behaviour. An in-direct rebound effect is where one may perform one environmentally friendly action and as a consequence allow oneself to increase another environmentally harmful action, or alternatively reduce the performance of another pro-environmental action (Crompton, 2008, p. 23). R5 increased his energy savings, increased his usage of renewable technology and decreased his meat consumption after his attendance at CAT. However, as well as the increase in pro-environmental behaviour, he decreased other actions that help the environment, such as gardening for wildlife, buying organic food and growing food, resulting in an overall decrease in pro-environmental behaviour of three per cent. An increase in technocentric actions and a decrease in ecocentric actions was actually a trend that was mimicked by the average scores of the respondents in the second stage of the research, through their second stage questionnaire responses. Overall, the frequency with which respondents turned off appliances at the plug increased by eight per cent; the amount of energy saving light bulbs utilised increased by eight per cent; the amount of meat consumed decreased by 13 per cent[1]; the amount people recycled and bought organic food remained the same; all other actions decreased overall in the frequency with which they were performed. Crompton (2008) raised the question whether the motivation that inspired the uptake of an environmentally friendly action would contribute to the occurrence of the rebound effect. The results of this research would suggest that the rebound effect still occurs even if one is motivated by environmental concerns – which it is assumed that CAT would inspire, especially since R5 stated CAT '*having left a huge impression*' and '*the more people who visit CAT and are influenced the better!*' (R5 Interview, November, 2010).

R6, a self stated '*hard-core green*' (R6 Interview, November, 2010), maintained a high score of environmental behaviour of 62 per cent but his pro-environmental score decreased from 69 per cent over 3 months. One could presume that perhaps interviewee R6 did not enjoy his time there, but he stated he found his time at CAT '*excellent*' (Interview, November, 2010). Going on a short course, or increasing other pro-environmental behaviours, could make you feel as though 'you have done your bit', resulting in the rebound effect. Alternatively, other externalities not recorded in the survey could be impacting behaviour. However, more investigation would be needed for any concrete conclusions to be drawn.

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1   The decrease in meat consumption was an anomaly in the findings, being an ecocentric action. This is referred to in section 7.2 Environmentalist types.

7.2 Environmentalist types

Generally environmentalists are referred to in two main trends of environmental behaviour. One being technocentric, who may believe human ingenuity will solve the environmental problem – they are more likely to invest in the newest green gadgets. The other 'type' are ecocentric environmentalists, who are more likely to consider caring for nature and a decrease in consumption as a reaction to climate change problems. In real life, the majority of people will have characteristics of both, but have an inclination to one school of thought. As ten out of the thirteen participants attended various renewable energy courses it may be fair to assume that the participants may have a technocentric inclination. This is reflected in their results with an increase in energy saving activities (eight per cent increase in turning appliances off the plug and using energy efficient light bulbs), but actions such as growing food and gardening for wildlife decreasing. Other externalities should be remembered here such as energy saving activities will also save money on electricity bills.

Meat consumption bucks the trend in the results. Meat eating is often a contentious issue, as many individuals consider their diets unhealthy without meat. A study conducted by De Boer in 2007 found that Europeans give very little thought to how their food consumption affects the planets resources. After attending CAT participants decreased their meat consumption by 13 per cent. This was the largest uptake in pro-environmental behaviour, out of all the options on the questionnaire. The decrease in meat consumption could symbolise learning taken from their stay, through the vegetarian policy practised at CAT.

7.3 Social Dynamics

Personal wants and desires are strongly motivated and influenced by the constraints of society – this is what is called the 'Social Norm' (Downing and Ballantyne, 2007, p. 40). Research has shown that the behaviour and opinions of others have a greater impact on behaviour than participants are willing to admit. CAT exemplifies a more sustainable way of living, as well as introducing individuals to people who live a lower carbon lifestyle. It is suggested this could have a considerable impact on an individual's behaviour.

One item of interest that was depicted at the interview stage of the research was that those that cited the benefits of the social situation at CAT increased their pro-environmental behaviour most significantly. Conversations that took place at CAT could have the benefits of sharing more pro-environmental knowledge, as well as increasing one's sense of pro-environmental social norm by finding out more of what others are doing. R1 commented '*reading about things and hearing arguments (however persuasive) doesn't have the same impact as just seeing someone getting on with it*' (R1 Interview, November, 2010). R1 was inspired by seeing individuals at CAT living in a co-operative environmentally sound way, so much so that R1 is now planning to build an eco-community on his land from straw bales, he bought his own wind turbine and is planning his own forest garden. R2 stated '*I discovered people had made careers out of being green and sharing ideas and stories was invaluable.*' (R2 Interview, November, 2010). R2 proceeded to join environmental community groups when he returned home and jokingly called himself '*the biggest bore in the village*' (R2 Interview, November, 2010), as he wanted to share the knowledge he learnt at CAT. R1 achieved the highest pro-environmental score of 81 per cent and R2 had the biggest increase of those interviewed: 8 per cent.

Research undertaken by the Sustainable Development Commission (SDC) found that individuals need to know they are be acting in collaboration, not in isolation (SDC, 2006, p. 11). CAT, and institutions like it, can be used to demonstrate that others are acting in ways to help the environment (as well as how to do it). It changes the availability heuristic of an individual, allowing them to see others are acting in congruent ways towards the environment.

7.4 Personality Factors

The concept of self-perception may be important in deducing how much individuals take from their experience at CAT, this involves one's attitudes, level of personal responsibility to the environment and one's

perceived locus of control. DEFRA has conducted in-depth research on how personality factors affect one's propensity to uptake pro-environmental behaviours. DEFRA (2008) has profiled seven types of 'environmentalists' and positioned these individuals between ability and willingness to act based on their barriers and motivations for behaviour.

If one relies on this segmentation one implication could be that CAT could be particularly useful to influence 'Cautious Participants'. A statement that could be said to personify this segment is: *'I'd really like to do more... well as long as I saw that others were.'* CAT could be effective in communicating to this segment, since they share the desire to do more (replicated in Positive Greens), but they may not know how to do more. CAT could enable this segment. Furthermore, they need to know that others are also 'doing their bit', which would be symbolised by CAT's existence and their interaction with other people attending CAT. It is possible that respondents R4 and R6 could be grouped into the 'Concerned Ethical' DEFRA segmentation category. 'Concerned Ethicals' are characterised by statements such as *'I think I do more than a lot of people. Still, going away is important, I'd find that hard to give up'.* R6 explained his decision to continue to fly by the price differentiation: '*Rail fares are too high; it is cheaper to fly to Munich, than get a train to London'* (R1, November, 2010). R1 and R2 appeared to demonstrate that they felt their locus of control was strong and thus made a considerable amount of changes in their lives. In contrast, although R6 evidently behaved in ways to help the environment, he perceived his locus of control in environmental issues to rely more upon government intervention. R6 stated that '*I have made as many changes as I am willing to make at this point*' (Interview, November, 2010). This resonates with the statement characterising 'Concerned Ethicals'.

The importance of the variable of locus of control, identified by academics such as Barr (2004) and Hines *et al* (1986), has been again highlighted in this research. Whilst CAT may have illustrated to individuals such as 'Cautious Participants' that they can change their lives to great effect, it did not appear to affect 'Concerned Ethicals' behaviour to the same degree.

8. CONCLUSION

The results of this research have supported the hypothesis that pro-environmental behaviour would increase through experiential learning on environmentally friendly living techniques. CAT, as an environmental learning centre, has the ability to encourage all learning styles (audio, visual and kinaesthetic) through participatory learning.

This research implies that interactive/participatory learning could be more effective than passive learning in environmental education, as it allows individuals to converse, sharing skills and ideas. It also allows individuals to potentially practise environmental action skills allowing greater confidence to integrate these behaviours into their own lives.

There were important limitations to the research that should be clearly noted. There was no question in the questionnaire that referred to the participants preferred learning styles. If the research was to be repeated this should be included. The sample size was small and needs to be greater to substantiate trends found in the research. The sample of those attending CAT were dominated by those with interests in renewable technologies, illustrated by only three individuals who did not attend renewable energy courses taking part in the second stage research. If the research was repeated other methods than just email would be explored to gather the second stage questionnaire results, as this may have influenced which type of people responded. Also, the study was constrained by the short research time-frame, preventing discussion of long-term effects on behaviour. Further research on a greater longitudinal basis, such as regular interviews after CAT attendance for two years, would have provided interesting clarification of intentions translating into actions from the participants. Lastly, the limitations of the research capacity, in terms of time and resources, meant that this piece of research could not

be compared to an experiment surrounding different learning styles.

Considerable further research is required to substantiate trends in this study. More in-depth research into the concurrent occurrence of increased pro-environmental behaviour and Rebound Effect in behavioural trends depicted by attendees is necessary. The relationship between personality types and the Rebound Effect found in this research is interesting and if this was researched further, potentially some conclusions could be drawn to begin to combat the Rebound Effect on a greater scale. The results of research focusing specifically on audience segmentation and increased knowledge of action skills through CAT attendance would be interesting, and would inform consideration of how best to communicate with different segments of society.

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