EVALUATION OF ENVIRONMENTAL EDUCATION

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ABSTRACT

Environmental education is a diverse field, carried out by many different types of organisations and individuals in a variety of formal and non-formal settings. In this era of accountability environmental educators are increasingly being asked to demonstrate the success of their projects through evaluation. In this thesis, I explore evaluation practice within environmental education in the UK from the perspectives of practitioners and their participants.

I used a mixed-methods approach to discover what practitioners and participants feel are the outcomes of environmental education, comparing them with each other and the limited literature on the topic. Practitioners suggested a wide range of different outcomes, which I categorised into outcomes for the environment, for the individual, the wider community and the institution running the project. A particularly diverse range of outcomes for the individual were suggested by practitioners and their participants.

Few studies have examined the evaluation practice of environmental education practitioners, but the literature suggests a lack of a culture of evaluation within the sector. Practitioners in my sample report evaluating their projects more frequently than is reported in the literature. However, I used the Kirkpatrick typology of evaluation to categorise the types of evaluation conducted by these practitioners and revealed that much of this is mainly a fairly superficial assessment of how much participants enjoyed the activities.

The barriers practitioners face to evaluation is another understudied research area, and I divided the barriers discussed by practitioners and participants into methodological and practical barriers. Lack of time is the biggest challenge faced by practitioners, and this has implications for the quality of the evaluations that are conducted.

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DECLARATION

This thesis is composed of original research conducted by Sarah West, under supervision from Mike Ashmore. All information sources have been acknowledged.

No part of this thesis has been submitted for a degree at any other university. A shortened version of Chapter 2 has been published as West, S. E. (2014). Understanding participant and practitioner outcomes of environmental education. Environmental Education Research, 1–16. A shortened version of Chapter 3 has been submitted to the Journal of Environmental Education and is currently under review.

CHAPTER 1: INTRODUCTION

1.1 PREFACE

I have worked as an environmental educator in Yorkshire since 2006. The majority of this time has been spent as a Community Scientist for the OPAL project, helping schools, community groups and individuals take part in the national OPAL surveys of biodiversity and climate, and running regional events, training courses and research projects. Through this project I have worked with many other environmental education practitioners in the region who are delivering both formal (school based) and non-formal environmental education projects. In 2009 I attended a conference where I presented the results of an evaluation I had conducted of a small six week project with teenagers in York. The other practitioners present at the conference were interested in the methods I had used to evaluate the project, and commented on the pressures they were under from their funders to evaluate, and how difficult it was to evaluate education projects, particularly non-formal ones. This inspired me to start this research, working with practitioners and their participants to understand evaluation practice and then to try and develop improved tools for evaluation.

1.2 ENVIRONMENTAL EDUCATION

Environmental education is carried out by many different types of organisations around the world, and can take many forms. These have been categorised as "education *in, about* and *for* the environment" (Davis, 1998, p 118), i.e. the environment can be used as a place or medium for education, it can be used as a subject for investigation, or to teach about conservation and improvement of the environment itself (Palmer 1998). Davis believes environmental education can be a positive counteraction to feelings of doom and gloom and helplessness that people may feel in the face of environmental crises such as global warming and biodiversity loss (Davis 1998).

The global climate is changing; annual global temperatures from the period 1995-2006 were 11 out of the 12 warmest years since records began in 1850. Precipitation patterns are changing, with some areas of the globe (e.g. North America, Northern Europe) seeing an increase in rainfall, and others (such as the Sahel and Mediterranean) experiencing a decrease (IPCC 2007). Despite the overwhelming evidence of these changes occurring, one quarter of people surveyed in a recent UK study felt that the evidence for climate change was unreliable. It is often assumed that this is because the public do not have

sufficient knowledge about environmental issues, but this study found that the values held by individuals was a more important determinant of their scepticism (Whitmarsh 2011). Some of the key objectives of environmental education are to provide people with opportunities to obtain knowledge about environmental issues and the values, attitudes, commitment and skills needed to protect and improve the environment (Unesco 1977). Knowledge about climate change and the mechanisms we can use to help slow it are important as they may help lead to actions which ameliorate the effects it will have on human populations and biodiversity.

Environmental education has the potential to provide people with skills such as species identification. This is vital as we have currently only identified about 10% of the species on Earth, in fact “we do not know how many species of organisms exist on earth even to the nearest order of magnitude” (Wilson 2003, p. 78). Our ability to identify only a small proportion of species on earth is problematic because if we don’t know what things are, we do not know how to protect them. For example, in order to protect ecosystems from habitat destruction, we need to understand how they function, what species are present and what relationships exist between species (House of Lords Select Committee on Science and Technology 2002). Clearly, systematic biology (the science of identifying, naming and researching relationships between living things) is vital for conservation of biodiversity. However, the Select Committee found a worrying decline in funding for systematic biology and conservation research in museums, universities and botanical gardens. Additionally, the Committee reported that little taxonomy (the naming of things) is taught within GCSE, A-Levels or university courses, and increasingly the expertise lies with amateur naturalists (House of Lords Select Committee on Science and Technology 2002). However, this is an ageing population, with a recent survey finding that 79% of members of natural history societies were over the age of 45, and societies reported that they found it difficult to attract younger members (Hindson and Carter, undated). The loss of taxonomic expertise means that we risk losing species to extinction before even knowing that they are there (Wilson 2003). Many environmental education programmes involve learning how to identify some species.

Against the backdrop of climate change, biodiversity loss and habitat destruction, there are crises developing relating to human health. In the UK, as in many developed countries, the population is becoming increasingly sedentary. It is estimated that the annual cost of inactivity in England alone is £8.2 billion. Physically active adults are reported to have a 20-30% lower chance of premature death and 50% lower chance of heart disease, stroke, cancer and diabetes than adults who are not physically active (Department of Health 2004). There is evidence that spending time outdoors can help

facilitate physical activity (Sustainable Development Commission 2008), and improve mental health (Mind 2007, Bird 2007, Barton & Pretty 2010). Some studies have shown that even just viewing nature can be beneficial, for example in patients recovering from surgery (Ulrich 1984) and reducing stress in the workplace (Kaplan 1993). This increasing body of evidence has led health practitioners to call for contact with nature to be incorporated into public health strategies (Maller et al. 2006), particularly as in recent decades there has been a trend in Western societies of a decline in contact with nature (Barratt Hacking et al. 2007). Thus, spending time with nature has the potential to deliver multiple co-benefits; improving the health of the population and developing more environmentally literate citizens. These citizens may be able to play their part in combatting climate change, restoring habitats, and documenting biodiversity through species identification and wildlife recording. One of the ways that people can spend time with nature is through environmental education.

Defining environmental education is difficult as there are myriad organisations that deliver it. An IUCN (International Union for Conservation of Nature) workshop on environmental education in schools offered the first definition of environmental education; “the process of recognising values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man [sic], his culture, and his biophysical surroundings” (IUCN 1970). Although this definition may seem fairly simple, as will be discussed later the process of measuring and changing attitudes in particular is not straightforward.

In 1977 UNEP (United Nations Environment Programme) and Unesco (United Nations Educational, Scientific and Cultural Organisation) hosted a conference about environmental education in Tbilisi, Georgia. This was attended by delegates from 68 countries including the United Kingdom, who adopted a Declaration which included the statement “Environmental education should be provided for all ages, at all levels and in both formal and non-formal education” (Unesco 1977, p 24). Despite the UK supporting this Declaration, there has been a decline in the amount of environmental education taught in schools in recent decades. When the National Curriculum was first introduced in 1989/1990, environmental education was included only as a non-statutory cross-curriculum theme, and pressures on time meant that non-core subjects like environmental education tended to get left out (Palmer 1998). In the 1995 revision of the curriculum, it was dropped as a cross-curricular theme and instead was incorporated into the core subjects of geography and science (Chatzifotiou 2006). However, many teachers feel that there is little space in the curriculum for students to engage with the natural world and appreciate the variety of living things (Gayford 2000). Recently, the UK has seen a

relaxation in the National Curriculum, and it has recently undergone a revision by the Conservative government, to be implemented in September 2014 (NAEE 2013). The importance of learning in spaces outside of the classroom was recognised with the Labour government's 2006 launch of the "Learning Outside the Classroom" manifesto (Pretty et al. 2009), with environmental education once again being seen as an important part of children's learning. During the consultation period on the revised National Curriculum, there was widespread criticism of a perceived reduction in emphasis on environmental education, particularly around climate change and sustainable development (Guardian 2013). Reflecting these criticisms, the revised National Curriculum contains references to climate change in key stage 3 (ages 11-14) (Department for Education 2013). The recently created "Free schools" and academies can opt out of the National Curriculum and it will be interesting to see if environmental education is more or less prominent in such schools in the future.

The Unesco meeting emphasised environmental education as a lifelong learning pursuit (Gough et al. 2001). However, the literature around environmental education is dominated by that which occurs in schools, despite evidence that considerable amounts of learning takes place outside school hours (Smyth 2006, Reid and Scott 2006). For example, a review of the journal Environmental Education Research over a ten year period found 67 articles about formal education, 11 about informal education and eight relating to non-formal education (Reid and Scott 2006). Formal learning has been defined as that which is organised and structured with clear learning objectives, whilst informal learning is unintentional from the learner's perspective and has no set learning objectives (Werquin 2010). Learning can take place in many settings, and informal learning tends to refer to that which takes place outside of a school setting, and is not primarily designed for school use (Hofstein and Rosenfeld 1996). Non-formal learning sits between formal and informal learning as it is usually organised, and it may have learning objectives. However, the variety of approaches within non-formal education means that there is lack of consensus about its definition (Werquin 2010). Definitions aside, it is clear that people spend a small proportion of their lifetime in formal schooling, with more time spent in "free-choice learning" environments such as national parks, gardens and museums which offer opportunities to learn about science and nature (Falk and Dierking 2000). Falk and colleagues ran telephone interviews and found that 43% of respondents reported that their knowledge came from free-choice learning in leisure time, compared to 34% who mentioned formal schooling (Falk et al. 2007).

The importance of non-formal learning is reinforced by studies which look at the "significant life experiences" of people working in the environmental sector. Palmer (1999)

conducted a questionnaire of around two thousand environmental educators who reported that direct experiences of the natural world were their most influential life experiences, with only a very small number mentioning formal education. Sward's (1999) interviews with environmental educators also found that the most frequently cited influence was outdoor experiences in natural settings. Despite the reported benefits of non-formal or free-choice learning, until recently this has often been overlooked and undervalued compared to formal science education (Falk et al. 2007).

However, there has been a shift in the last decade or so with free-choice learning environmental education receiving large amounts of funding. For example, a project called OPAL (Open Air Laboratories) received an £11.7 million grant from the Big Lottery Fund in 2007 to help "inspire the next generation of nature lovers" (OPAL, undated). OPAL has been working on an England-wide scale, designing and producing surveys of soil, air, water, Climate and Biodiversity. These have been delivered on a regional level by Community Scientists, including me, who have also been running other environmental and science education projects both with schools groups and non-school groups. These types of projects are often not reflected in the academic literature, and this research will help give voice to those involved in such projects, focusing on the benefits that people can gain from participating in such work, and how the success of environmental education projects can be assessed.

1.3 EVALUATION

Evaluation offers a way of assessing the value of activities in terms of their outcomes or impacts (Hart et al. undated). It has been defined as the collecting of information about the activities, characteristics and outcomes of programmes in order to judge the worth of the programme, improve its effectiveness and/or inform decisions about the future (Patton 2002). There are many other definitions of evaluation, but they all tend to agree that the primary purpose of evaluation is to improve and inform practice (Clarke 1999). Monitoring is allied to evaluation and involves collecting numerical data, for example, about the numbers, ages and genders of people taking part in activities (RCUK 2005). Much of this monitoring data can be collected as part of daily administration (Easton 1997).

Research about environmental education can also help inform why certain types of programme are successful, and although often closely related to evaluation, research differs in that it does not tend to make value judgements, but instead uses empirical data (Shadish et al. 1991). Research aims to discover new knowledge (Clarke 1999) which can be generalised to a greater or lesser extent. The goal of evaluation, on the other hand, is

to generate context-specific knowledge, which will have a more limited application (Alkin and Taut 2002).

There are two main types of evaluation, formative and summative. These terms were first used by Scriven (1967, 1972 in Shadish et al. 1991), with formative evaluation that which is carried out during the lifetime of the project in order to provide information about how to improve it, whilst summative evaluation is conducted at the end of the project to help assess whether the project has been successful or not (National STEM Centre 2009). Formative evaluation asks questions like 'why' and 'how' a programme works as well as 'what happened' during the project (Easton 1997), and seeks to improve the programme whilst it is being run (Patton 2002).

There is a large body of literature around the theoretical and philosophical underpinnings of evaluation and different evaluation methods. The United States has been particularly active in the evaluation research area, with a long history of undertaking evaluations, particularly of large programmes designed to solve social problems (Shadish et al. 1991, House 2005). These evaluations focused on seeing if such projects were achieving their goals (Patton 2002), and aimed to find out which programmes worked best in order to provide advice for future reform and funding (House 2005). They were driven by the need for accountability, in order to demonstrate responsible use of resources (Patton 2002). These early evaluations were mainly been carried out by professional evaluators, using a variety of different models (Shadish et al. 1991). The theories used to generate evaluation models are underpinned by different philosophies, which may seem irrelevant to the actual practice of evaluation but they are considered by many to be important in helping choose methodologies for both the running of projects and their evaluations (e.g. Fitz-Gibbon and Morris 1987, Shadish et al. 1991), and therefore they will be briefly described here. The philosophies relevant to evaluation and research can be considered as being on a continuum between positivism and interpretivism. In broad terms, positivists generate hypotheses and then test them through objective methods to uncover knowledge about an external reality. This contrasts with interpretivism, where researchers recognise that the social domain is fundamentally different from natural sciences and therefore requires different methods for research (Bryman 2008).

Shadish et al. 1991 offer a useful summary of the history of evaluation research, with theorists categorised into three stages. The early (Stage 1) researchers came from a positivist standpoint and their methodologies emphasised uncovering valid causal knowledge through quantitative experimental approaches involving randomised trials and control groups. The Stage 2 theorists built on this work and highlighted the fact that the

results of evaluations were rarely used by practitioners. To counter this, they recommended that the needs of the end-users ('stakeholders') were taken into account when designing evaluation methodologies. An example of these types of theorists is Fitz-Gibbon and Morris (1987), who state that all program evaluations should incorporate a control group, but recognise that often this does not occur, sometimes due to evaluators being brought in too late, or because there are ethical difficulties with depriving groups of a 'treatment' or programme. Thus these Stage 2 theorists used a greater methodological diversity, including more qualitative research methods. The Stage 3 theorists synthesised work from the two previous stages, championing methodological pluralism, and reflecting the values of stakeholders in the evaluation process whilst also seeing the evaluator as an independent source of values (Shadish et al. 1991). The latest theorists tend to see qualitative and quantitative methodologies as being complementary as they can provide different insights during evaluation (Easton 1997), and many recommend a mixed-methods approach with at least two independent measures of key variables (Bamberger et al. 2004). Qualitative evaluations tend to recognise the complexities of reality, and are particularly appropriate for projects where there is no need to generalise the findings (House 2005). Fetterman (1988) viewed qualitative approaches as a useful addition to the other approaches used by education evaluators. Patton (2002) tries to move beyond the qualitative-quantitative debate and believes that the ideal evaluation design is one that is methodologically appropriate to the situation.

An early model used in evaluation was the systems or logic model, see Figure 1. This looked at the context, inputs (resources), process (methods), outputs and outcomes of programmes, with the evaluators' role being to quantify these different elements (Easton 1997). Outputs are defined as immediate results, such as numbers attending. Outcomes are the changes that occur as a result of the programme, whilst impact can be defined as the vision, the hoped for change that takes place over a longer term (Patton 2002, Thompson and Hoffman 2003). Outcome-based approaches are a popular form of evaluation in this era of increased accountability, frequently used by education, health and social care practitioners to demonstrate the effectiveness of their programmes (Schalock 2001). In the UK, many funders encourage their recipients to use an outcome-based approach to evaluation, due to the popularity of this approach within government departments (Ellis and Gregory 2008).

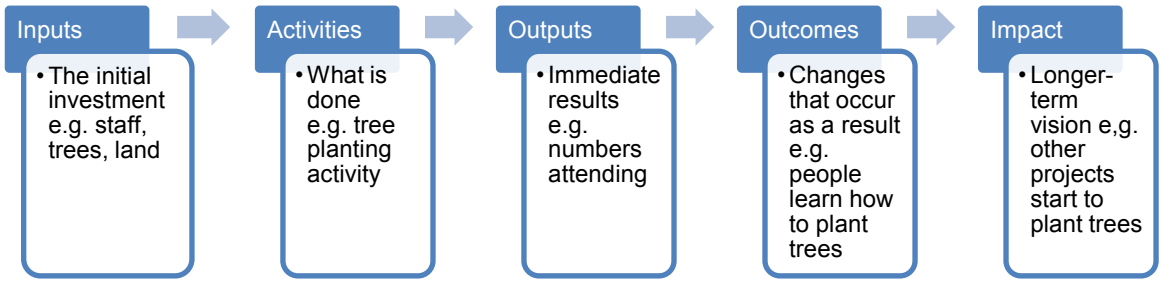

Figure 1 The logic model of evaluation, showing the different stages of an imaginary tree planting programme. The programme's success can be measured through one or more of the Outputs, Outcomes and Impact components.

However, there are a number of problems with this approach, including that project goals and therefore outcomes often change over the life of the project. Another criticism is that measuring the intended outputs and outcomes of the project can risk blinding evaluators to the actual effect of the project. To counter this, Scriven (1973) suggested goal-free evaluation where evaluators do not look at the goals used by project staff, and instead evaluate whatever outcomes they find (Shadish et al. 1991).

With qualitative evaluation methodologies largely being accepted within the evaluation research community, the range of methodologies that can be used in evaluation is now bigger than ever. Of course, different methods are suitable in different situations, and they vary in degrees of complexity, the types of questions they can answer, how long it takes to conduct the evaluation, and so on. The Kirkpatrick evaluation model, commonly used in business and industry training settings, is useful here as it categorises evaluation into one of 4 levels; Reaction, Learning, Behaviour and Results evaluation, with each level giving increasingly detailed data about the impact of programmes on participants that is more time consuming to collect (see Figure 2). Reaction evaluation looks at participants' initial responses to participation, Learning evaluation looks at changes in understanding or awareness, Behaviour evaluation considers whether people modify what they do after participation, and Results evaluation tracks long-term impacts on measurable outcomes (Kirkpatrick 1996, RCUK 2005). In this thesis, I use the Kirkpatrick typology to categorise types of evaluation conducted by environmental educators. To my knowledge, this typology has not been used in an environmental education context before.

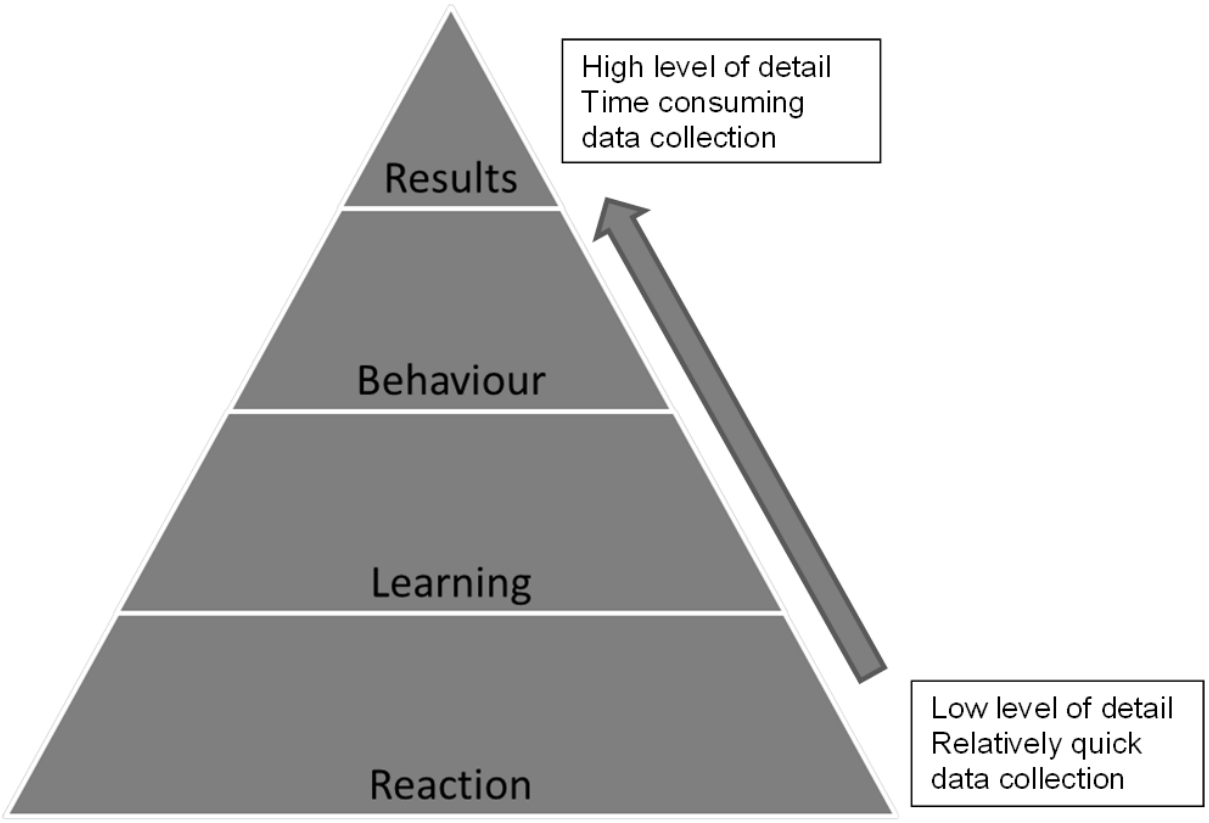

Figure 2 The Kirkpatrick model of evaluation, showing the four different levels of evaluation. Reaction evaluation is the simplest and least time consuming, whilst Results evaluation can provide detailed insight into the programme but is time consuming to conduct.

Alongside the trends towards using a wider range of methodologies, and taking greater account of the needs of end-users, over the last 20 years or so there has been a shift towards decentralisation of evaluation, from external evaluators coming in to assess projects, to staff members evaluating their own projects (Easton 1997). Coupled with this has been a move away from solely summative evaluations towards formative evaluations being used to improve programme effectiveness (Patton 2002).

Despite the large body of research surrounding evaluation methodologies, it has been acknowledged by evaluators and academics that the basic principles of evaluation design are often ignored (Bamberger et al. 2004). In the education field, evaluations are often criticised for only focusing on easy to measure indicators e.g. the input and process aspects of programmes, rather than the actual outputs and outcomes, as these are easier to measure (Easton 1997). Other problems with evaluation more generally is that often it is not considered until near the end of the project (Hernández 2000), and it tends to suffer from limited funding (Bamberger et al. 2004).

Although evaluation is becoming an increasingly common part of everyday life in this era of accountability (Ellis and Gregory 2008, Spencer and Couture 2009), very little research

has been conducted into practices of evaluation, including who is evaluating, why they are evaluating, and the methods they use (Henry and Mark 2003). Henry and Mark (2003) and Smith (1993) have called for more research around evaluation practice in order to improve that practice, specifically focusing on the methods and approaches used in evaluation. This is needed because researchers have identified a gap between how evaluation theorists say evaluations should be conducted, and the practice that occurs in reality (Christie 2003). Evaluation methods are continually evolving. This is necessary because it can help to ensure that the evaluation meets the needs of practitioners and therefore the results are used. However, little research has been conducted into what evaluation actually takes place compared to the theories and models of evaluation (Smith 1993). Practitioners may have their own evaluation theories, which may be implicit or explicit, which they use when designing evaluations (Shadish et al. 1999, Tourmen 2009). Leviton (2003) argues that mental models used by those conducting evaluations need to be constructed, in order to understand practice. This is important because in an era of increased accountability, evaluations are increasingly being used to determine which programmes receive future funding, and we need to understand the theory that underpins the evaluations. Such studies also help to inform the development of new evaluation theories which are more closely linked to real-world practice. Little research has been conducted into evaluators' practice (Kundin 2010), and even less into the practice of practitioners who are not professional evaluators (Shaw and Faulkner 2006).

1.4 Environmental Education Evaluation

Anyone who has taken groups out to do fieldwork will know how much students can enjoy the experience, but a number of authors are increasingly asking if these experiences actually impact their learning (e.g. Carlson 2008), which is of course one of the key aims of environmental education. A review of literature on formal environmental education found "a strong case for questioning the notion that nature experience automatically contributes to environmental awareness, commitment and action" (Rickinson et al. 2004, 6), and that "there is still much to be learnt about how and why programmes work or not" (Rickinson et al. 2004, p. 8). A more recent review of three environmental education journals found just 20 articles on programme evaluation over a 15 year period, and the authors concluded from this, and their experiences of working with environmental educators, that the majority of programmes do not include systematic evaluation into the planning of their projects (Carleton-Hug and Hug 2010). However, educators are under increasing pressure from their funders and audiences to demonstrate their results through evaluation (Thompson and Hoffman 2003, Spencer and Couture 2009).

There appears to be an assumption by practitioners and researchers that spending time with nature is always a positive experience. In a review of literature on Adventure Education, for example, the authors “were struck by the number of research papers that read more like program advertisements” (Hattie et al. 1997, p. 45). The few papers that included evaluation of projects seemed to ignore negative evidence and only highlight the positive findings (Hattie et al. 1997). Similarly, in the social work literature there are reports of projects using nature as a place to treat at-risk children, despite a lack of evidence that this is beneficial, and a focus on only the positive effects on participants (Ungar et al. 2005, Bandoroff and Scherer 1994). Research within conservation education has also shown that there is little ongoing assessment or evaluation built into programmes and consequently few published reports about evaluation (Jacobson and McDuff 1997). In an allied field, a review of 37 audits conducted on conservation projects found that less than a third had any formal systems for monitoring or evaluating programmes and feeding this back into practice. In general, these projects did not keep notes about what worked and what didn’t work (O’Neill 2007). It has also been reported that zoos and aquaria, another space in which environmental education can occur, often do not evaluate their projects (Khalil and Ardoin 2011). According to the education literature, whilst evaluation is routine in the formal (largely school-based) sector, it is less well integrated in the non-formal education spheres (Norland 2005), within which many environmental education projects operate.

Several explanations for the limited amount of evaluation reported within the non-formal environmental education sector have been proposed, many of which are relevant to evaluation more widely. These include lack of time, funds and expertise (Stokking et al. 1999), and overreliance on volunteers (Ward-Thompson et al. 2006), particularly now that many budgets have been cut in the UK since the financial crisis. There may be institutional resistance to evaluation, particularly if it has not occurred before (Carleton-Hug and Hug 2010). Evaluation can be a costly process, and the recommendations and suggestions that emerge from the process may be unwelcome or difficult to implement (Kleiman et al. 2000). Particularly problematic for non-formal learning evaluation is that there are usually no formal curricula against which to assess success (Ballantyne et al. 2005). Rickinson and colleagues’ review concluded that “The difficulty of identifying, measuring and evaluating the benefits of fieldwork and field trips should not be underestimated by researchers, practitioners or policy makers” (Rickinson et al. 2004, p. 24). These problems and difficulties may also have led to a lack of tools available to practitioners to evaluate their projects, with many projects focusing simply on trying to detect an increase in knowledge after the project (Fein et al. 2001).

The most frequently used mechanism for detecting changes documented in the literature is pre- and post- project questionnaires (Carleton-Hug and Hug 2010). An often-cited example of a study using this methodology is about a project in which a new programme based on swift ecology was introduced into the school curriculum. The questionnaire included items about the ecology of swifts, how much participants enjoyed the programme, and questions about general environmental perceptions. It was given one week before the programme and again one month after it finished. The students showed an increase in transferred and retained knowledge of swifts (Bogner 1999). A similar research design assessed inter-generational knowledge transfer during a programme teaching school children about macaws (Vaughan et al. 2003). Both these studies attempted to assess longer-term impacts (results evaluation) although on short timescales of less than 3 months. Other studies show similar knowledge increases (e.g. Kuhar et al. 2007, Ajiboye and Silo 2008, Duerden and Witt 2010), and a review of environmental education articles by Rickinson (2001) found that the majority focused on increasing knowledge and understanding of environmental issues. Measuring knowledge increase after projects may be popular because many environmental educators assume that increased knowledge leads to improved attitudes towards the environment and pro-environmental behaviour (Hungerford and Volk 1990, Kolmuss and Agyeman 2002). There is an increasing body of research to suggest that this model of behaviour change is overly simplistic, with some researchers stating “It is both logical and obvious that if an education programme does not deliberately set out to change attitudes and behaviour it is extremely unlikely to do so” (Orams 1997, 297). The rationale behind this statement will be considered next.

An attitude can be viewed as “a learned predisposition to respond in a consistently favourable or unfavourable manner with respect to a given object” (Fishbein and Ajzen 1975, 6), i.e. attitudes are fixed. If we accept this view, then it is possible to measure a person’s attitudes towards something. A common way of assessing attitude is by asking people to rate an object on a bipolar scale from good to bad (Fishbein and Ajzen 1975). This scale is often known as a Likert scale. Another way of measuring attitudes is through a technique called semantic differential, where participants are given a list of paired adjectives from which they have to choose the one they feel most applies to a concept or issue. If this is repeated for other concepts, a picture of the participants attitudes towards a variety of issues can be built up (Eiser 1994). An alternative view is that attitudes are not fixed or stable. Most theories of attitude do not emphasise the time dependence or situationality of attitudes (Eiser 1994), despite focus groups around environmental issues showing that attitudes shift in the course of dialogue with others (Burningham and Thrush 2001). A study by Macnaghten (1995) found that people’s expressed opinions differed

depending on how the researcher framed the issue, with the researcher using one of three different “voices” in telephone interviews with 3000 people (Macnaghten 1995). It may be that verbal expressions of attitude are actually what people have learnt to say in certain situations (Eiser 1994).

An additional problem with measuring attitude is that the relationship between attitude and behaviour is complex. Early models about intentions and actions, such as the Theory of Reasoned Action, developed by Ajzen and Fishbein in 1980, state that attitudes influence behavioural intentions and that these shape people’s actions. However, this model assumes that humans are rational, systematically use the information available to them and that values are fixed (Kollmuss and Agyeman 2002). More recent research has found that the factors affecting pro-environmental behaviours are more complex than some of the early models suggest. Hungerford and Volk’s 1990 Environmental Behaviour Model has three types of variables that can influence behaviour; entry level variables (of which the most important is environmental sensitivity or empathy towards the environment); ownership variables (those that make the issues more personal, including in-depth knowledge about, and personal investment in, environmental issues) and last, but certainly not least; empowerment variables, which include things such as intention to act, and locus of control (how much impact someone believes their actions can have). Empowering participants so that they feel they can make a difference is critical for pro-environmental behaviour but is often neglected in environmental education projects (Hungerford and Volk 1990).

Despite the problems inherent in assessing people’s attitudes and behaviours and using them to evaluate project success, many studies have attempted to do this. Until recently, most research into people’s attitudes towards nature and the environment has used quantitative methods (Wilhelm and Schneider 2005), mainly questionnaires. However, these tend not to ask why certain attitudes are held or why some issues are more important to people than others, which may be more informative than simply measuring attitudes (Rickinson 2001). Qualitative and mixed-methods (using quantitative and qualitative techniques to measure different aspects of a phenomenon (Greene et al. 1989)) approaches to evaluation are less common in the literature, but do exist, for example, in assessing visitors perceptions of biodiversity before and after visiting a World Wildlife Fund exhibition. Here, participants were asked to complete either “Personal Meaning Maps” (a piece of paper saying “Biodiversity” on which they had to write down thoughts, words, ideas or images that came to mind), or a card sorting activity (where they ranked activities according to their effectiveness in protecting biodiversity) both before and after their visit. The study concluded that changing knowledge, attitudes and behaviour

through brief educational intervention is hard to achieve and measure (Storksdieck et al. 2005). In another mixed-methods study, students attending an Outdoor Education Camp in New Zealand were given pre- and post- test questionnaires and an environmental attitude test. Researchers also carried out participant observation and interviews to gain a more in-depth understanding of behaviour, thoughts and feelings. The environmental attitude test found a significant increase in positive environmental attitudes, but the researchers recommended a longitudinal study of 3 months to 1 year to assess the influence of improved attitudes and intention on the actual behaviour of students (Taff et al. 2007). These are examples of Behaviour and Results evaluation in the Kirkpatrick typology. Longitudinal studies are important because some studies have shown that the impacts of programmes may be short-lived, with knowledge and attitudes dropping back to previous levels over time, particularly if learning is not reinforced (Storksdieck et al. 2005).

An alternative way of assessing the long-term effects of environmental education is to ask people about their past experiences. Significant Life Experience (SLE) research was originally developed to find out what inspired environmental activists (Tanner 1998) in order to understand how to improve environmental education. Since then, other researchers have used similar approaches with environmental educators, who highlighted direct experiences of the natural world as being most important (Palmer 1999, Corcoran 1999), with negative experiences such as the destruction of local green spaces also important for inspiring action (Chawla 1998). One of the critiques of using SLE and similar research is the lack of control groups for comparison (Bixler et al. 2002), and the fact that "simply recalling a visit does not mean that it was an effective learning experience or that the time could not be more usefully spent in the classroom" (Rickinson et al. 2004, 21). Some research has also shown that people recall events through a lens of their sociocultural identity, so that their memories are not discrete recollections but are constructions of multiple other events, some of which they may not even have experienced first-hand (Anderson 2003).

Another problem with assessing the effectiveness of environmental education programmes through longitudinal studies is that they are often impractical for environmental educators to conduct. For example, participant contact details may not have been kept, there may not be the resources to follow up activities, people may have changed addresses, or they may not remember the project in sufficient detail. Results from the project can come too late for practitioners to be able to use them to inform their practice and implement changes. Additionally, many environmental educators deliver low-budget projects with an even smaller (or non-existent) budget for evaluation (Norland

2005). As such, the literature around evaluation research remains dominated by questionnaire-based studies in the realms of Reactive and Learning evaluation.

McDuff (2002) reports that the majority of evaluations of environmental education projects are carried out by external consultants or academics (for an example, see Fien et al. 2001), rather than practitioners themselves, and advocates a more participatory approach to evaluation, where practitioners identify the problems, design the evaluation, and collect, analyse and use the data. An issue with external evaluations is that the results tend to be underutilised (Shadish et al. 1991), and a more participatory approach may encourage use of findings. Patton (2002) has suggested that the quality of evaluations should be judged by whether the intended users actually utilise the findings. Easton (1997) describes a decentralisation trend occurring in environmental education evaluation, from external agencies of the kind McDuff (2002) reports towards internal evaluation. This decentralisation shift places the emphasis on project staff to evaluate their work, which can be advantageous as they know the project and its objectives well (RCUK 2005). It also helps to increase the chances of the results of evaluation actually being used (Easton 1997). However, this can be problematic as project evaluation requires specific skills and methodologies that practitioners do not necessarily possess, and therefore training is needed. In some cases, professional evaluators have taken on a role as facilitators, with some providing training for project staff, and helping them design their evaluation methodologies (Easton 1997). A report by the National STEM Centre (2009) stated that many organisations delivering education programmes would find best practice guidelines for evaluation useful.

An alternative explanation for the lack of evaluation reported in the literature is that, although it may be taking place, it is not documented within the academic literature (Monroe 2010). This may be particularly true for non-formal environmental education projects, which are generally understudied compared to formal projects (Reid and Scott 2006). McDuff (2002) used a variety of methods to reveal the evaluation practices of one organisation, including interviewing staff, participant observation and content analysis of documents, and called for more research into attitudes towards evaluation, and identification of the barriers and opportunities for it to take place.

1.5 AIMS AND OBJECTIVES

In summary, environmental educators are working in an era of increased accountability, where funders are keen to know what impact their money has had on project participants. It is therefore surprising that very little research has been conducted into the evaluation

practice of practitioners. The limited literature on the topic suggests a general trend towards internalisation of evaluation, i.e. practitioners evaluating projects themselves, but it is not known what methods they use, or how often they evaluate. Very little research has even been conducted into what practitioners believe are the outcomes of environmental education, which is important as understanding project outcomes is often the first step in evaluation (Berk and Rossi 1990). Given the importance placed on evaluation, it is also surprising that more research has not been conducted into the barriers practitioners face in conducting it.

Moreover, the environmental education literature is dominated by studies about formal education; that which takes place in schools and other formal learning contexts. Therefore my research incorporated practitioners who work primarily in the non-formal learning sector, as well as those who work with schools, and a large number who work with a variety of groups drawn from both formal and non-formal sectors.

The main aim of this thesis was to explore the state of evaluation within environmental education in the UK, thereby contributing to the very limited literature in this field. I worked with environmental educators in order to understand the outcomes they feel their work can achieve, and the tools they use to evaluate whether or not these outcomes are achieved. I also asked practitioners and their participants about any barriers to evaluation of environmental education. My key research questions were:

- What do practitioners and participants see as the outcomes of environmental education?

- What are the range of methods used for evaluation within environmental education?

- What are the barriers to evaluation of environmental education?

In addition to these research questions, I also aimed to create a toolkit of evaluation methods to be used by environmental educators. This toolkit was designed to contain methods that had been tried, tested and improved by practitioners through an iterative process. I also wanted to provide practitioners with a forum in which they could discuss the outcomes of their work and share best practice about environmental education and its evaluation.

1.6 METHODOLOGICAL APPROACH

To answer my key questions I embarked on a participatory action research approach. Participatory action research can be defined as a collaborative process of research, education and action, involving multiple cycles of action and reflection (Kindon et al. 2007). It involves research, action and participation (Greenwood and Levin 1998). It is termed participatory because the researcher does not position themselves as an expert outsider setting the agenda, deciding the questions and then implementing the project, simply viewing the 'researched' as objects for research. Instead, they are seen as co-researchers (McFarlane and Hansen 2007). The advantage of this approach is that an understanding of another person's perspective is often best achieved by being involved in activities with them (Patton 2002). Participatory research is based on the premise that stakeholders (in this case, practitioners and participants in environmental education) know best about issues that involve them, and are therefore well-placed to offer potential solutions to problems (Grieser 2000). Education researchers (e.g. Reid and Scott 2006) have called for closer links between researchers and practitioners and this participatory approach may help contribute to this goal. The action part of the approach indicates that it is research which seeks to promote change, and as it is participatory, that change should be controlled by practitioners and empower them to continue making changes in the future (Greenwood and Levin 1998). In addition to the three main research questions addressed in this thesis, I wanted to create a toolkit of evaluation methods that could be used by practitioners, which would have been tried, tested and improved by them in an iterative process, in order to improve evaluation practice. Therefore, a participatory action research approach was appropriate.

I tried to ensure that practitioners saw me as a co-participant rather than an 'expert', for example by talking to environmental educators (participants and non-participants) to gain their views on how the research process would work best. I sent drafts of chapters to practitioners, which gave them all an opportunity to comment on my findings. Such participatory approaches also tend to emphasise sharing best practice and knowledge (Kindon et al. 2007), and are therefore well suited to my aims of creating a toolkit of evaluation methods used by practitioners and providing a forum for discussion of the issues around evaluation.

Mixed-methods research is a way of uncovering different aspects of a phenomenon through a combination of qualitative and quantitative methods (Greene et al. 1989). Qualitative and quantitative methodologies are often viewed as dichotomous, but I share Silverman's view that such "dichotomies or polarities in social science [are] highly

dangerous….At worse they are excuses for not thinking, which assemble groups of sociologists into 'armed camps', unwilling to learn from each other" (Silverman 2006, p. 58). The advantage of using multiple research methods is that it allows a research question to be explored from different perspectives. The data gathered through these methods can then be compared and contrasted. This is known as triangulation (Guba 1981). Qualitative methods, such as focus groups, can be particularly useful for extending and deepening understandings that arise from quantitative research involving questionnaires. This approach is commonly used in action research, in which methods often need to be more informal, flexible and problem-specific than in other forms of research (Patton 2002).

According to Silverman (2006), there are three main ways of combining qualitative and quantitative research. One is to use qualitative research to explore a topic before conducting a quantitative study. Another is to conduct a quantitative study, such as a survey, to establish a broad understanding of the field, followed by qualitative research to explore the key issues in greater depth. The third is to conduct a qualitative study but use quantitative data to locate the results in a broader context. As will be discussed shortly, I used the second approach: first conducting a questionnaire to explore the field of environmental education evaluation, and then qualitative focus groups and diaries with practitioners. The information gained from the questionnaires was used as a discussion stimulus during the focus groups, and allowed me to gain more detailed insights into the field than would have been possible through questionnaires alone.

There were four main methods used in this project: self-completion questionnaires, focus groups, solicited diaries and participant observation. The aim was for each of these methods to deepen the understanding gained from the others. These four methods and the rationale for using each of them will be considered next. Details of how the methods were applied to answer the key research questions are provided in the methods sections of appropriate chapters.

Questionnaires can be used to gain both qualitative and quantitative data from respondents, depending on the format of the questions, which can be open or closed (Newell 1993). Open questions allow the respondents to express themselves in their own words. A disadvantage of open questions is that they are time consuming to analyse as the answers cannot be pre-coded. They can also be more time consuming to complete. However, open questions can be particularly useful when starting research projects as they do not constrain respondents (Newell 1993), unlike closed questions where respondents have to choose from pre-determined answers. My questionnaires for

practitioners and participants were designed to be self-completed, i.e. to be completed in written form by respondents. I followed the good practice of beginning the questionnaires with 'warm up' closed questions that are quick and easy to complete, with more detailed open questions later on (Agyeman 1998). The practitioner questionnaire was designed to be completed online or at a computer, an advantage of this approach over paper questionnaires is that there is no need to transcribe the responses. As participants were recruited at environmental education sessions, they did not have access to a computer and therefore their questionnaire was a paper copy. Practitioner questionnaire respondents were selected using a combination of a convenience and snowball sampling strategy, see Section 2.2.1 for details. Snowball sampling is a form of chain referral (Bernard and Ryan 2010); a small number of known respondents are asked to nominate others to take part and so on (Rose 1982). This can be particularly useful if groups are hard to study, for example, if they are busy or unlikely to be interested in the research (Bernard and Ryan 2010). I used this approach as my own experiences suggested that environmental educators are often time-poor. This form of sampling is also useful when it is not possible to complete a sampling frame, which is a list of all the members in a population. Creating a sampling frame is often costly, time-consuming and impractical (Rose 1982), for example, creating a list of all environmental educators in the UK or even Yorkshire, would be an extremely difficult task. This is because of the diversity of organisations and individuals which conduct environmental education in both the formal and non-formal education contexts. Instead of creating a sampling frame and taking a representative from this sample, Rose (1982) recommends trying to define the 'working universe': the people who could have been sampled in the population, and then using snowball sampling to select a sample typical of this working universe.

One of the key strengths of qualitative research is that it allows 'how' and 'why' questions to be explored (Silverman 2006). Qualitative methods such as focus groups may be better than questionnaires for understanding people's values (Burgess et al. 1988) as they allow people to speak in their own words (Connell et al. 1999) and can provide rich, detailed data. Discussion in groups also allows people to challenge each others statements, and can help reveal shifts in attitude in the course of dialogue with others (Puchta and Potter 2004). Focus groups, group discussions where a stimulus for discussion is provided, are useful where the interaction of group members is expected to produce data and insights that would be less accessible if not conducted in a group (Flick 2006). I used focus groups to gain insight into practitioners' conceptions of environmental education and their views on any evaluation they conduct of their work. I used a purposive sampling strategy for selecting practitioners, which is where there are predetermined criteria for inclusion (Bernard and Ryan 2010) and respondents are selected to illustrate particular aspects of

the process of interest (Silverman 2006). I wanted to include practitioners from a range of different types of organisations, from different parts of Yorkshire and working in both urban and rural settings. Section 2.2.2 gives details of the sampling method and profile of participating practitioners. Focus groups are less time consuming for researchers to conduct than individual interviews as they allow viewpoints from multiple respondents to be captured at once (Fielding 1993a), although there can be disadvantages, for example, if one or two people dominate discussions at the expense of others. In a focus group, the moderator can take one of three roles (Flick 2006), which involve increasing interaction with the participants. As a minimum, they can formally direct the process by controlling the agenda and setting the discussion off at the beginning and closing it at the end. Topical steering is where the moderator controls the agenda, fixes the beginning and end of discussions but also introduces new questions and steers the discussion topics. Lastly, the moderator can steer the dynamics, where they do all of the above roles but in addition draw reserved members into the group discussion and ask provocative questions in order to keep the discussion going (Flick 2006). I chose this latter role as I wanted to ensure that all members of the group were able to discuss the topics and steered conversation to prevent domination by one or two individuals. I also wanted to maximise the amount of time spent discussing the issues I was interested in. I saw myself as an active participant (Silverman 2006) in the focus groups, encouraging practitioners to interact with each other and expand on certain points.

The focus groups were conducted after the practitioner questionnaire. I asked all practitioners participating in the focus groups to complete the questionnaire before attending, but only sixteen of them did. The intention was to gain detailed information about the types of groups practitioners worked with and range of methods they used for evaluating, which could then be explored in more detail in the focus groups. As a discussion stimulus I provided focus group participants with a list generated from questionnaire responses. This discussion also served as an opportunity for practitioners to comment on this aspect of the questionnaire responses. As the focus groups were designed to provide baseline information about how practitioners are currently evaluating their projects, I asked practitioners to bring with them examples of their evaluation tools. These served as a second stimulus for discussion. The focus groups each lasted two hours and I steered discussion using a topic guide, details of which are given in Section 2.2.2. I facilitated the group in order to ensure that no individual practitioner dominated discussion, and designed the focus groups to incorporate paired discussion to allow the views to be heard of practitioners who may have felt uncomfortable speaking in a larger group. The focus groups also provided a space for practitioners to meet and share knowledge, which is an important aspect of the participatory action research approach.

Practitioners were also asked to keep a diary, or reflection document, each time they used a new evaluation method. Many different types of diaries exist but they all share four key features. Entries are made by identifiable individuals; they are contemporaneous, i.e. written close in time to events; they provide a record of what a person considers relevant or important; and they tend to be organised around regular or dated entries (Alaszewski 2006). In my research, practitioners were asked to make a diary entry or contribute to an online collaboration space after they'd used an evaluation tool, in order for them to provide feedback about their experiences. Solicited diaries like these differ from personal diaries as they have been requested as part of a research project and are therefore may partly reflect what the participant feels the researcher wants to read. A combination of focus groups followed by diaries has been shown to offer a longitudinal insight that would not be possible through focus groups alone (Meth 2003). The temporal nature of diary writing can also allow a "break in logic between entries" (Meth 2003, p 198), reducing the opportunity for certain themes to dominate, as can occur in focus groups. The use of diaries can also allow researchers to explore tacit knowledge, i.e. that which is grounded in personal assumptions about the world and hard to articulate to others (Alaszewski 2006). My aim of using the reflections form was to document some of the practicalities of the evaluation method, for example, how long it took to do the evaluation and whether it was easy to do. It also gave space for practitioners to write how they felt the evaluation method could be improved. Another key rationale for using the reflective diaries was that they would be discussed in later focus groups, as an *aide memoir* for practitioners. Details of the structure of the diaries, the practitioners who engaged with them and methods of analysis are given in Sections 3.2. and 3.3.

The final method of data collection was participant observation, which involves the researcher being part of a group to gain detailed data about the issue being researched. Participant observation is a key aspect of ethnographic approaches, where observation and participation are interwoven with other procedures. Ethnography aims to describe social realities and how they are constructed by individuals and groups (Flick 2006). Ethnographic methods are used in many different disciplines, and Atkinson and Hammersley (1998) note that definitions of ethnography and its methods such as participant observation are controversial. They offer some key features of ethnographic research; it tends to emphasise exploring phenomena rather than testing hypotheses, work with small numbers of cases in detail, and the analysis involves interpretation of meanings in an inductive way (Atkinson and Hammersley 1998). Methods of analysis will be considered further in the following section. I wanted to gain an understanding of participant's perspectives of environmental education, and therefore an ethnographic

approach involving participant observation was appropriate. Gold (1958) identified four possible roles for researchers wanting to observe participants. These are on a spectrum from complete participant, through participant-as-observer and observer-as-participant to complete observer. With the researcher as complete participant, the true identity of the researcher is not revealed to the person(s) being observed. This is also known as covert observation, and raises serious ethical concerns with researchers (Fielding 1993b). At the other end of the scale is the complete observer, where similarly the observed does not know they are being watched, and this approach also means the researcher cannot ask questions or engage with the participants. The more observational, rather than participatory, the researcher is, the higher the chance of enthnocentrism (Gold 1958), where actions etc. can be misconstrued because the researcher is viewing them through their own socio-cultural lens. I conducted overt observation of a group of environmental education participants (see Section 2.2.4 for details), where I took the role of observer-as-participant. This is commonly used in situations where the researcher only sees the participants once (Gold 1958), as was the case in my research. Here the participants are aware of the presence of the researcher, and this allows them to ask questions to gain more details about the processes they are observing. As part of this process I engaged in situational conversations with participants, where the researcher asks direct questions at opportune moments (Rose 1982), about their motivations for getting involved in environmental education, and the benefits they felt they gained from taking part. After conversations had finished, I spent time recording what had been said in my notebook, which is an effective way of documenting discussions without being distracting for participants or making them feel self-conscious, which can occur if notes are being taken during the conversation (Fielding 1993b). A disadvantage of any observation is that the observer can never grasp and note down all aspects of a situation (Flick 2006), but taking notes contemporaneous with the event maximises the amount of information that can be recalled.

This combination of qualitative and quantitative methods was chosen to allow me to gain an understanding of the ways in which practitioners themselves evaluate their projects, contrasting with previous research in this field that has mainly reviewed academic journals to infer evaluation practice from publications (c.f. Rickinson et al. 2004, Carleton-Hug and Hug 2010) and a single study into the evaluation practice of one organisation (McDuff 2002). The methods chosen also allowed me to gain an insight into participants feelings towards evaluation, and the benefits they feel they gain from participating in environmental education projects. To analyse my data I used a mainly inductive analytical approach, and this will be described next.

1.7 ANALYTICAL APPROACH

Quantitative and qualitative research methods generate different types of data, which need to be analysed in different ways. Despite different analytical approaches, the quality of the data analysis is equally important in quantitative and qualitative research. When judging the quality of quantitative research, three main criteria are used: reliability, validity and objectivity (Flick 2006). Bryman (2008) frames these as trustworthiness and generalisability: how representative the data are of the situation more widely. Some researchers (e.g. Flick 2006) believe these criteria can be applied or reformulated for qualitative research, whilst others think that the assessment of quality should be quite different (e.g. Spencer 2003, Guba 1981). In a reformulation of the criteria for evaluating quantitative research to qualitative research, reliability can be thought of as ensuring that all the correct procedures and conventions are followed, for example, data are supported by good documentation (Flick 2006). Validity is considered to be whether the researchers see what they think they see, and objectivity involves more than one researcher examining the same data and comparing their findings (Flick 2006). Attempts have been made to construct criteria specifically for qualitative research, for example, Guba and Lincoln (1989) suggest five alternative measures of quality: trustworthiness, credibility, dependability, transferability and confirmability. These alternative criteria are important because unlike quantitative research where a key aspect for judging quality is how representative the data are of a wider situation, qualitative research working with small numbers of cases does not generally aim to be able to transfer understandings gained to the wider population. Instead, it is more appropriate to consider how the findings from the cases being studied compare to the literature, looking for both typical and atypical cases (Mitchell 1983). They offer a number of strategies for ensuring that these criteria are met, some of which are related to methods of data collection, and others which are important during the phase of data analysis. During data collection, prolonged engagement with the objects of study is important, as is persistent observation: spending enough time observing the situation to identify the most relevant issues. During the research, discussion with a “disinterested peer” (Guba and Lincoln 1989, p. 237) as a peer debriefing is important for exploring hypotheses and potential biases and blind spots. My supervisor, colleagues and friends acted as disinterested peers for this research. Whilst analysing the data, it is important to conduct negative case analysis, which involves revising theories or hypotheses in the light of new findings, paying particular attention to data which contradicts that of previous findings. Tabulations of the frequency with which themes arose in the data can help highlight negative cases (Silverman 2006). To improve credibility of data, member checks can be conducted, which is where the people being studied review findings, check accuracy of interpretations etc. in order to ensure that any misunderstanding by the researcher is minimised (Guba and Lincoln 1989). Showing

results to participants in this way helps to democratise the research process, as in the past, some ethnographic studies have been critiqued for being rather hierarchical and undemocratic (Atkinson and Hammersley 1998). For these reasons, I sent copies of my results chapters to my practitioners for comment. Three practitioners responded with detailed feedback which was analysed along with the rest of the data, as recommended by Silverman (2006).

There are two main approaches to analysing data: inductive and deductive, although analysis almost always involves a combination of the two. In an inductive approach to analysis, themes in the data come from the data itself, whereas in a deductive approach the themes are generated from a prior understanding of the phenomena (Bernard and Ryan 2010). These different approaches can be seen as a continuum. Grounded theory is a method of analysis found at the inductive end of the spectrum. This is a process which involves developing theory through a series of specific steps of analysis, beginning with line-by-line coding of text to generate a working hypothesis or model. Grounded theory is an inductive approach as the codes are said to 'come from the data' rather than text being assigned to pre-determined categories (Corbin and Strauss 2008). Grounded theorists prefer to give names to their codes through an *in vivo* approach, where the code name is derived from the text itself, rather than using other sources for the names, as it is thought to better reflect the data (Flick 2006). As each new piece of text is analysed, the model is examined to see if it is still valid, and it is modified as necessary (Bernard and Ryan 2010). This aspect of grounded theory analysis is sometimes referred to as the constant comparative method (Rose 1982), as data are continually being compared to each other to explore similarities and differences. The term grounded theory is often used in a much broader sense than was originally intended, with researchers often saying that a grounded theory approach was used in analysis, when they may simply mean that an inductive approach was used. I used a mainly inductive approach to data analysis, where the themes arose from the data, and code names were derived from the data. I chose to use Atlas.ti to aid my analysis, as it is a text management program which allows the creation of a codebook as you work through the data (Russell and Ryan 2010). The text from the questionnaire was imported into the software where it was coded along with the transcriptions from the focus groups.

At the deductive end of the continuum are methods such as content analysis. This is where text is tagged with codes generated from theory or prior knowledge (Bernard and Ryan 2010), although the codes can be modified if they are felt not to reflect the data well. The disadvantage of this approach is that categorisation of data based on theory may bias the researchers view of what the data is actually showing (Flick 2006). The goal of content

analysis is to reduce the amount of material and it involves adding up the number of occurrences of each code in the text (Silverman 2006). This is based on the principle that words and phrases that appear more often tend to be more important to the person who said or wrote it (Bernard and Ryan 2010). Although more commonly used in quantitative research, Silverman (2006) argues that content analysis can also be very useful in qualitative research, as the presentation of tables of codes and the frequency with which they appear in the data can provide the reader with a greater understanding of the data as a whole. Without showing this context, researchers can be accused of taking an anecdotal approach to analysis. Including data tables increases the transparency of the data analysis process and can increase the readers' confidence in the analysis (Silverman 2006). In this thesis, although I used an inductive approach to my analysis, I present codes and their frequency of occurrence in tabular form in order to show how the extracts of dialogue or written words that I chose fit in with the data as a whole. Prior to coding, I used the online software "Wordle" to help visualise the data, which displays the words in different sizes proportional to the number of times they are mentioned (Atkins and Wallace 2012). I used Wordle not only to show my data in a visual way, but also to help me begin my data analysis by highlighting dominant words.

Whether an inductive or deductive approach to analysis is used, there is usually a cyclical process taking place when analysing data, involving results being checked against data, data being used to refine results and so on. Tentative results are revised by checking through data, particularly looking for data which doesn't fit the developing theories (Rose 1982). Looking for data which doesn't seem to fit other patterns is sometimes referred to as deviant case analysis (Flick 2006).

Qualitative researchers aim to represent the data to the best of their ability, by being as true to the data as possible (Patton 2002). Being familiar with the data is an important part of being able to represent it well, and I ensured familiarity by doing my own transcription of the focus groups and reading through the transcripts carefully before coding began.

1.8 THESIS STRUCTURE

The thesis structure and research questions are shown in Figure 3. In Chapter 2 I explore what practitioners and their participants believe are the outcomes of environmental education, and compare these perspectives with each other and the limited literature on the topic. I also discuss differing views on the potential negative outcomes of environmental education, as these are rarely reported in the literature. In Chapter 3 I report on my findings about environmental educators' evaluation practice. I answer the

questions of how often practitioners evaluate, the forms the evaluation take, and why they evaluate. This then leads on to my final research question; what are the barriers to evaluation of environmental education. This is reported in Chapter 4, where I compare these perspectives with the limited research that has been conducted in this area. Chapter 5 pulls together all the conclusions and recommendations from previous chapters, discusses the limitations of the research, and suggests directions for future research.

Also included in Figure 3 are two additional questions that I had originally intended to address in more detail. One of the original aims was to create a “handbook” of evaluation tools that had been tried, tested and improved by practitioners, which could be shared with other environmental educators. Practitioners were asked to bring tools with them to the first focus group, and here we discussed each tool and the outcomes that practitioners felt it was able to measure. After the focus groups, with practitioners’ consent, I removed any logos and project specific information from the tools and they were circulated to all practitioners. After trialling over the summer, I planned to hold a second focus groups to allow practitioners to discuss their experiences of using the tools, using the reflective diaries to help guide discussion. Despite enthusiasm from all practitioners to trial methods and give their feedback using the reflective diaries, the majority of practitioners did not have time to do this. In addition, eight practitioners were made redundant or changed jobs during the course of the PhD, partly due to austerity cuts, and consequently only three practitioners returned reflective diaries after trialling evaluation tools. This gave me insufficient information to modify the tools and thus they were not developed any further than simply removing project information from them.

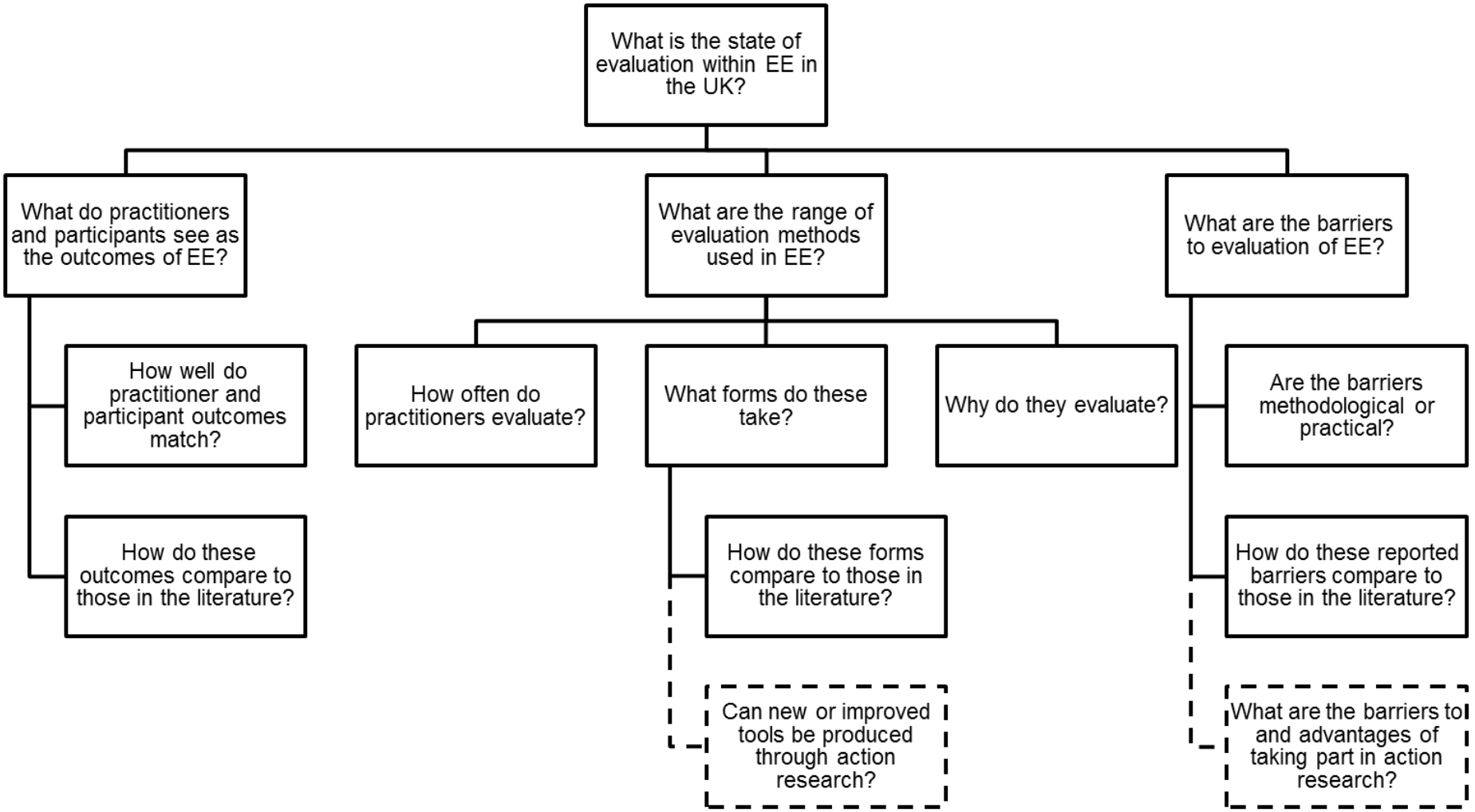

Figure 3 Thesis structure showing the research questions that this thesis intended to address. Boxes with dotted lines contain questions that were not able to be answered.

CHAPTER 2: UNDERSTANDING PARTICIPANT AND PRACTITIONER OUTCOMES OF ENVIRONMENTAL EDUCATION

2.1. INTRODUCTION

2.1.1 The aims of environmental education

Environmental education has been purported to deliver a wide range of benefits to individuals, society and the environment itself, by giving people knowledge about environmental issues and skills to help interpret their actions on the environment. Some of the personal benefits may include improved health (Pretty et al. 2009, Ulrich 1984), assisting with child development through natural play (Gill 2008), gaining practical skills (for example, communication and teaching others (Storksdieck et al. 2005)) or personal development skills, improving confidence and self-esteem (Schusler et al. 2009). Wider societal benefits may include increasing the scientific literacy of the general public (Trumbull et al. 2000), which in turn may increase acceptance of pro-environmental behaviour policies, or spending on scientific and environmental research (Couvet et al. 2008). Benefits to the environment may also include practical improvements such as restoration of natural ecosystems through educational projects, or increasing the biodiversity of gardens after participation in a project on garden birds (Evans et al. 2005).

At the 1975 UNEP meeting in Belgrade, the objectives of environmental education were formally set out. These focused on the benefits for the environment. A few years later, the Tbilisi Declaration (1978) stated that the purpose of environmental education is to increase people's knowledge about the environment, help them develop the skills needed to address environmental challenges, and foster positive attitudes towards the environment to motivate people to take responsible action towards the environment (UNESCO 1978). More recent definitions widen the field, for example, Davis (1998) noted that personal benefits can also be gained from environmental education. However, there is large disagreement on the goals and objectives of environmental education as it is such a broad field (Wals and Leij 1997), and surprisingly little research has been done to document what practitioners of environmental education see as the outcomes of their work, or what the participants feel may be the outcomes of their involvement. Wals and Leij (1997) argue that, if environmental education is to become rooted in society, it needs to be relevant to its participants, and thus practitioners need to ensure that they are working towards the goals and needs of participants, not just their own goals.

The assumption held by many involved in running environmental education projects is that participation in projects which involve contact with nature increases affection for the environment (Blanchet-Cohen 2008), which in turn leads to increased commitment and action towards the environment. This assumption may also underlie the Tbilisi Declaration and is based on an implicit acceptance of a model known as the information deficit model (Azjen and Fishbein 1980). This model is based on the assumption that people behave negatively towards the environment because they don't know any better. Therefore increasing environmental knowledge leads to a positive attitude towards the environment and pro-environmental behaviour (Figure 4).

Figure 4 Information deficit model (adapted from Kollmuss and Agyeman 2002)

However, there is an increasingly large body of research critiquing this linear view of pro-environmental behaviour. A recent review (Rickinson et al. 2004) of 150 pieces of research on formal (school and university based) outdoor learning challenged this widely held belief, with the authors stating that that increased environmental knowledge does not automatically lead to positive attitudes towards the environment and that these attitudes do not necessarily lead onto pro-environmental behaviour (see also McKenzie-Mohr and Smith 1999, Monroe et al. 2000, Kollmuss and Agyeman 2002 and Bogeholz 2006). As described in Chapter 1, there are many mediating factors that may cloud the links between attitude and behavioural intention and actual behaviour, for example, the extent to which an individual thinks their actions will earn them the respect of others (Eiser 1994). Kollmuss and Agyeman (2002) describe a large number of factors that can help or hinder pro-environmental behaviour, for example, demographic factors such as length of education, external factors including institutional barriers and economic factors, and internal factors such as motivation and environmental awareness. This study concluded that only a very small proportion of pro-environmental behaviour can be linked to environmental knowledge and awareness (Kollmuss and Agyeman 2002). This finding may be due to difficulties with assigning causality when there are many compounding factors, and for some individuals there may be a clearer link between environmental knowledge and behaviour.

After their extensive review of the environmental education literature, Rickinson and colleagues stated that much more work needs to be done to evaluate whether projects are successful in achieving attitudinal and behavioural change outcomes and, if so, why they have this success (Rickinson et al. 2004). Although individual studies have tried to assess the impact of programmes (mainly on the knowledge gained by participants after projects (Rickinson et al. 2004)), little research has been carried out into what practitioners believe the purpose of environmental education is (Schusler et al. 2009), or the outcomes of projects should be. This is an important oversight because identification of potential outcomes of projects is an essential first step in developing instruments to evaluate whether or not those outcomes have been achieved (Berk and Rossi 1990, Rowe and Frewer 2004). The move towards project staff evaluating their own projects rather than using external evaluators (Easton 1997) means that practitioners will need to identify the outcomes of their projects, so more research needs to be conducted into what practitioners and participants believe these outcomes may be.

2.1.2 Outcomes in evaluating environmental education

There are many different forms of evaluation (see Stufflebeam et al. 2000 for a review), but the majority of them involve looking at the outcomes of the project. Outcomes are variously defined in the literature as “measures of the impact you have had on people” (RCUK 2005, p33) and “the state of the target population or the social conditions that a program is expected to have changed” (Rossi et al. 2003, p 204). Other researchers and evaluators prefer to use the term objectives, defined as measurable things through which a project hopes to achieve its aims (RCUK 2005). Regardless of whether the term outcome or objective is used, it is important to better understand what the expected consequences of projects are, in order to be able to assess whether projects are being successful or not, and it is a critical first step for the vast majority of evaluation processes (Berk and Rossi 1990). The process of asking people responsible for designing programmes what impacts or outcomes their intervention is likely to have can be a valuable way of reinforcing the programme’s effectiveness, as it can encourage people to think more deeply about their projects and how they implement them (Easton 1997). It should be noted that when I use the word “outcomes”, I mean the effects (both positive and negative) that may arise from participation in a project. Clearly negative outcomes are not planned when projects are being designed, but it is important to acknowledge that any activity can have unintended side-effects (De Young 1993, Bixler and Floyd 1997).

This chapter covers my research into both practitioner and participant perspectives on the outcomes of environmental education. Despite an understanding of these being critical for project evaluation, there is a lack of research on this topic reported in the literature,

although it has been reported that the aims of environmental education are generally broader than those in formal education (Schauble et al. 1996, Ballantyne and Packer 2002, Hart 2007). In the context of museums, a non-formal learning environment similar to environmental education field centres (Dillon 2003), Hooper-Greenhill et al. (2003) explain that although museums and similar settings can have large impacts on their visitors in terms of increasing knowledge and skills, changing attitudes and values, these changes are poorly understood, as they are "soft" outcomes that can occur over a range of timescales (Hooper-Greenhill et al. 2003).

My research aims to discover what environmental educators see as the outcomes of their work with participants, and also what participants feel are the outcomes of taking part. These two perspectives will be compared with each other and the literature, in order to better understand the outcomes that environmental educators should be assessing in their evaluations. Figure 5 shows the questions that will be considered in this chapter and the methods that were used to address them.

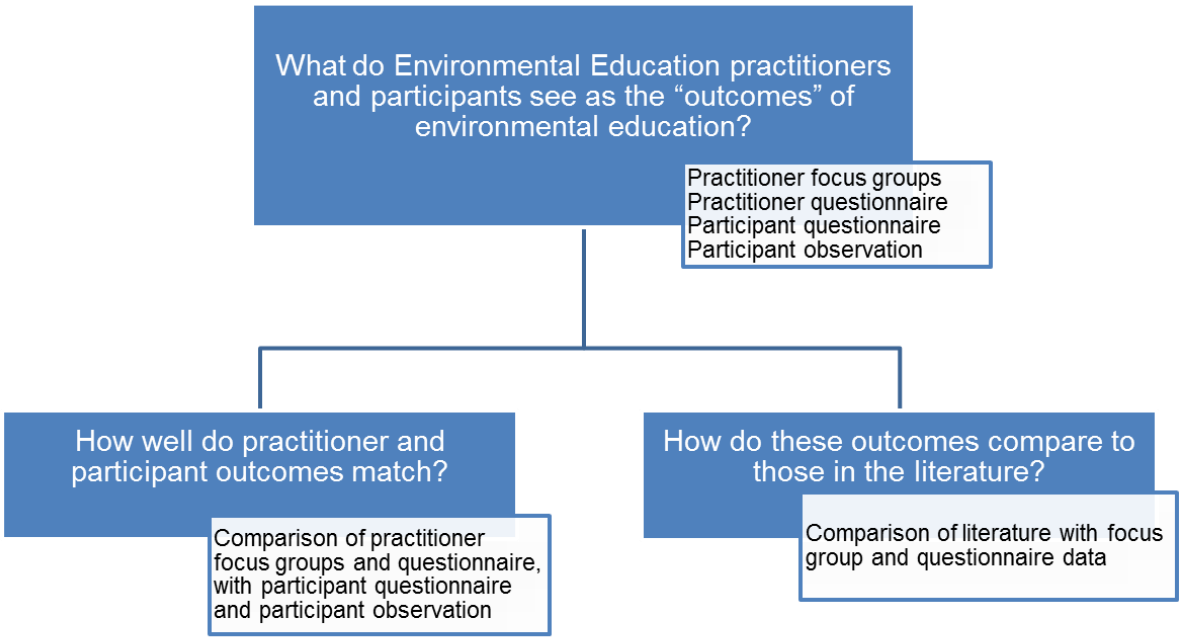

Figure 5 The research questions that will be considered in this chapter (blue boxes), with the methods used to answer them (white boxes).

2.2. METHODOLOGY

2.2.1 Practitioner questionnaire

The questionnaire for environmental education practitioners was designed using Survey Monkey (Pro). The questionnaire (see Table 1 for a summary) was made up of 14 questions, eight with multiple choice answers, and six open questions. There was space for comment after seven of the multiple choice questions. Responses to the first five questions provides background information about the respondents. The sixth question asked practitioners to list the potential outcomes of environmental education, and is the focus of this chapter. Questions 7 to 11 asked respondents about their evaluation practice, and questions 12 to 14 were designed to provide information to inform development of new evaluation methods.

Table 1 Questions and response type in the practitioner questionnaire. The full questionnaire can be found in Appendix 1

Question	Response type	Free text "Other" box?
1. What is the name of your organisation?	Open	N/A
2. What is your job title?	Open	N/A
3. What type of organisation do you work for?	Multiple choice	Yes
4. Which ages do you work with in your environmental education activities?	Multiple choice	No
5. What types of group do you work with?	Multiple choice	Yes
6. What do you see as the potential outcomes of environmental education. This could be for participants, for communities or for societies. Please list any you can think of.	Open	N/A
7. How important is evaluation in your work?	Multiple choice	Yes
8. How often do you evaluate your projects?	Multiple choice	Yes
9. Who carries out evaluations of your projects?	Multiple choice	Yes
10. If you currently evaluate your projects, what form does this take?	Multiple choice	Yes
11. What methods or tools have you used for evaluating your projects? (e.g. feedback questionnaire, drawings etc). If you haven't evaluated projects before, please write "not applicable".	Open	N/A
12. If you don't usually evaluate your projects, what would encourage you to do so?	Open	N/A
13. Do you think that new tools to help you evaluate your projects would be useful?	Multiple choice	Yes
14. What do you think would be the key features of an ideal evaluation method?	Open	N/A

The questionnaire was piloted with two practitioners who were not taking part in the research. They were asked to identify any questions they were confused about or found hard to answer. Question 6 was modified after feedback from the pilot, as the practitioners were unclear whether to list outcomes for individuals, the environment or society.

The questionnaire was administered between January and March 2011 to environmental educators using a convenience sampling strategy, via contacts I had made through my work as an environmental educator. The link to the online questionnaire, with a pdf copy as an alternative, was sent to OPAL partners with the request that they ask their local contacts to complete it. The questionnaire was also sent to organisations with the "Learning Outside the Classroom" badge, members of the public who receive OPAL emails (regionally and nationally), my personal Facebook contacts and to practitioners taking part in the focus groups. This ensured that a wide range of practitioners completed the survey from across the UK.

2.2.1.1 Practitioner respondent profiles

There were 42 practitioner respondents to the questionnaire, 17 of whom were from Yorkshire, with the remaining 25 from the rest of England and Wales. Although this is a relatively small sample, the design of the questionnaire, with open text and free text 'other' boxes (see Table 1) provides rich, detailed data, and participants spent a mean of just over 12 minutes (with a standard deviation of 6 minutes) completing the questionnaire. These times exclude two outliers, who spent over 45 minutes completing it, suggesting they may have got distracted.

Practitioners worked for a large range of organisations (Figure 6). The largest number of respondents were from the voluntary / charity sector, with the next largest from Non-Governmental Organisations.

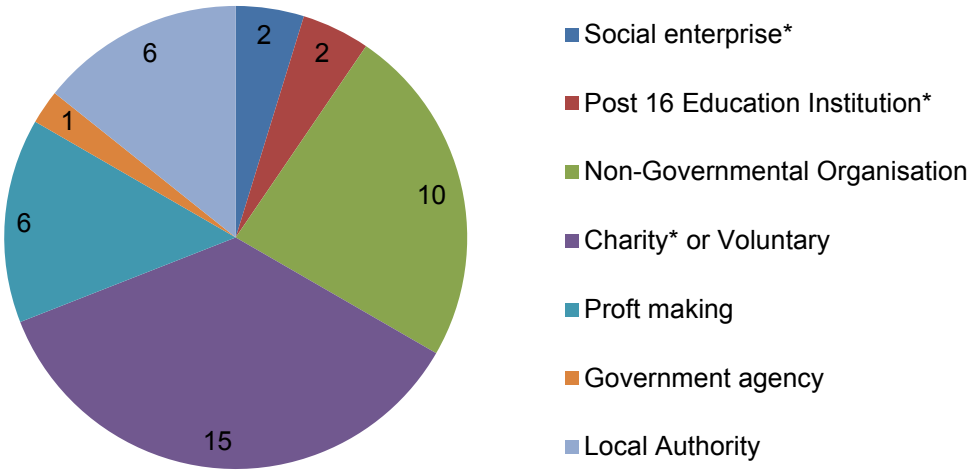

Figure 6 Types of organisations represented by questionnaire respondents. Respondents were given a list of options, including "Other" and a free-text box for elaboration. The additional categories suggested in this text box are indicated by an asterisk.

Questionnaire respondents worked with a wide range of age groups (Figure 7). Fifteen practitioners ticked all six age ranges, with only one selecting a single age group.

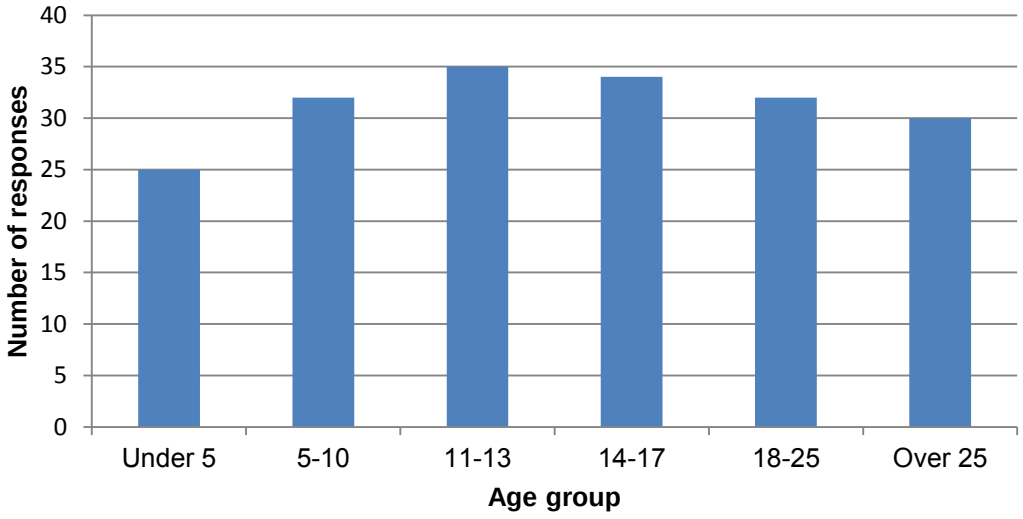

Figure 7 Age ranges that questionnaire respondents work with. Practitioners were able to tick as many responses as needed.

As well as working with a wide range of ages, the diversity of groups that individual practitioners work with is also high (Figure 8), with many practitioners selecting multiple groups. A majority of respondents (30) ticked “Other groups”, indicating that the range of groups I had suggested was too narrow. The text from the 30 responses to “Other groups” is shown in Figure 9, which emphasises the diversity of groups participating in

environmental education projects. Many of these are adult groups, highlighting the lifelong learning aspects of environmental education.

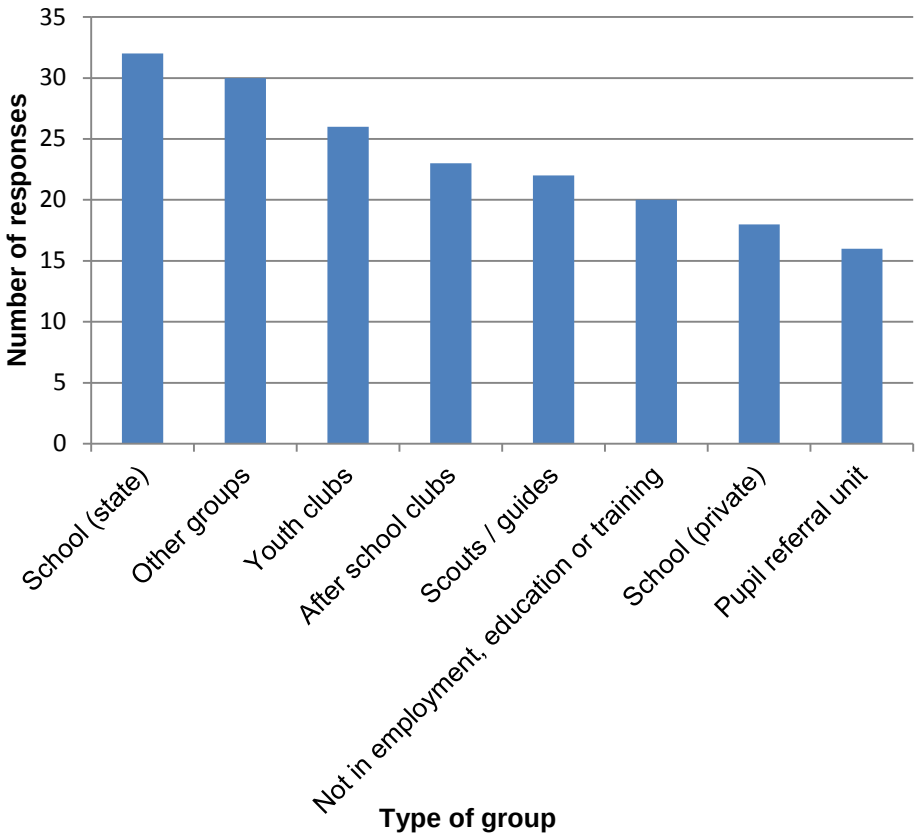

Figure 8 The range of groups that practitioners work with. Note that respondents were able to tick as many options as they wished, and there was a free text box for them to expand their answer if they responded "Other groups".

Figure 9 Wordle showing the range of different groups environmental educators work with. The larger the font, the more people mentioned the group name. "*Community groups*" was mentioned eight times.

2.2.2 Practitioner focus groups

Eight focus groups were conducted between February and May 2011. They were attended by 28 practitioners working in Yorkshire and the Humber, and provided an opportunity to discuss some of the themes raised by the questionnaire in more detail. Sixteen of those attending the focus groups also completed the questionnaire, although only fourteen did so before they attended the focus group. Focus group participants were recruited through a purposeful sampling methodology (Patton 2002), which allowed me to use my personal contacts to select participants to represent a range of organisations who deliver environmental education, including local council and non-governmental organisation employees and self-employed practitioners, working in both urban and rural areas across the region. After this initial sample was chosen, I contacted practitioners by telephone to invite them to attend, and then a snowballing technique (whereby practitioners suggested names of colleagues to contact) was used to gain sufficient numbers of practitioners.

Two focus groups were held in York, with one in Bradford, Ilkley (West Yorkshire), Sheffield, Barton-upon-Humber (North Lincolnshire), Wakefield and Shipley (West Yorkshire). The number of attendees varied between one (Ilkley), and five (York). Five more people had been due to attend, but three cancelled due to ill health and two cancelled without specifying a reason. Prior to the focus group, attendees were provided with an information sheet which explained the research, and ask to complete an ethical consent form (see Appendix 2), which included asking them whether they were happy to have their voices recorded and whether they wanted to be acknowledged in quotations, or for them to be anonymized, or not used. The majority of practitioners wanted quotations to be attributed to them personally, so those wanting anonymity have been given pseudonyms.

Each focus group lasted two hours and discussion followed a guide sheet, shown in Table 2. The first five discussion points are used in this chapter. At the beginning of the focus groups, practitioners were each provided with a list of outcomes of environmental education which had been generated from the responses to Question 6 of the questionnaire. They were asked to look through the list and discuss any outcomes they thought were missing, which were then added to the bottom of the list. Then I asked practitioners to rank the top five outcomes that they believed were most important in their work. After discussing the list and the rankings, I asked if there were any negative outcomes of environmental education.

Table 2 Topic Guide used for the focus groups

Introductions	Practitioners introduce themselves, how often they evaluate and any tools they brought with them
Discussion of outcomes	I show practitioners the list of outcomes generated from the questionnaire (Question 6) and previous focus groups (if applicable)
Discussion of outcomes	I ask practitioners to add any outcomes to the list that are missing, or remove outcomes. Practitioners discuss if they wish.
Ranking / "Top 5" exercise	I ask practitioners to choose the five outcomes that they feel are most important in their work and then to rank these five.
Discussion of negative outcomes	I ask practitioners why no negative outcomes have been discussed. Discussion on this topic if practitioners wish.
Paired discussion / "Matrix" exercise	In pairs (if enough participants), practitioners discuss the tools they use and match them to the list of outcomes
Summary to group	If time and interest allows, pairs feedback their discussion points to the group
Next steps discussion	I ask practitioners if they want to take part in trialling new evaluation methodologies and if so, how we should keep in touch

2.2.2.1 Profiles of practitioners attending focus groups

My sample of environmental educators was chosen to reflect the broad nature of the discipline, with practitioners working in both formal and non-formal contexts, and in the fields of nature education, sustainability education and environmental science education, although they did not tend to distinguish between these different types. The types of organisations represented by focus group practitioners is broadly similar to the questionnaire respondents (Figure 10).

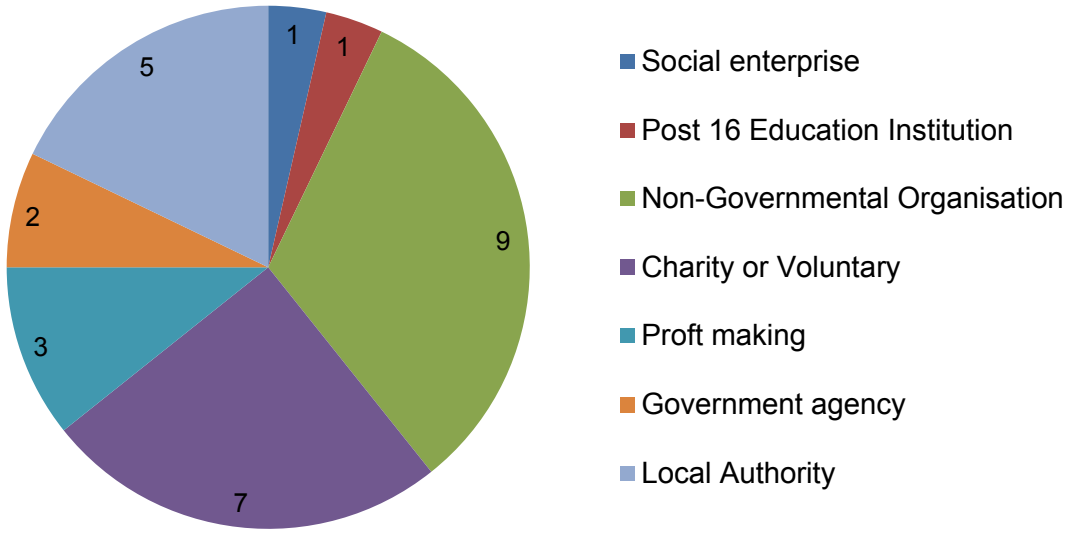

Figure 10 Types of organisations represented by practitioners attending the focus groups.

Table 3 provides some information about the organisations that practitioners work for and the learning contexts within which they work. The organisations represented include local authorities, Natural England, Forestry Commission, Wildlife Trusts, National Trust, smaller regional and local charities, with three self-employed practitioners.

Table 3 Practitioners participating in the focus groups, the organisation they represent and the types of education (formal or non-formal) that they conduct, ordered by size of organisation (smallest to largest). Practitioners wanting anonymity have been given a pseudonym, indicated by an asterisk. The final columns indicate those practitioners who also completed the questionnaire and those who gave feedback on drafts of the thesis.

Practitioner name	Type of organisation	Learning context	Completed questionnaire?	Respondent validation?	Reflective diary?
Graham	Self-employed practitioner	Formal and non-formal	Yes		
Janet	Self-employed practitioner	Formal and non-formal			
Roger	Self-employed practitioner	Formal and non-formal	Yes	Yes	
Chris	Volunteer leader of local conservation group	Non-formal (under 18s)	Yes		
Leilah	Small land-owning charity	Mainly non-formal with adults, some formal (under 11s)	Yes		
Jen	City park	Formal and non-formal, both on site and in schools	Yes		
Katherine	Arboretum	Formal and non-formal			
John	Nature museum, run by the local authority	Formal (all ages) and non-formal, in museum and surrounding countryside			
Sam	Further education college	Formal (mainly 16-18)	Yes		
Samantha	Field studies centre	Formal (all ages)			Yes
Jonathan	Field studies centre, and volunteers for a local nature reserve	Formal (all ages), and non-formal (all ages) at nature reserve	Yes	Yes	
Ruth	Outdoor education centre, run by the local authority	Formal (pre-school to college)			
Bev	City council, based at a country park	Mainly non-formal (all ages)			Yes
Andrew	District council, based at a country park	Formal and non-formal			
Coralie	Local charity providing opportunities for disadvantaged young people	Formal (alternative education)	Yes		
Maxwell	Local charity encouraging minority groups to engage with their local environment	Non-formal (under 18s)	Yes		
Heather*	Local charity encouraging sustainable lifestyles	Formal and non-formal	Yes		
Mick	National environmental regeneration charity with local branches. Based on a nature reserve	Formal and non-formal			
Hellen	National environmental regeneration charity with local branches. Based on several urban green spaces	Mainly non-formal with adults	Yes		
Nick	Local environmental education charity	Mainly non-formal with adults	Yes		

Continued overleaf…

Practitioner name	Type of organisation	Learning context	Completed questionnaire?	Respondent validation?	Reflective diary?
Emma	Regional charity promoting wildlife conservation	Formal and non-formal	Yes		
Anna*	Regional charity promoting wildlife conservation	Mainly formal (all ages), some non-formal			
Fiona*	Regional charity encouraging city residents to experience the countryside	Mainly non-formal	Yes		
Becky*	Regional charity promoting wildlife conservation	Formal and non-formal	Yes		
Alison	National charity focused on protecting built and natural heritage, based on one site	Formal (with young offenders) and non-formal (all ages)			Yes
Kevin	National charity focused on protecting wildlife, based on several sites in Yorkshire	Mainly formal (schools), some non-formal public events		Yes	
Kristel	National governmental organisation, based on several sites in Yorkshire	Formal and non-formal			
Cath	National governmental organisation, based on several sites in Yorkshire	Formal and non-formal	Yes		

As Table 3 shows, many of these practitioners also worked with a diverse range of groups. Heather, for example said that she is responsible for *"growing food with community groups, children, parents and toddlers, people with various problems, homelessness, drug abuse, blah blah blah".*

2.2.3 Participant questionnaire

A questionnaire for participants of environmental education projects in Yorkshire was administered between February and August 2012. This was designed to complement the practitioner questionnaire and focus groups by giving participants the opportunity to express their views on the outcomes of environmental education. The respondents were four groups of participants in projects run by practitioners involved in the research. The questionnaire was given to participants during the session. Table 4 shows the questions asked and the response types. A full copy of the questionnaire can be seen in Appendix 3. The questionnaire was piloted with two members of the public who were not part of the sample, and in Question 4 the wording was changed from "outcomes" to "benefits" as the feedback was that they were unclear as to what outcomes meant. Question 7 was modified to include the words "in general" as the feedback from the pilot respondents was that they were unsure about whether to respond specifically about evaluation of environmental projects or evaluation in general. Question 5 was included to prompt participants to think of any potential negative consequences of doing environmental projects, as none of the practitioners spontaneously suggested any negative outcomes of environmental education in their questionnaire responses or the focus groups.

Table 4 Questions and response type in the participant questionnaire.

Question	Response type	Free text "Other" box?
1. Which age category do you fit in?	Multiple choice	No
2. How often do you take part in environmental projects?	Multiple choice	Yes
3. What motivates you to take part in environmental projects?	Open	N/A
4. What do you see as the benefits of taking part in environmental projects? This could be for you as an individual, for communities, or for societies. Please list any you can think of	Open	N/A
5. What do you think are the negative consequences of taking part in environmental projects? Please list any you can think of	Open	N/A
6. When taking part in environmental projects, what types of evaluation or feedback, if any, does your group leader ask you for? (for example, paper forms, comments at the end of the day)	Open	N/A
7. How do you feel about giving feedback or evaluating projects in general?	Open	N/A

This chapter reports on the responses from Questions 3, 4 and 5. The responses to Questions 3 and 4 were grouped together for analysis as participant respondents often used the space after Question 4 to elaborate on their response to Question 3.

2.2.3.1 Respondent profile

Participant questionnaires were given out by practitioners on four different occasions, giving a total of 48 responses. Nineteen respondents were under 16, five were aged 16-25, 21 were aged 25-65 with the remaining three aged over 65. Table 5 shows that they varied in their amount of participation in environmental projects, with a fairly even spread between respondents who participate irregularly (once a year or less), every three or four months, and those who participate on at least a monthly basis. Nick conducted the questionnaire with a group he works with on a weekly basis (five respondents), whilst Hellen's event was a one-off evening bat walk attended mainly by families (15 respondents). Maxwell asked a youth group to complete the questionnaire (19 respondents), for many of these it was their first time taking part in an environmental education project. Lastly, Graham and I jointly ran a workshop for participants involved on a weekly basis (9 respondents). The small number of occasions on which questionnaires were administered means that participant responses are less likely to be representative than practitioner responses of environmental education more widely.

Table 5 Frequency with which respondents participate in environmental education projects. The first column shows the multiple choice question option and the second column shows the number of responses to that question.

Frequency of participation	Number of responses
First time taking part	10
Less than once a year	5
Once a year	1
Every 3 or 4 months	14
Once a month	5
Once a week	9
Other	3
Not answered	1

2.2.4 Participant observation

In February 2012, I attended a two day residential weekend with Bradford Environmental Education Service (BEES) as a participant observer. My aim was to gain greater insight into participants' perspectives on the outcomes of environmental education than could be gained through the questionnaire alone. My role was to take part in the activities with the

other participants and conduct informal interviews with them to gain insight into the outcomes they felt they gained from taking part in environmental education. Participants were also encouraged to leave feedback in the form of comments on three flip chart pads which were placed on walls in the hostel. The flip charts asked for comments about what people had learnt, their favourite bits so far, and how they would improve it in future. I took notes throughout the weekend about what participants said to me, and my observations of their participation in the feedback exercise. After the event these comments were typed up and used by BEES in a report to funders, and by myself to better understand what the participants felt they gained from the project.

Fifteen participants attended the BEES residential weekend, and interviews were conducted with ten of these. The aim of the weekend was to create a woodland clearing to benefit fritillaries and other butterflies. This involved felling trees, moving the brash and burning it, and putting logs aside for firewood. In the morning and evening, the group cooked together and socialised in the hostel. Several of the 15 volunteers were on long-term volunteering placements with BEES, most did activities with them every week, whilst others just attended BEES residential weekends. When I asked Nick, the residential leader, what he wanted the participants to gain from the weekend, he wrote '*Want people to be able express something about learning skills, having a deeper appreciation of the environment, more knowledge of the flora and fauna and an appreciation of being out in the countryside*'.

2.3 ANALYSIS

The focus group discussions were transcribed *verbatim*, and put into Atlas t.i version 6.1 along with both sets of questionnaire responses. Transcription is a time consuming process but ensures familiarity with the data (Patton 2002). Data were analysed qualitatively by coding the transcriptions into patterns or themes. Coding is a way of making sense of and summarising the rich and detailed information that can be gained through qualitative research (Constas 1992). The codes were derived from people's responses using a grounded theory approach, which is one in which the codes arise from the data, rather than quotations being assigned to pre-defined categories (Corbin and Strauss 2008). Coding took place after all focus groups had been transcribed, and the resulting text had been read through twice, which allows repeated themes in the text to be identified (Ryan and Bernard 2003). Most of the codes were named using an *in vivo* approach, which means that the category name comes directly from the responses (Constas 1992). During the coding process, it was sometimes necessary to merge or split categories as new insights arose from the data. In these cases, the quotations associated

with each code were printed out and recoded as necessary to ensure consistency. Some of the categories changed name over time, as new categories were added and a distinction needed to be drawn between them. The final codes relevant to this chapter can be seen in Table 6 and have been presented in order to increase transparency of the qualitative research process (Anfara et al. 2002). Tables have been created to show the frequency with which different codes were mentioned in the questionnaire responses and focus groups, to give an indication of the importance of different themes for practitioners and participants.

To visualise some of the free text data from the questionnaires and the focus group discussions, the online software "Wordle" was used. This can be a useful first step for identifying themes from transcripts (McNaught and Lam 2010) and visualising qualitative data. The responses from the questionnaire were run through a spell-checker and put into the Wordle software, which removes common words such as 'and' and 'the' and creates a visualisation of the text, with the size of the word corresponding to the number of times it was mentioned (Atkins and Wallace 2012).

2.4 FINDINGS

Practitioners listed a large number of outcomes of environmental education projects. Figure 11 shows the uncoded practitioner responses to Question 6 of the questionnaire, with the *words environment, natural, people, increased, knowledge, understanding* and *skills* being the most dominant words. The diversity of words in the Wordle reflects the wide range of organisations participating in the research, and the breadth of projects that they run. Even individual practitioners perceived multiple and quite diverse outcomes of their work, for example, a questionnaire respondent wrote; "*Physical exercise Mental wellbeing Connection to place Challenge and achievement Understanding of the environment Social interactions Community links Improvement of the environment*".

Figure 11 Wordle showing the words practitioners used in response to Question 6 of the questionnaire. The larger the word, the more times it was mentioned. The word *environment* was mentioned 43 times.

The responses from the participants tended to be shorter than practitioner responses and are shown in Figure 12. Here, the word environment is also dominant, but it is the same size as people, followed by good, and community, which do not feature strongly in the practitioner Wordle. Help and Local also feature fairly prominently in the participant Wordle.

Figure 12 Wordle showing the words participants used in response to Question 4 of the questionnaire. The larger the word, the more times it was mentioned. The word *environment* was mentioned 14 times.

From the practitioner questionnaire responses, I created a list of 21 different outcomes. These are shown in Table 6 along with the outcomes added by practitioners in the focus groups, and the outcomes derived from the participant questionnaire responses. I grouped the outcomes into those for the environment, for individuals, for the wider community and for the institution running the project.

Table 6 Outcomes generated from the practitioner questionnaire, the focus groups, and the participant questionnaire. Outcomes with * derived from the focus groups, ** from the participant questionnaire responses. “Final coding” column shows the code that I assigned each outcome to during analysis.

Outcome	Final coding	Outcome type
Appreciation of / empathy for nature	Appreciation of nature	Environment
Increased value of the environment to communities *	Appreciation of nature	
Encouraging care of environment / Fostering responsibility towards nature	Care for the environment	
Improved behaviours towards the environment	Improved behaviour towards the environment	
More volunteers *	Improved behaviour towards the environment	
Making the environment better	Improving the environment	
Increased knowledge / awareness of the natural world	Increasing knowledge of the environment	
Increased knowledge of human impacts on the environment / being part of nature	Knowledge of human impacts on environment	
Increased respect for / improved attitudes towards the environment	Respect for nature	
Awe and wonder *	Awe and wonder	Individual
Sense of space / being outdoors	Being outdoors	
Careers in science or environment *	Career in environment	
Extending horizons / connection to place *	Connection to place	
Spirituality / contentedness *	Creativity, imagination, spirituality	
Improved creativity / imagination *	Creativity, imagination, spirituality	
Filling time**	Filling time	
Sense of freedom *	Freedom	
Friendship *	Friendship	
Enjoyment / fun *	Fun	
Health and well-being (physical and mental) *	Health	
Challenging misconceptions *	Knowledge about the environment	
Increased confidence / self motivation *	Personal development	
Increasing resilience to change *	Personal development	
Helping to overcome risk aversion *	Personal development	

Continued overleaf…

Outcome	Final coding	Outcome type
Achieving personal goals	Personal development	Individual (cont.)
Inspiring people in general / raising aspirations *	Raising aspirations	
Overcoming fears *	Reducing fears	
Satisfaction**	Satisfaction	
Seeing wildlife**	Seeing wildlife	
Skills *	Skills	
Social skills *	Social skills	
Discussion with peers / gaining others opinions *	Social skills	
Teacher and student on the same level *	Social skills	
Community cohesion	Community cohesion	Community
Increased involvement of marginalised people *	Community cohesion	
Feeling part of a bigger picture *	Community cohesion	
Sense of belonging to a place	Sense of belonging to place	
Improving curricula	Improving curricula	
Meeting curriculum	Meeting curriculum	Institution
More volunteers	More volunteers	

As Table 6 shows, practitioners perceive there to be a wide range of different outcomes of environmental education. Practitioners listed particularly diverse outcomes for the individual, ranging from people achieving personal goals to overcoming their fears. There was less diversity in the outcomes for the environment, which were mainly about improving knowledge and changing behaviours towards the environment. Fewer outcomes were mentioned relating to the wider community, which were 'increased involvement of marginalised people' and giving participants a 'sense of belonging to place'. These findings support the limited previous literature which suggests that environmental educators have a wide range of opinions about the goals of their work (Hart 2007, Schusler et al. 2009).

Participant questionnaire responses added three outcomes to this list; filling time, giving a feeling of satisfaction, and seeing wildlife. Little research has been conducted into the outcomes that participants feel can occur through environmental education. This is an important research area, as understanding these outcomes will allow practitioners to design projects that meet the needs of their participants (Van Den Berg et al. 2009). Practitioners need to ensure that they are working to the goals of participants, not the outcomes that practitioners or educational researchers want (Wals and Leij 1997). It is particularly important to understand the benefits from participation in non-formal environmental education projects because the outcomes are likely to be wider than just learning-related (Storksdiek et al. 2005). The additional outcomes suggested by participants are more akin to outputs than outcomes, and this may reflect the use of the word "benefits" rather than "outcomes" in the questionnaire.

The number of times different outcomes were mentioned by questionnaire respondents and practitioners in the focus groups are shown in Table 7, along with the results of the focus group ranking exercise which was designed to indicate the importance practitioners place on different outcomes. It should be noted that many practitioners struggled with this exercise and instead of ranking their top five as anticipated, most ticked their top five outcomes. There is broad agreement between the frequency with which different outcomes were mentioned in the practitioner questionnaire responses and the frequency with which the outcomes were ticked in the focus group exercise. Participants suggested a smaller number of outcomes than practitioners did, possibly because they had a more limited experience of environmental education than practitioners. Participant responses tended to be shorter than practitioners too, for example "Plant trees." This may be because the questionnaire was administered as part of the environmental education session, and participants may have either wanted to get on with the activity, or go home, depending on when they completed it. This is clearly a limitation of this research. Overall,

participants mentioned outcomes for the individual most frequently, followed by outcomes for the environment. Like practitioners, outcomes for the wider community featured less strongly, and no-one mentioned outcomes for the institution delivering the environmental education project. Each of the different categories of outcomes will be considered in more detail next.

Table 7 Outcomes of environmental education, derived from questionnaire responses and focus group discussions. The first column shows the type of outcome, the second the outcome, and the third the frequency with which practitioners chose that outcome in the ranking exercise. The last columns show the frequency with which the outcome was mentioned in the questionnaire responses. A zero in the third column indicates that this outcome was not ticked, whilst a blank in the fourth and fifth columns indicates this outcome was not mentioned.

	Outcome	Frequency ticked by practitioners in top five ranking exercise	Frequency mentioned in practitioner questionnaire responses	Frequency mentioned in participant questionnaire responses
	Appreciation of nature	20	10	
	Knowledge about the environment	18	26	22
	Improved behaviour towards the environment	8	10	3
	Respect for nature	8	6	1
	Knowledge of human impacts on environment	6	10	2
	Care for the environment	4	10	10
Environment	Improving the environment	1	4	17
	Total	**65**	**76**	**56**
	Fun	15	6	8
	Health	8	14	10
	Career in environment	7	2	5
	Social skills	6	4	2
	Creativity, imagination, spirituality	5	1	
	Raising aspirations	5		
	Awe and wonder	4	2	
	Personal development	3	7	
	Skills	3	8	3
	Being outdoors	1	2	10
	Connection to place	1		
	Reducing fears	1		
	Friendship	0	2	10
	Seeing wildlife			7
	Satisfaction			4
Individual	Filling time			2
	Total	**59**	**48**	**61**

Continued overleaf…

	Outcome	Frequency ticked by practitioners in top five ranking exercise	Frequency mentioned in practitioner questionnaire responses	Frequency mentioned in participant questionnaire responses
Community	Community cohesion	8	4	6
	Improving curricula	0	8	
	Sense of belonging to place	0	4	4
	Teaching others			5
	Total	**8**	**16**	**15**
Institutional	Meeting curriculum	2	1	
	More volunteers	1	3	1
	Total	**3**	**4**	**1**

2.4.1 Outcomes for the environment

Outcomes for the environment featured more strongly in practitioner questionnaire responses and the focus group ranking exercise than outcomes for individuals, the community or institutions (Table 7).

2.4.1.1 Knowledge about the environment

Knowledge about the environment was the outcome mentioned most frequently by practitioners and participants in the questionnaire responses, and more than half of practitioners ticked this outcome during the ranking exercise. During the focus groups, lack of knowledge of participants was frequently discussed using anecdotes to highlight the importance of their work

"I had to explain to this class what grass was… They had no conception of a lawn or grass, but they live 16 or 17 flights of stairs up a high rise flats all these kids, haven't got a clue, the whole class." (Janet).

According to the literature (see Rickinson et al. 2004; Bogeholz 2006; Hattie et al. 2007; Blanchet-Cohen 2008, Monroe 2010), practitioners commonly assume that participants who have their knowledge of the environment increased also gain a greater appreciation of the natural world, more positive attitudes towards the environment and ultimately exhibit improved behaviour towards the environment. This is known as the information deficit model, and widespread acceptance of this model may have arisen because predicting environmental behaviours appears so complex (Hungerford and Volk 1990). My research appears to support the reported prevalence of this assumption, with many practitioners using phrases that suggest they assume that an increased knowledge of the environment will automatically lead to increased affection for, and good behaviour towards, the environment. For example, a questionnaire respondent wrote as one of their outcomes "*Well informed individuals who are motivated to make choices to live sustainably based on a grounding in accurate up to date information.*", and another responded "*Helping people to feel connected to the natural world so that they care for it more themselves, and support political choices that care for it too."* Ruth was one of the focus group practitioners those who expressed this view "*improved behaviour towards the environment, follows on from kind of the increased knowledge and awareness of the natural world".* Graham explained this in more detail

"So if people gave you lots of positive ticks then it is likely that, after doing that programme, that you got across the right messages and the students will go away with an improved knowledge of their impact on the natural environment...and that goes for a lot of the others, improved behaviour and empathy towards the environment, if your quality of teaching gets really good ticks then the chances are, I think it's a very high chance, that you have improved those aspects."

Another practitioner seemed to share this view, when they wrote during the matrix exercise in the focus group *"Whether these outcomes are measured by this tool will partly depend on the activity. If people enjoyed it then this will help lead to health benefits, increased confidence and self-motivation and contentedness"*. When I asked one focus group to look at the list of outcomes and suggest any they thought needed adding removing, Katherine said *"looking at your list with improved behaviours towards and improved attitudes towards the environment, I would put that, would say they were the same things."* Alison responded with *"Yes, I see what you mean there*" and Katherine expanded her point with *"those two are, you won't have increased respect without improved behaviour, you won't have improved behaviour without increased respect, they are, I kind of think of them as the same thing.*" I asked if others in the focus group agreed or not, and they all said that they thought they were "*pretty similar".*

Only Kristel challenged this assumption in another focus group by saying "*if all the boxes were ticked outstanding…then you'd think that the children's knowledge was increased by what you did and they had more awareness of the natural world, but again, that's just from reading between the lines I suppose.*" Monroe (2010), wrote that "[a]n inherent belief that awareness and knowledge will lead to conservation behavior, even when the program does not teach about the behavior, pervades the environmental education community" (p. 195) and this does seem to be the case with my sample of environmental educators.

Outcomes relating to environmental behaviour change, such as 'care for the environment' and 'improving the environment' were ticked relatively infrequently in the focus group selection exercise (Table 7), and do not feature very highly in the practitioner questionnaire responses. Given the explicit mention of encouraging attitudinal and behaviour changes in the Tbilisi Declaration (Unesco 1978), I might have expected these outcomes to have been ranked higher by practitioners, and this may be because practitioners feel these will automatically arise from the increased knowledge. The widespread belief in the information deficit model is problematic because there is an increasing body of evidence that this process can break down at all stages, and it may be that only a very small proportion of pro-environmental behaviour can be linked to

environmental knowledge. This is termed the knowledge-behaviour gap (Kollmuss and Agyeman 2002). Environmental knowledge should be considered as just one of many important components of pro-environmental behaviour (Jensen 2002). None of the focus group practitioners challenged the assumption that knowledge automatically leads to behaviour when these views were expressed. Participants seemed to be more cautious about assuming large behavioural change outcomes than practitioners, for example, one respondent wrote "*I guess these types of projects could become a point of awareness and action for the environment.*"

As the code 'increasing knowledge about the environment' was so dominant in practitioner and participant responses, the comments relating to it warrant inspection in more detail. The Wordles in Figure 14 and Figure 13 show that there are some clear differences in the language and topics mentioned. In general, the words practitioners used tended to be more technical. The most dominant words in the participant Wordle were *learn* and *learning*. This supports research by Ryan and colleagues (2001) who surveyed 150 environmental volunteers and found that learning and helping the environment were the top motivations. Van Den Berg et al. (2009) also found that learning was a particularly important motivation for adults participating in an environmental project. Ballantyne and Packer (2002) administered a questionnaire to nearly 500 school children about their expectations of environmental education, and found that less than a fifth said they were looking forward to learning about the environment, which is a clear contrast with my sample. However, this discrepancy can be explained by the fact that their respondents were on a compulsory school trip, whereas my respondents had chosen to attend the activities.

The word *skills* is also more prominent in the participant Wordle (Figure 14) than the practitioner Wordle (Figure 13), and discussions with the BEES participants revealed that, for some participants, the desire to learn new skills was motivated by a wish to improve future career prospects. Another obvious difference between these figures is that participants use the words *nature* and *wildlife* much more than practitioners did. *"Seeing wildlife*" was mentioned by several of the participants as a benefit of participation in environmental education, whereas this was not mentioned in practitioner questionnaire responses.

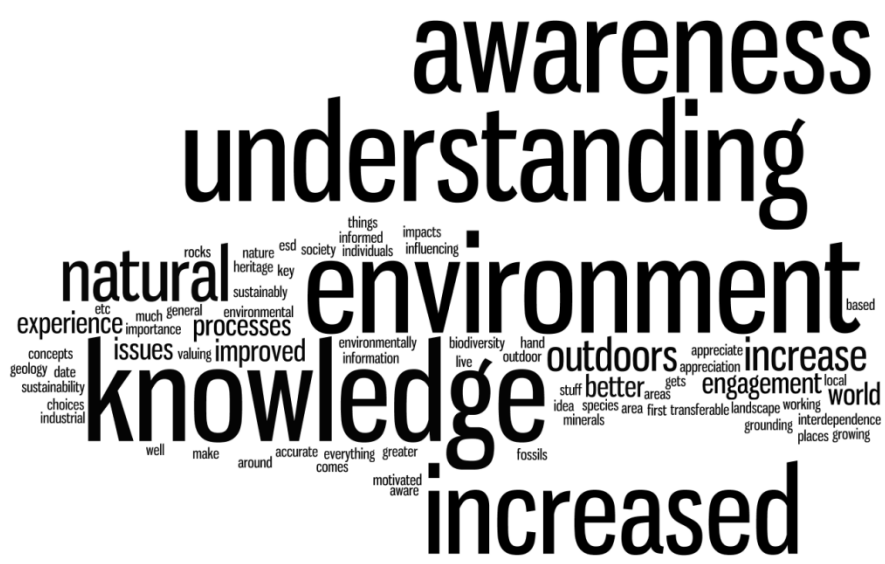

Figure 13 Wordle of the words practitioners used related to the code “increasing knowledge of the environment”. The largest words were mentioned 9 times.

Figure 14 Wordle of the words participants used related to the code “increasing knowledge of the environment”. The largest words were mentioned 8 times.

More research is needed into the meanings that participants and practitioners ascribe to words such as nature and wildlife. The differences in the Wordles may partly reflect a limitation of this research; that the questionnaire asked practitioners to list outcomes, whilst participants were asked about benefits. Alternatively, it may be that for participants, the process of participation and the actual activity are more important than the end result, which may also be supported by the dominance of the word skill in the participant Wordle.

2.4.1.2 Other outcomes for the environment

The majority of focus group practitioners (20 out of 28) ticked 'appreciation of nature' as one of their top five outcomes of environmental education (Table 7), highlighting the importance they place on encouraging participants to appreciate the natural world. 'Improving behaviour towards the environment' and 'encouraging respect for nature' were selected by eight practitioners.

Only six practitioners selected 'increasing knowledge about human impacts on the environment', suggesting that these practitioners are teaching more about the natural world itself rather than human interactions with it. The codes 'care for the environment' and 'improving the environment' were also not frequently ticked by practitioners, perhaps because few of them were involved in running practical conservation activities. These outcomes were mentioned more frequently by participants, with ten respondents referring to 'care for the environment' and 18 talking about 'improving the environment'. This may be a reflection of the activities that participants were engaging in, for example, the session at which Maxwell administered the questionnaire involved planting trees.

2.4.2 Outcomes for individuals

Outcomes for the individual were mentioned less frequently in practitioner questionnaire responses (48 times) than outcomes for the environment (76 times) (see Table 7), suggesting that perhaps they are less important for practitioners than the environmental outcomes. The focus group ranking exercise would also support this, with a relatively small number of practitioners ticking personal development outcomes such as 'reducing fears' and 'raising aspirations'. The practitioners who did tick these outcomes as most important for them worked with what could be considered 'problem' adolescents, for example, Mick said *"I suspect for some of those lads, the ones that are either in bother or in danger of getting into bother, it's the first time that they have come across role models who show them how to do constructive things, and then praise them for actually having done it."* Maxwell also saw himself as a role model "*I am hoping that I can help some of these people, especially the young people that I am working with, to become future scientists or ecologists. To me that is it. I view myself as a role model. If they don't work out, fair enough if it doesn't, but that's my objective to be honest with you.*" Two of the participants specifically mentioned attending environmental education projects to enhance their CVs, with many more talking about attending to improve their knowledge of the environment (see Table 7 and Figure 12).

Participants frequently mentioned outcomes for the individual, with more comments relating to this than outcomes for the environment (Table 7) highlighting the personal and social benefits of participation. It may be that participants just see environmental education projects as a space in which individual outcomes (such as improving career prospects through learning new skills) can be achieved, but more research is needed to ascertain this. Certainly *learn* and *learning* were fairly dominant in the participant responses, as previously discussed.

Improved health is a personal outcome that was mentioned frequently by both practitioners and participants. A BEES participant gave details of how she benefits from taking part in environmental education projects *"Well, I first started volunteering with BEES as I was interested in the outdoors and I've got SAD* [Seasonal Affective Disorder] *you know? So it really helps me at this time of year."* There is now a considerable amount of literature to support the notion that spending time outdoors improves both physical health (Pretty et al. 2009) and mental health (Mind 2007), and that people who exercise outdoors are more likely to continue their exercise in the long term compared to those who exercise indoors. Some practitioners received funding to support healthy walking or healthy eating initiatives.

Over half of the practitioners selected 'Fun' as one of their key outcomes in the ranking exercise, supporting research by Taylor (2006) where practitioners placed high emphasis on the educational experience being fun. This also supports previous research that suggests for some informal learning institutions, goals such as encouraging social interaction are given higher priority than learning (Schuable et al. 1996). As learning is fundamentally a social phenomenon (Wenger 2009), a friendly, sociable environment may help to encourage positive learning experiences. Fun and friendship were mentioned fairly frequently by participants in their questionnaire responses (eight and ten times respectively). Meeting like-minded individuals was also found to be an important motivation in Van Den Berg and colleagues' study (2009).

For the BEES participants, social aspects of the experience were particularly important e.g. *"For me, the social aspect is really important, I come to meet people"* (Weekly volunteer), and one said that he *"wanted to learn about British people and life"*. Several of the participants said that they didn't really mind where they went, or what activity they did, they just came for social reasons "*We come on the residential for the people"* (weekly volunteer). This supports the findings from the participant questionnaire, with ten respondents mentioning friendship as an outcome (Table 7). However, none of the

practitioners included friendship in their top five outcomes, and it was only mentioned twice in the practitioner questionnaire.

For four of the participant questionnaire respondents, taking part in environmental education projects gave them a feeling of satisfaction. This feeling was also expressed in one of the interviews with the BEES volunteers *"As an unemployed person, I just think it is good to get out and do something positive. I mean, unemployed people get blamed for all the bad stuff in society, you know, so it's good to get out and be able to do something useful"* (Weekly volunteer). None of the practitioners specifically mentioned giving participants feelings of satisfaction.

In one of the few pieces of research investigating practitioner perceptions of the outcomes of environmental education, Schusler et al. (2009) found that personal development for young people was very important for practitioners, and in their paper, their definition of personal development includes things like opportunities for improving self-esteem and gaining new skills. The practitioners involved in my focus groups also seem to share this view, with outcomes for the individual receiving only slightly fewer ticks in the ranking exercise (59) than outcomes for the environment (65). In the focus groups, practitioners added many outcomes relating to personal development, highlighting the range of individual benefits they feel that participants can gain. The emphasis on the personal benefits of environmental education is not reflected so clearly in the practitioner questionnaire responses, perhaps highlighting the need for these practitioners to spend more time discussing project goals with their participants.

2.4.3 Outcomes for the wider community

A smaller range of outcomes relating to the wider community were suggested by practitioners and participants, including encouraging community cohesion and a sense of belonging to place. Eight practitioner questionnaire respondents mentioned improving school curricula as an outcome of environmental education, for example "*Many children are not best served by the current educational system in the UK based on the national curriculum in buildings instead of based on children's needs and desires in natural environments."* (questionnaire respondent). I have categorised this as a wider community outcome, although discussion with the respondents would be needed to ascertain exactly how these practitioners see their work influencing development of curricula.

Encouraging community cohesion was ranked by eight focus group practitioners as one of the most important outcomes, although it was only mentioned four times by practitioners

responding to the questionnaire. Community cohesion and sense of belonging to place were themes that were mentioned by a minority of the participants in their responses to the questionnaire and several also gave specific examples of caring for or improving the local environment, for example, "*Looking after green areas in Leeds*". The words *help* and *local* were used fairly frequently by participants (see Figure 12), perhaps supporting previous research that suggests people are more concerned about local issues than global ones (Burningham and Thrush 2001). Alternatively, it may be that people find it easier to articulate local issues, or that the place-based environmental education activities that this limited sample of participants were involved in meant that these issues were at the forefront of their minds. However, during discussions with the BEES participants, several made comments that suggested a strong connection to the places they visited. Experiencing new places was also important for several of the BEES participants, for example, a weekly volunteer *said "I like seeing part of the landscape that I don't know, and get out of Bradford which has few parks. It's not a very green city".* This may be a reflection of this particular group, many of whom had recently moved to Bradford from other parts of the country or from abroad. Emma, one of the practitioners, talked about how she uses the attachment to place in her education work "*I sometimes play the NIMBY* [Not in my backyard] *card thing I'm afraid, because NIMBY does appeal to a lot of people…we talk about what it would be like to live next to a landfill site…I hate NIMBYism but…you do tend to play that card a little bit.*"

2.4.4 Outcomes for institutions

Only two outcomes for the institutions involved in running environmental education programmes were mentioned by practitioners; generating more volunteers to help support the organisation, and meeting the curriculum (Table 7). Although generating new volunteers was only mentioned three times by practitioners in the questionnaire responses, one of the practitioners chose this as one of their top outcomes in the focus group ranking exercise, as they felt that recruiting volunteers and financial supporters was an important part of their role. Meeting the curriculum was chosen by two practitioners in the ranking exercise. It should be noted that meeting the curriculum is more of an output than an outcome, as it is not a change that occurs as a result of the programme, rather it is part of the process of the programme. Ellis and Gregory (2008) report that many of the organisations responding to their study of evaluation in the third sector appeared to struggle with the concept of outcomes, and there may also be some confusion in terminology amongst my sample.

2.4.5 Conflicting priorities

An unexpected result from the focus groups was that, during the ranking exercise, several practitioners said that they thought their personal top five outcomes would be different to their employers top five. These practitioners decided to do the exercise twice, once for their own outcomes and once thinking about their employers. These are shown in Table 8. It should be noted that whilst 26 people completed their own personal key outcomes (see Table 7), only twelve gave their views on what their thought their employers key outcomes were, hence the smaller numbers in this table.

Table 8 Practitioners perceptions of their employers top five. Note that only 12 practitioners completed this activity.

	Outcome	Frequency ticked in employers top 5
Environment	Appreciation of nature	8
	Knowledge about the environment	5
	Improving the environment	5
	Improved behaviour towards the environment	4
	Knowledge of human impacts on environment	2
	Care for the environment	2
	Respect for nature	2
	Total	**28**
Individual	Health	5
	Creativity, imagination, spirituality	2
	Friendship	2
	Fun	2
	Personal development	2
	Raising aspirations	2
	Skills	2
	Social skills	2
	Career in environment	1
	Total	**20**
Community	Community cohesion	8
	Total	**8**
Institutional	Meeting curriculum	3
	More volunteers	3
	Total	**6**

Despite five practitioners saying they felt that their personal outcomes were very different to those of their employers, e.g. *"I've just noticed that I've effectively got two hats, someone who is employed by the council and someone who has their own understandings."* (John) and *"all of mine are different to all of the organisations!"* (Coralie), the similarities between Table 7 and Table 8 indicate that although individual practitioners

may have felt their own personal goals of their work were different to their employers, considered as a whole, the outcomes are similar. One of the obvious differences between these tables is that practitioners who placed greater emphasis on "Fun" than they felt their employers did, for example, Sam said *"I had some naughty students…and they sort of ran off through the woods and were hiding, while John was doing his talk…I was annoyed with them, but at least they had a really fun time…they'd have gone home and gone 'ah do you remember when we went to Shipley Glen and ran off in the woods', and that's a positive thing to go away with. Not in terms of my employers perspective, but…"*. Sam felt her employer was more interested in delivering the curriculum.

Many practitioners struggled with the focus group ranking exercise. One reason for this may be that they had not thought much about the outcomes of their work before, as Rovira (2000) notes that many environmental education projects lack clear objectives. It may also be due to the diversity of projects that they run; "*within your own organisation, it depends which department or which of the managers you talk to"* (Kevin) as *"different programmes offer different things"* (Ruth). This may be because practitioners and their organisations have to seek different types of funding, as Sam alluded to: *"Do you think it's linked to funding streams then? Cus like you said then, health, and I know that that is a funding stream isn't it? People say, 'oh if we could get some funding for forest schools through the health aspect'."* Maxwell offered another explanation for why employer personal goals might differ; *"What we do in an organisation, we're doing it because an organisation has, what do you call it? A policy agenda that it has to follow, and you also, you've also got your own personal reasons why you are doing things".* An example is 'improving the environment', which was ticked five times by practitioners as one of their employers top goals, because they were employed by an organisation that received money from doing practical improvement tasks. Ellis and Gregory (2008) note that the targets that funders want to achieve may not be well matched with the immediate outcomes for participants, and this tension may have contributed to the difficulties some practitioners faced when completing this exercise.

In addition, there was some discussion in the focus groups about the differing outcomes expected from the education provider and the schools or other organisations attending, or as Coralie put it "*there is the difference between our objectives and their objectives and there will be a lot of crossover but not everything will match*". Kevin went into more detail about this when he said "*Clearly from our point of view we know that our programmes address certain learning objectives and outcomes from the national curriculum… [but] quite often if a school rings up and you know, we still get quite a lot of the 'what do you want out of the day?', 'well we want a nice day out', which is not really what Ofsted and*

other people are looking for and it is quite hard to assess anything with something quite that nebulous really isn't it?". Kevin was one of the few practitioners who expressed clear learning objectives of their programmes. The differing expectations of environmental education can cause challenges when evaluating projects, and this will be considered further in Chapter 4.

2.4.6 Negative outcomes

Any intervention to encourage a change of behaviour can have unintended negative side-effects, but research suggests that this fact has been underappreciated by practitioners and researchers (De Young 1993), with reports that many people assume that environmental education is always a positive experience. For example, Hattie et al. (1997) 'were struck by the number of research papers that read more like program advertisements' (p. 45) as the papers that did include information on project evaluation seemed to ignore negative aspects and only highlight positive findings. This is also the case when public engagement projects are reported (Rowe et al. 2008). In the social work literature, if the effects on participants of being involved in nature based projects are discussed at all, they are assumed to be positive (Bandoroff and Scherer 1994, Ungar et al. 2005). These findings are supported by the fact that in both the questionnaire and the focus groups, none of the practitioners spontaneously mentioned any potential negative outcomes of environmental education. After prompting in the focus groups, some practitioners stated they believed there to be no negative outcomes of environmental education at all. A small number of practitioners did discuss negative outcomes, and these are shown in Figure 15. Damage to the environment was mentioned most often (nine practitioners). Kristel gave an example from her experience *"we did willow weaving with the school and one of the children asked 'where did the willow come from' and I said 'from the reserve'. And he took from that that on the weekend him and his dad could go down and cut the willow for their garden. So I guess that's one negative, but at the same time you could see that as a positive, I got him to come to the reserve again!"*

Over a third of participants did not list any negative outcomes of environmental education despite the addition of this question in the questionnaire. Those who did respond to this question suggested a broader range of negative outcomes than the practitioners did in the focus groups (see Figure 16). Damage to the environment also featured most prominently in the participant responses, for example "*Perhaps if the project hadn't been thought through properly, then it could actually be worse for the environment than to leave it alone*." and "*Inexperienced volunteers sometimes do more harm than good*". One participant explained this point further "*Because of my poor skills, I am not sure that I*

performed some tasks as directed. For example, when I cut wood in hedge-laying, I think that some were too deep and other were too shallow. I hope there will not be [a] bad impact there". Five people mentioned they might get injured during participation, all these participants had recently had a health and safety talk from Maxwell about the activity. The other negative outcomes were only raised by a maximum of three participants, and were more varied than those suggested by practitioners. Three of the participants felt that the activities they do voluntarily as part of environmental education should be work that they get paid for e.g. *"Maybe people resent volunteering for a job they could be paid for".* Another respondent had the opposite view and wrote *"The council can't do work for the environment, so I like being able to do something good for the environment"*.

Bad weather being off-putting to participants was raised by several practitioners; "*They get cold, they get wet, they get dirty, they get miserable…So there can be physical things that are a negative for them, and they'll think next time it is offered, 'no thank you, I don't want to do that*'" (Heather). This supports findings from the few previous published research projects that address negative aspects of contact with nature; in focus groups with teenagers Ward-Thompson et al. (2006) report that bad weather and lack of comfort were the key things they disliked about spending time outdoors, and in another study teenagers expressed discomfort and disgust about nature (Wilhelm and Schneider 2005). However, neither bad weather nor discomfort featured highly in participant responses, with only one mention of bad weather and two of discomfort e.g. *"Sweat hot cold dirty."* Three of the teenage participants expressed that by doing environmental education activities they might be missing out on more exciting alternatives, which may suggest that they feel the environment can be boring, which would support previous research with teenagers by Bell et al. (2003).

In general, practitioners had very positive attitudes, for example, when I asked why no-one had listed any negative outcomes, a typical response was "*because to be a field teacher you have to have a positive attitude. You're up against so much, you're up against time, getting them through the work and back to the bus, you're up against the weather. You've got to have a positive attitude, 'just think about the positives' Also, we want to promote field work, we don't want to think about the negatives*" (Graham). In the few cases where negative outcomes of environmental education were discussed, they talked about how they could be used to highlight important lessons, again emphasising their positive attitudes, for example, John uses nettle stings as a learning opportunity: "*it allows you to explain...why the nettle was able to do that, so it explains a bit more about plant protection*".

The only practitioner who mentioned a negative outcome of her work that could not be used as a learning experience was Jenny, whose project involves taking people out of a deprived part of a city into the countryside; "*I think sometimes, particularly with some of the groups that we work with, going to a nice place can make them realise how rubbish their life back home is. Sometimes. Not very often. I think it can sometimes have a negative impact because often these people aren't in control of where they are at at the moment. But it is very few people, a very small number*".

Figure 15 Wordle of the negative outcomes of environmental education mentioned in the focus groups. The larger the phrase, the more times it was mentioned. "Damage to the environment" was mentioned 9 times, whilst the smallest phrases e.g. "Environment is boring" was mentioned only once.

Figure 16 Wordle of the negative outcomes of environmental education mentioned in the participant questionnaire. The larger the phrase, the more times it was mentioned. The largest phrase "Damage to the environment" was mentioned 9 times, whilst the smallest phrases e.g. "Lack of control over sites" were only mentioned once.

Chris said he found the focus group discussion of negative outcomes useful "*so that then you can work to overcome them, especially because you do end up in this cocoon, when you are working with people who are all passionate as well, it is easy to forget that there are people out there who don't particularly like doing this sort of thing*", which he thought was "*probably the majority of the population to be fair, and so I think it is good to remind ourselves every now and then that that is the case*".

Other researchers have commented on the positive outlook of environmental educators; Monroe (2010) describes the "unbridled optimism of environmental educators as they save the world" (p. 194). The RCUK evaluation handbook notes that people do not generally like reporting negative outcomes and suggests presenting them as "lessons learned" instead, so that others can learn from the experience (RCUK 2005).

2.5 CONCLUSIONS

The perspectives of practitioners and participants on the outcomes of environmental education projects is an important and under-studied research area and in this Chapter I have explored these perspectives and compared them to the limited literature on the topic. Listing the potential outcomes of projects can be an important first step in project evaluation, which is essential for demonstrating the value of environmental education programmes to society. Understanding participants' aspirations for environmental education is useful for ensuring that it meets their needs and they continue engaging with it.

These practitioners commonly juggle multiple projects, working in formal and non-formal spheres, with each project having differing intended outcomes. Consequently, the list of potential outcomes generated by practitioners is long, supporting previous literature which suggests that practitioners have a wide range of opinions about the outcomes of their work (Hart 2007, Schusler et al. 2009). The outcomes suggested by these practitioners include personal ones such as new practical and social skills, and deep societal outcomes such as improved community cohesion, as well as outcomes for the environment, which were the ones most frequently mentioned in the practitioner questionnaire. Some of the comments made in the questionnaires and focus groups suggested that these practitioners assume that increases in knowledge automatically leads to improved attitudes and behaviour towards the environment, despite a growing body of research indicating this is not the case (e.g. Kollmuss and Agyeman 2002). Between environmental educators there was a large range of views of the relative importance of different potential outcomes, which is unsurprising given the breadth of different organisations represented in the sample, and the range of projects they run.

Participants also identified a large number of potential outcomes of environmental education, although many of these were quite vague, for example "*Taking care of the planet's future"* (Participant questionnaire respondent). There were some differences between the outcomes mentioned by practitioners and their participants. Participants focused more on the personal benefits (such as learning new skills) they gained from taking part in projects than practitioners did. Learning new things was particularly important for participants, and in general this seemed to be learning to enhance their own skills (practical skills such as hedge-laying and species identification). Several participants wrote or talked about seeing nature or wildlife, and visiting new places, but unlike the practitioners, these tended to be phrased as benefits for them as individuals, rather than benefits for the environment. The largest difference between practitioner and participant

responses related to the social aspects of participation; these seemed to be more important for the participants, supporting previous literature (e.g. Schusler et al. 2009). After sending a draft of this chapter to practitioners, some expressed surprise at the differences between the outcomes they felt were important and the benefits participants felt they gained from the projects. Many practitioners appeared to value the opportunity to reflect on their work more deeply than time usually permits.

Both practitioners and participants struggled to think of any negative outcomes of environmental education, despite prompting, supporting previous research that has highlighted the lack of discussion of negative outcomes (e.g. Rickinson et al. 2004, Hattie et al. 1997). I was struck by the almost unwavering positive attitudes of practitioners; any potentially negative experience was soon turned around into a positive learning experience. When negative outcomes were suggested, the content of them varied between practitioners and participants, with participants less concerned about bad weather and discomfort from insects, nettles etc. than practitioners thought they would be. For both practitioners and participants, the negative outcomes most frequently mentioned were effects on the environment, for example, trampling through over-use of sites. The discrepancies between some of the outcomes (both positive and negative) as perceived by practitioners and participants highlights the need for them to spend more time discussing their goals together.

CHAPTER 3: UNDERSTANDING ENVIRONMENTAL EDUCATORS' EVALUATION PRACTICE

3.1 INTRODUCTION

There are two main types of evaluation: formative which is carried out during the lifetime of the project with the aim of improving it, and summative, which is conducted at the end in order to assess the success of the project (Shadish et al. 2001). Over recent decades, there has been a shift in the methodologies used for evaluation. Evaluation of environmental education projects on a large scale began in the United States in the 1960s for projects that were funded by the Department of Education. These evaluations emerged from the era of positivism, and thus methods such as randomised control trials became considered as optimal (Fleming and Easton 2010), as they were thought to be able to provide true knowledge about programmes through assessment of inputs, outputs and the relationships between them. These early evaluations aimed to establish which programmes worked best in order to provide advice for future reform and funding (House 2005).

However, such evaluations were critiqued for being very costly and often inconclusive, due to the complexities of assigning causation (House 2005). In addition, their findings were often not used by practitioners (Shadish et al. 2001). Thus, there has been a shift towards a more diverse range of methodologies including qualitative approaches (House 2005), with evaluations being designed to take greater account of the needs of the end users (Patton 2002). Additionally, there has been a decentralisation of power in evaluation, with staff members evaluating their own projects rather than using external evaluators (Easton 1997, Greene 2010). This can be advantageous as staff know the project and its objectives well, and may be more likely to put the findings into practice than if external evaluators are used (Easton 1997). A recent study (Fleming 2009) investigating professional development needs of environmental educators found that many saw evaluation as something they should do as practitioners, in order to improve their projects. However, project evaluation requires specific skills and methodologies that practitioners do not necessarily possess, and they may therefore require additional training and guidance. Easton (1997) suggests setting up a network of education practitioners who are responsible for project evaluation so that they can share resources and ideas. This would help organisations learn from each other, as currently evaluation is developed on a project by project basis (Ellis and Gregory 2008).

As evaluation can take many forms, the Kirkpatrick evaluation taxonomy may be useful for framing different evaluation methods. It categorises evaluation into one of four levels; Reaction, Learning, Behaviour and Results evaluation, with each level giving increasingly detailed information about the impact of programmes on participants (see Chapter 1 Figure 2). Reaction evaluation, the most basic form of evaluation, is that which looks at participants' initial responses to participation. Learning evaluation assesses changes in understanding or awareness, and behaviour evaluation considers whether people modify what they do after participation. Results evaluation tracks whether or not longer-term outcomes occur as a result of the activity. Each level gives greater depth of knowledge about the programme being evaluated, and is therefore more time consuming to collect (Kirkpatrick 1996, RCUK 2005).

The large range of outcomes identified by practitioners and participants, discussed in Chapter 2, would require all four levels of evaluation in the Kirkpatrick model. For example, increased knowledge, which appears to be most important for environmental educators, can be evaluated through learning evaluation. Improved behaviours clearly requires behavioural evaluation. Enjoyment and fun can be measured through reaction evaluation, and outcomes such as improving community cohesion and involvement of marginalised people need longer-term results evaluation. This Chapter considers which types of evaluation actually occur as part of environmental education programmes, as very little is known about how evaluation is practiced, who is conducting evaluations and why (Henry and Mark 2003).

It has been noted by several researchers (Rickinson et al. 2004, Fleming and Easton 2010, Carleton-Hug and Hug 2010) that there is a lack of good quality evaluations reported in the environmental education literature. It should be noted, however, that the majority of evaluation reports do not get published in the academic literature (Monroe 2010). A review of three environmental education journals (Environmental Education Research, Journal of Environmental Education and Applied Environmental Education and Communication) found just 30 articles reporting on programme evaluation over the period 1994-2008, and the authors concluded from this, and their experiences of working with environmental educators, that the majority of programmes do not include systematic evaluation into the planning of their projects (Carleton-Hug and Hug 2010). Fien and colleagues found a lack of project evaluation in their study of WWF (Fien et al. 2002), and Fien et al. (2001) suggest that the problem is not that evaluations go unreported in the literature, but that they are not taking place as there is a lack of a culture of evaluation within environmental education. This may also be the case more widely; Norland (2005) reports that evaluation is often not well integrated into non-formal education programmes,

where there are often no curricula against which to assess participants (Ballantyne et al. 2005), making programmes hard to evaluate, at least in terms of learning.

Difficulties such as lack of clear curricula, coupled with some evidence of institutional resistance to evaluation (Carleton-Hug and Hug 2010) may have led to an absence of tools available to practitioners to evaluate their projects, with many projects focusing simply on trying to detect an increase in knowledge after the project (Fien et al. 2001). Within the environmental education literature, pre- and post- project questionnaires seem to be the most commonly used mechanism for detecting changes in knowledge (Carleton-Hug and Hug 2010). This evaluation method would be categorised as learning evaluation in the Kirkpatrick model. Examples of this methodology include Bogner (1999) using questionnaires before and after a programme about swift ecology, and a similar study involving inter-generational knowledge transfer about macaws (Vaughan et al. 2003). Both these studies attempted to assess longer-term impacts (results evaluation) although on short timescales of less than 3 months. Pre- and post- intervention questionnaires are also used to evaluate any changes in attitude and behaviour.

Less commonly, environmental education researchers use other methods for evaluating projects, for examples see Storksdieck et al. (2005) where personal meaning maps were used to assess visitors' perceptions of biodiversity before and after visiting a WWF exhibition, and Taff et al. (2007) for a description of the mixed-methods used to assess short and longer-term benefits of participation in an Outdoor Education Camp. Others have championed the use of Significant Life Experience (SLE) research methods to understand the long-term impacts of environmental education (e.g. Chawla 1998, Palmer 1999), but longitudinal studies are often not feasible or practical for environmental education researchers or practitioners to carry out. For example, participant contact details may not have been kept, there may be insufficient resources to follow-up activities, participants may have moved addresses, or they may not remember specific details of the project. Many environmental educators are delivering low-budget projects with an even smaller (or non-existent) budget for evaluation (Norland 2005), which in general tends to suffer from limited funding (Bamberger et al. 2004). Often, the expectation put on evaluation by funders is not matched by the resources available to conduct it (Ellis and Gregory 2008). Thus, the published literature on evaluation studies remains dominated by questionnaire-based research in the realms of reaction and learning evaluation. It is important to note the distinction, however, between published research where environmental education projects have been evaluated and evaluations that have been conducted by practitioners. Little is known about the evaluation practice of environmental educators, or indeed practitioners of any discipline (Whitehall et al. 2012).

In this Chapter, I use findings from the questionnaires and focus groups to explore the evaluation practice of environmental educators. My research seeks to discover why they evaluate, the range of tools used for evaluation and how frequently they are used. The Kirkpatrick evaluation typology will be used to discuss the types of evaluation that these practitioners conduct, and was chosen because it offers a way of categorising evaluation methods in terms of the depth of the results they provide and the amount of time it takes to conduct the evaluation. The outcomes of environmental education that are considered important by environmental educators, as discussed in Chapter 2, will be compared with the tools that practitioners use to evaluate them. The research questions covered in this Chapter and methods used to answer them are shown in Figure 17.

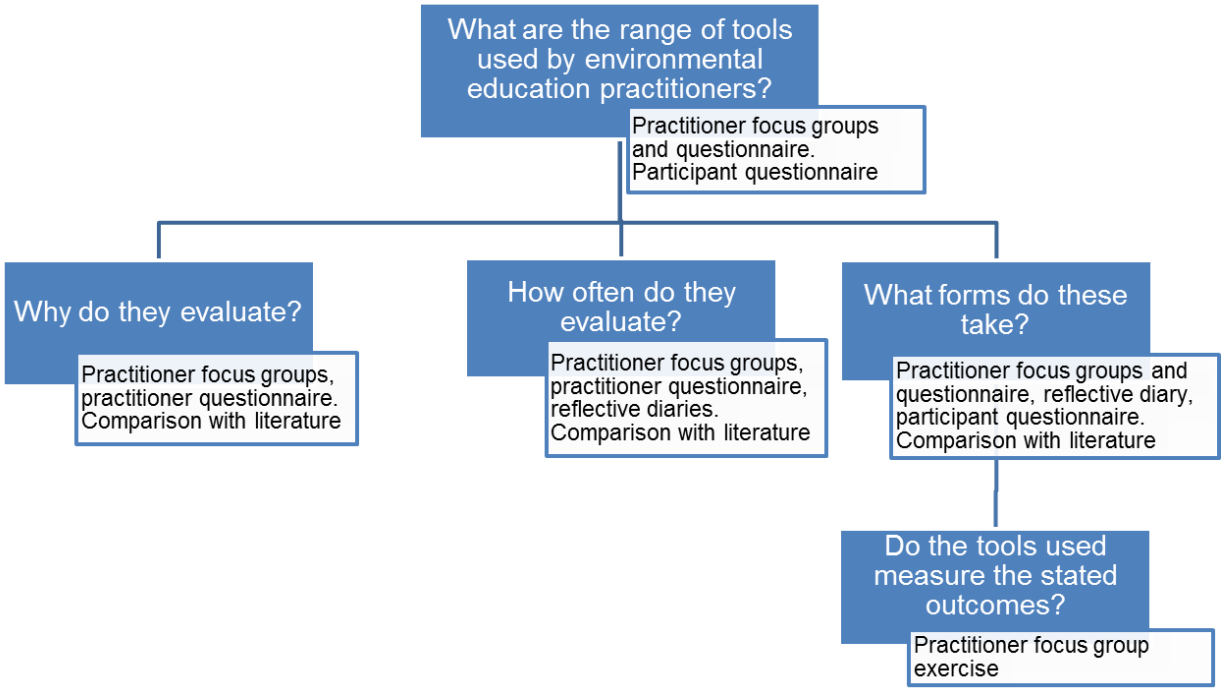

Figure 17 Questions to be answered in this Chapter (blue boxes) and the methods used to answer them (white boxes).

3.2 METHODOLOGY

I used a mixed-methods action research approach, working closely with environmental educators to try to understand their evaluation practice. Several methods of data collection were used including a questionnaire and focus groups with practitioners and a solicited reflective diary for practitioners. Participant questionnaires (see Chapter 2 for details) were conducted to gain insight into the views of participants towards evaluation.

As described in Chapter 2, the practitioner questionnaire was completed by environmental educators from across the UK. The latter half (questions 7-12) was designed to assess the methods used for project evaluation (see Table 9 and the full questionnaire in Appendix 1).

Table 9 The format of the practitioner questionnaire, showing the questions relevant to evaluation practice, their response types and whether there was space for respondents to write free text.

Question	Response type	Free text "Other" box?
7. How important is evaluation in your work. Why is this?	Multiple choice	Yes
8. How often do you evaluate your projects	Multiple choice	Yes
9. Who carries out evaluations of your projects	Multiple choice	Yes
10. If you currently evaluate your projects, what form does this take	Multiple choice	Yes
11. What methods or tools have you used for evaluating your projects	Open	N/A
12. If you don't usually evaluate your projects, what would encourage you to do so	Open	N/A

Sixteen questionnaire respondents also attended focus groups, which gave an opportunity to discuss evaluation methods in more detail (Table 10). Practitioners were all asked to bring tools that they used or knew of to the focus group, and during the focus group I asked them to look at the tools and compare them to the list of outcomes that had been generated through the questionnaire and previous focus groups (see Chapter 2 Table 6 for this list). This allowed me to create a matrix comparing all the tools contributed by practitioners against the outcomes that they felt they measured.

Table 10 The sections of the focus groups relevant to evaluation methods. The full focus group structure can be seen in Chapter 2.

Introductions	Practitioners introduce themselves and any tools they brought with them
Paired discussion / "Matrix" exercise	In pairs (if enough participants), practitioners discuss the tools they use and match them to the list of outcomes
Summary to group	If time and interest allows, pairs feedback their discussion points to the group

After the focus groups, I compiled all the tools which had been contributed by practitioners and discussed in the groups into an evaluation folder. I then sent these to all the focus group practitioners, along with copies of an A4 sheet of paper entitled "Reflection on the tools" (hereafter referred to as reflective diary). The diary was designed to be completed each time practitioners used an evaluation method from the folder, and sent back to me in a freepost envelope. Electronic versions of the tools and diary were also provided. The reflective diary asked practitioners to respond to eight questions (see Table 11 and the reflection document in Appendix 4). All questions were followed by space for practitioners to write as much as they wished. The first four were short answer questions about the

date of the activity, the type of group they had worked with and the type of evaluation method used, and the last four questions were designed to encourage the practitioners to think more deeply about the evaluation results.

Table 11 Questions in the reflection document. All questions had free-text responses.

Question	Notes
Date(s)	
Group worked with (e.g. name of group, ages, number)	
Have you worked with this group before? Y/N. If so, how often do you work with them?	In order to identify whether the participants were one-off or regular.
Name of tool used / type of evaluation carried out	
How long did the evaluation process take?	
Was the tool / evaluation easy to use?	
How could it be improved?	The sheet also said "If you wish, make comments on the tool and attach it to this sheet"
How will the results from the evaluation impact your work? What changes, if any, will you make to your work based on this feedback?	
Any other comments	

In order to gain an understanding of what evaluation methods participants in environmental education projects felt that they had experienced, the participant questionnaire (see Chapter 2 for full details) included Question 6: "When taking part in environmental projects, what types of evaluation or feedback, if any, does your group leader ask you for? (for example, paper forms, comments at the end of the day)". The wording of this question differed from the practitioner questionnaire in two ways. The word feedback was included as this was frequently used by practitioners in their questionnaire responses and focus group discussions. The examples of paper forms and comments were given as these were also frequently mentioned by practitioners.

3.3 ANALYSIS

The practitioner questionnaire responses were imported into Atlas.ti (version 6.1) along with the focus group transcriptions for analysis. As described in Chapter 2, codes were assigned using a grounded theory approach, i.e. the codes came out of the data during analysis, rather than assigning comments to predetermined categories (Corbin and Strauss 2008). Quotations associated with the code family 'Range of tools' and code 'Rationales for evaluation' were used in this chapter (see Appendix 5 for the full list of codes used). These codes were exported from Atlas, printed out and then categorised by hand into sub-codes. The frequencies with which these sub-codes appeared were then calculated to give an indication of the importance of them to practitioners. As participant

responses were shorter, they were not imported into Atlas but they were hand coded into sub-codes in the same way as the practitioner data had been.

3.4 FINDINGS

3.4.1 Rationale for evaluation

The majority of the 42 practitioners responding to the questionnaire felt that evaluation was either “Very important” (24) or “Fairly important” (16) in their work. One practitioner felt it was “Neither important nor unimportant” and in the free text box wrote “*We don't have any formal programme and just offer ad hoc opportunities when someone asks us”.* Only one practitioner selected “Not very important” and qualified their response with *“Difficult to carry out any evaluation at public events. But we do keep a record of how many people are present at our events. When we run geology seminars we ask for the usual sort of evaluation form at the end of the day.”* Practitioners gave a wide variety of reasons for their responses to this question (Table 12). Improving quality was the most frequently given rationale, and this was also often discussed in the focus groups, although it should be noted that here practitioners were not directly asked about their rationales for evaluating projects. However, practitioners frequently talked about the reasons why they evaluate, both in their paired and wider group discussions.

There was broad agreement between practitioner questionnaire responses and the frequency with which different rationales were discussed in the focus groups, but Table 12 does show some obvious differences. In general, the discussions in the focus groups seemed to suggest that the rationales were more utilitarian than the rationales mentioned in the questionnaire responses. For example, a rationale that was mentioned fairly frequently in the questionnaire responses was to see if projects meet the needs of participants, but this was not raised at all in the focus groups, with more discussion around reporting to funders and securing future funding. A disadvantage of using focus groups is that they can allow certain themes to dominate at the expense of others (Meth 2003), and this may have occurred here.

Table 12 Number of times each rationale for evaluation was mentioned in free text responses to Question 7 of the practitioner questionnaire (second column) and in the focus groups (third column).

Rationale	Frequency mentioned in questionnaire	Frequency mentioned in focus group
Improve quality	14	15
Report to funders	8	12
See if work meets needs of participants	8	
See if achieving project goals	6	4
Secure future funding	4	7
Ensure return business	3	3
Assess what the benefits are	3	
See changes in participants over time	3	2
Informing practice	2	1
Provide personal feedback	2	
Help identify objectives and plan outcomes	2	
Prove impact of work	1	3
Make participants aware of their learning process	1	
Gather ideas for future projects	1	
To gain positive comments	1	4
Decide which activities have most impact on participants	1	
Highlight problems		2
As research project		2
To demonstrate professionalism		1
Report to quality badge assessors		1

The prominence of discussion around funding indicates that these practitioners are well aware that "we live in an age in which environmental educators are increasingly being challenged by their funders and their audiences to demonstrate their results" (Thompson and Hoffman 2003 p 5). For example, Ruth showed me one of her evaluation folders and said *"it also gets used when we have to do really exciting consultation documents that we have to give consultants, because of the current economic circumstances, due to Mr Clegg and lovely Mr Cameron, at the moment we're having funding questioned and stuff, so again this is all part of [that]. It actually quite frustrates me that centres don't recognise the importance of things like this. This is really important information. If you don't make the effort to gather it off the people that are using you, when somebody turns round and says 'we're going to cut your budget by 80,000 pounds' you can't then turn around and go 'yeah, but, look and we can prove it'… we've got all of the numbers that say 'well, look, this is how it is valued'."*

The most frequently mentioned rationale was to improve the quality of the work. Some of the quotations associated with evaluation being important to improve work were; *"Feedback from the school's staff is very important at our centre and courses and days provided are altered to fit this on the return of those schools…it is important to keep the teaching to the highest quality and be aiming to use evaluation to continue improvements"* (questionnaire respondent), and *"I always seek to improve what I do and knowing what participants feel about what I've done, what can be improved and what is and isn't best appreciated helps me to achieve this (also helps me to get more work!)" (*questionnaire respondent). This last quotation highlights another comment that was made by several other practitioners, that evaluation is necessary to ensure return business. A comment that encompassed this point was *"we want people to enjoy what they do with us and want to come back - if it doesn't meet their needs then they won't want to visit us/join in our activities/support us"* (questionnaire respondent). Emma felt that her evaluation forms were *"very much about improving service"*. She said *"And again it's 'comment on our provision', not 'what you have learnt', 'what you have appreciated', 'what you have done today'",* in a tone that suggested she'd rather be answering these questions instead.

The wide range of rationales in Table 12 indicates that practitioners believe there to be many potential benefits from conducting evaluation. Stokking et al. (1999) list four possible purposes of evaluation: 1) the need to report to a funder, 2) to provide participants and groups with information, 3) to monitor quality, and 4) to improve quality. A National STEM (Science, Technology, Engineering and Maths) Centre report offered an additional rationale for evaluation; to provide evidence to show that the project is having an effect (STEM 2009). These broad purposes encompass most of the rationales suggested by practitioners in my research, but several other reasons for evaluation were also given. For example, four focus group members said that they used evaluation as a way of obtaining quotations from people to use in publicity or to give themselves an ego boost if participants tick all the positive boxes. The problem with this is that, as Roger said during the focus group discussion about tools, *"what you may end up with is a big long row of 5s saying everything has gone really well and you get that nice warm feeling, and you get a few 1s down the other side and you know people didn't like it very much but you haven't actually captured what you can do to change it. That is the criticism of a number of these, somebody has ranked them and they've ranked it low and you don't know why. So you haven't actually achieved anything, other than to realise someone had dissatisfaction in your group"*. Roger is self-employed and currently only uses evaluation forms provided by the organisations he works with. Many practitioners highlighted the value of having a free text area on forms to capture comments from participants about different aspects of the activity.

3.4.2 Who evaluates?

The questionnaire asked practitioners who carries out evaluations of projects. Five responses were possible (Figure 18) and the majority reported that they or someone else in their organisation conducted the evaluation, with just four out of 42 practitioners indicating that external organisations evaluate their work. Of the 19 respondents who ticked “Other”, nine wrote that their participants carried out the evaluation, indicating that perhaps the question was unclear to them, one said that the funders evaluated their project and six said that multiple people within their organisation evaluated their projects. In addition, just over half of the respondents ticked more than one option, suggesting that within an organisation, a range of different people evaluate the projects. Easton (1997) reports that there has been a shift towards internalisation of evaluation, with staff conducting their own evaluation rather than using external evaluators, and this would appear to be supported by these findings. In addition, although several focus group practitioners mentioned having had students in to conduct evaluations, these tended to be one-off projects as part of university studies.

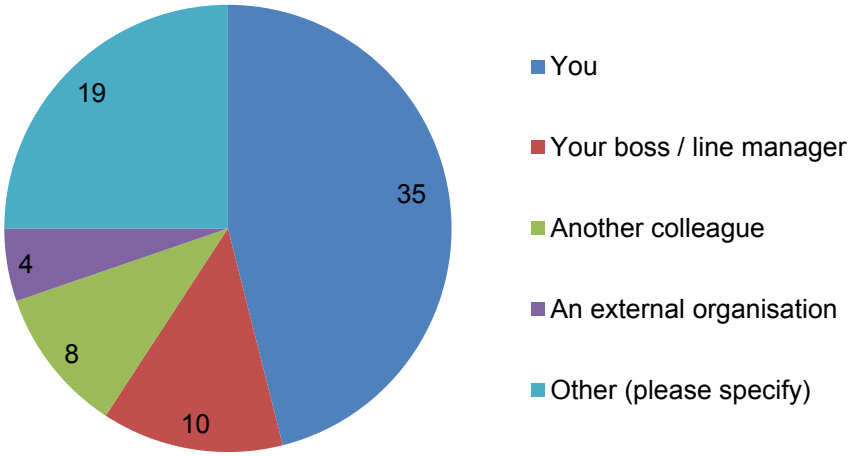

Figure 18 Responses to “Who carries out evaluations of your projects?” in the practitioner questionnaire. Five responses were possible, including “Other”, and respondents could tick as many answers as they wished. The numbers on the chart indicate the number of respondents who chose that response.

3.4.3 Frequency of evaluation

The questionnaire asked practitioners “How often do you evaluate your projects?” and the responses indicate that the majority evaluate their projects on at least a weekly basis

(Figure 19). Although the frequency of evaluation varied from daily to less than once a year, none reported never evaluating their work. Six respondents ticked “Don’t know” but left comments indicating that they evaluated sessions regularly but that the frequency of sessions varied.

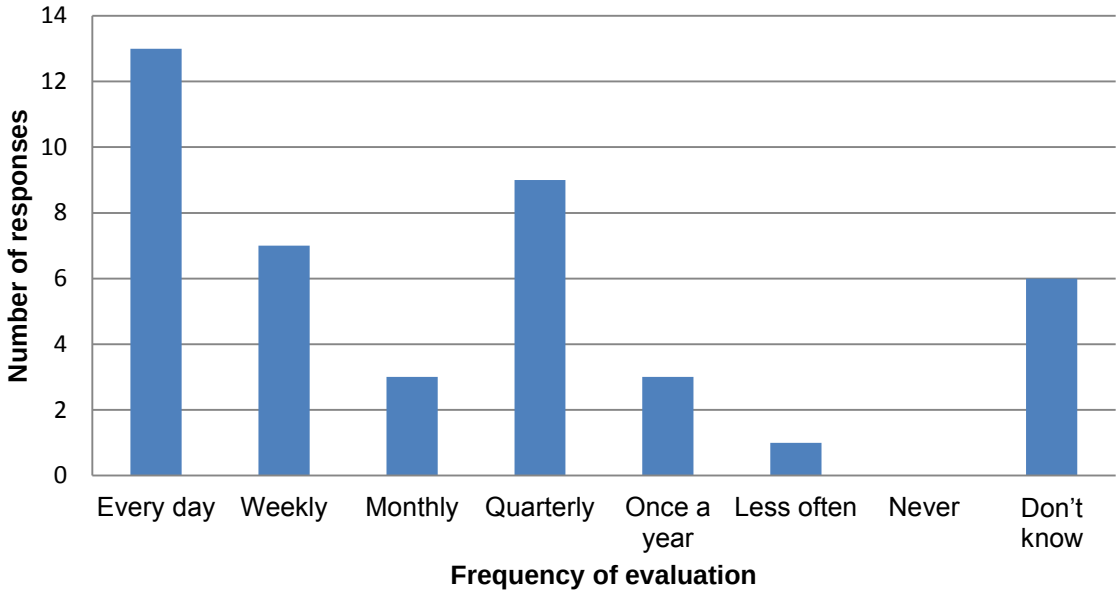

Figure 19 The frequency of evaluation carried out by environmental education practitioners, based on responses to Question 8 of the practitioner questionnaire.

Similar results were found in the focus groups (Table 13) with the majority of practitioners reporting that they evaluated after all or most sessions. For example, Kevin said *“evaluation, particularly of school visits, is de rigueur really”*, and Ruth said *“of course we’ve got evaluation forms for every single different activity that we run”*. Others evaluated only the formal education aspects of their work; *“We only assess our teaching training and our schools visits. We also do public events, bat nights, things like that, and we don’t take feedback, I’m wondering if I should”* (Katherine).

Table 13 The frequency with which environmental educators taking part in the focus group evaluate their projects. This information was gathered when practitioners first introduced themselves in the focus groups.

Frequency of evaluation	Number of practitioners
Every day / after each session	10
After most sessions	7
Occasional	5
Very little	2
None	3
Once a year	1

Only three focus group practitioners said they conduct no evaluation at all, and they all wished to start evaluating; for example *"we don't evaluate our projects at the moment…we're looking at developing a way of evaluating, because obviously we've got grants for developing our facilities and we're now needing to evaluate"* (Leilah). Most practitioners said they needed to carry out more evaluation, but a small number were content with only conducting occasional evaluations, feeling that they'd rather spend the time elsewhere, for example, Heather said *"I'd rather have them out there doing something rather than sitting in a room talking about it"*.

Despite the many benefits of conducting evaluation, several researchers (e.g. Hattie et al. 1997, Rickinson 2001, Rickinson et al. 2004, Carleton-Hug and Hug 2010) have reported that practitioners frequently do not include evaluation measures when they plan and execute their projects. Research within conservation education has also shown that there is little ongoing assessment or evaluation built into programmes and consequently few published reports about evaluation (Jacobson and McDuff 1997). A review of 37 audits conducted on conservation projects found that less than a third had any formal systems for monitoring or evaluating programmes and feeding the results back into practice. In general, these projects did not even keep notes about what worked and what didn't work (O'Neill 2007). At first glance, the frequency data from the questionnaire and focus groups suggest that perhaps more evaluation is being carried out than Carleton-Hug and Hug (2010) and others have reported. It is important, however, to take into account the *types* of evaluation that practitioners conduct, as there seems to be a difference between what practitioners perceive as evaluation, and what academics and evaluators consider evaluation to be. For example, several of the practitioners expressed that *"the repeat visit speaks volumes"* and felt this was sufficient evaluation. This was a view shared by one of the participants who responded to the questionnaire with "*The best evaluation is if the people come in [sic] the activity again".* Clearly, however, the repeat visit could be due to the venue being cheap, conveniently located, or many other reasons. This "evaluation" is a far cry from any of the evaluation methods used by professional evaluators or researchers, and the types of evaluation actually conducted by practitioners will be considered next.

3.4.4 Forms of evaluation

Practitioners reported using a wide range of evaluation methods (Table 14). In total, 21 different evaluation methods were mentioned in the questionnaire responses, with a further six discussed in the focus groups. Most practitioners reported using multiple evaluation methods, for example "*We use up to 10 different methods depending on the*

aims of the specific service we are delivering with." and "*Feedback questionnaires Post it boards Quantitative data reflective feedback - verbal and written"* (questionnaire respondents).

Despite this diversity, by far the most frequently mentioned evaluation methods were questionnaires and feedback forms, and these also dominated the tools brought by practitioners to the focus groups. Questionnaires were used with a large range of ages, with one practitioner even asking children aged seven and under to complete a questionnaire as a group with their teacher. This included a tally to show which activity the pupils most preferred, and space for suggested improvements. The popularity of questionnaires is also reflected in the environmental education literature, with published evaluations mainly using questionnaires, often in a pre- and post- intervention design (Rickinson 2001, Carleton-Hug and Hug 2010). None of the practitioners in my sample mentioned using questionnaires in this way. From museum literature, another non-formal education environment, Hein (1998) reports that, for many practitioners, 'evaluation' is synonymous with 'survey' or 'questionnaire', with practitioners often asking visitors the questions and completing the questionnaire for them. A problem with questionnaires is that those who most enjoyed the event are most likely to complete them, followed by those who actively disliked the event, whilst those who were indifferent are least likely to complete them (RCUK 2005, Ellis and Gregory 2008). Clearly, this introduces bias into the sample, but this point was not raised by any of the practitioners in the focus groups.

Table 14 Evaluation methodologies used by practitioners. The first column indicates the type of evaluation methodology, the second indicates the number of times it was mentioned in the questionnaire responses (questions 10 and 11), and the third column shows the number of times discussion was had about that methodology in the focus groups.

Type of evaluation	Frequency mentioned in questionnaire	Frequency mentioned in focus groups
Questionnaires / Feedback forms	36	22
Discussions / Verbal feedback	18	16
Drawings / reflective books	10	4
Games	8	18
Letters / drawings after the activity sent to practitioners	6	9
Happy/Sad faces	4	2
Practitioner reflecting after session	4	7
Interviews (face-to-face or over telephone)	3	1
Comments board / post-it notes	3	8
Photographs of the activity	3	4
Counting numbers of participants	2	3
Diagrammatic evaluation sheets	2	1
Online surveys	2	
Drama/Music/Film	2	
Checklists	1	1
Practitioner reflecting during session	1	8
Focus groups	1	1
Written evaluation from colleagues	1	
Word selection	1	1
Anecdotal information	1	
Group reflection at start of session	1	
Observation		8
Group of practitioners reflecting after session		3
Peer to peer observation		3
Evaluation day with group leaders		1
Postcard (very short questionnaire)		1
Formal Assessment / test		1

Discussion with participants and verbal feedback were frequently mentioned by both sets of practitioners. These methods could be considered as an informal, more practical, version of focus groups or interviews (RCUK 2005), although several practitioners in my sample reported that these discussions are not formally documented. Instead, practitioners tended to use them to gain an impression of how well the session went and if

participants had any major concerns.

Using games as evaluation was frequently mentioned in practitioner questionnaire responses and discussed in the focus groups. Examples of these included one where the practitioner places two cards on the floor, one with “I enjoyed it” and the other with “I didn’t enjoy it” written on them and the children have to run to stand on whichever card they feel most represents their view. The practitioner then takes a photograph of the position of the children and uses it to demonstrate enjoyment of the session to their funder. A similar evaluation game used by two practitioners involves the children jumping in the air or waving their arms around to show how much they enjoyed the activity. These were mainly used to quickly gain feedback from young children whilst getting them active and warmed up during outdoor sessions! Presumably peer pressure would bias these simple methods but only one practitioner mentioned this. Such games were used regularly by these practitioners, who in some cases saw them as a supplementary form of evaluation, whilst for others this was the only evaluation they reported. In the Kirkpatrick typology evaluation games would be classed as reaction evaluation, as it gives an instant response about levels of enjoyment. The RCUK guidelines warn that this kind of evaluation can become a simple assessment of whether or not people enjoyed an activity (RCUK 2005). This does seem to be the case for these practitioners, with many of the evaluations designed to assess enjoyment and to provide good photographs for funders. Mick highlighted one of the problems with solely conducting reaction evaluation “*I think you’ve got to be really bad for people to give you low scores...when they come out they always enjoy it, regardless*.”

Letters, drawings and comments boards were fairly commonly used by focus group practitioners, with some practitioners saying that the quotes they received from participants through these means are used in publicity materials. As several practitioners pointed out, these tend to only generated positive comments and some practitioners use them “*to see which activities were most popular with the kids”* (Graham). However, there is the potential for them to be used as an indication of issues which should be explored in more depth (RCUK 2005), although none of the practitioners mentioned using them in this way.

The findings from the participant questionnaire supports the high use of discussion and verbal feedback (Table 15), with one participant writing “*Comments on the quality of the walk and how much it has been enjoyed”.*

Table 15 Forms of evaluation participants listed in response to Question 6 of the questionnaire.

Type of evaluation used	Frequency mentioned
Discussions / Verbal feedback	20
Questionnaires / Feedback forms	10
Counting numbers of participants	3
Quiz	3
Species lists	2
Drama/Music/Film/Photographs	1
Anecdotal information	1
Games /active evaluation	1

Only one participant mentioned games, probably because the respondents were all of secondary school age or above. Overall, the list of evaluation methods generated by participants is much smaller than that from practitioners. This may be a reflection of the fact that practitioners run a large range of activities with a wide range of groups and ages, whereas individual participants may only take part in a limited number of activities. It may also be accounted for by the fact that participants were only drawn from four events.

The only form of evaluation which participants listed but practitioners did not was a quiz, which may indicate that practitioners see this as a form of assessment, rather than evaluation. In addition, one participant said that they were asked for a "*list of all wild life*" and another said "*Data of invertebrates"*, suggesting that they were confusing evaluation with other forms of data collection. There was also some evidence that other participants were confused between evaluation and monitoring. Three participants responded to Question 6 by listing monitoring activities, with one writing *"Sign in"*, another *"Personal number and name*" and a third "*Equal opportunity form*." Similarly, several of the practitioners in the focus groups described evaluation methods that were more akin to monitoring as they simply involved counting numbers of attendees, or taking photographs (see Table 6). A good example of this was the *"boring"* evaluation form that Hellen said she had to use; *"this is more for monitoring numbers bit…basically it's for numbers".* This form includes a section for reporting on "*customer satisfaction*" but Hellen said *"to be honest I very rarely do that on these, because I just find it a bit of a pain in the bum".* A charge commonly levelled at education evaluation is that it focuses on input and process indicators (for example, numbers of participants), rather than outcomes or outputs (Easton 1997), and that does seem to be the case for some of the evaluation reported by this sample of practitioners.

This confusion between evaluation, monitoring, and other forms of data collection raises an important issue; there are clear differences in understandings of terminology. Some of

the forms of evaluation mentioned by practitioners would not be considered evaluation by researchers or professional evaluators. A good example of this is *"Letters and pictures and thank you emails"* (Leilah) which Ruth thought were *"a way of pupils evaluating stuff, and we've also got frames and cabinets full of letters"* as well as being good for publicity purposes. It is likely, therefore, that some of the evaluation that practitioners say occurs on a regular basis is simply monitoring. Indeed, a study of monitoring and evaluation in the third sector in the UK found that many respondents to their questionnaire did not distinguish between monitoring and evaluation (Ellis and Gregory 2008).

3.4.4.1 Kirkpatrick classification

The RCUK Evaluation Guidelines state that all projects should include reaction evaluation; for a smaller number, learning evaluation will also be appropriate, and for very few projects, behaviour or results evaluation will be used, because of the increasing cost and complexity of these types (RCUK 2005). Reaction evaluation does appears to account for the majority of regular evaluation mentioned by practitioners in the questionnaire and focus groups, with a smaller number of practitioners reporting the use of more in-depth methodologies that can measure higher level outcomes. Such methodologies include interviews, focus groups and evaluation days with group leaders, and these are mentioned very infrequently compared to games, questionnaires and feedback forms.

The evaluation tools brought by practitioners to the focus groups are summarised in Table 16. Here, I categorised the tools according to the Kirkpatrick typology. It can be seen that the proportion of reaction evaluation relative to more detailed evaluation methodologies is high. There are no tools categorised as results evaluation.

Table 16 also gives examples of the types of questions asked by the tool. Some of the questions are quite unclear. For example, in just one question, tool M seeks to discover whether participants learnt anything, gained confidence and enjoyed themselves, by allowing them to choose one of five smiley faces.

Table 16 Evaluation tools brought by practitioners to the focus groups. Tools have been given letters to protect anonymity of the organisations involved. The second column shows the age range the tool is aimed at, whilst the third indicates whether it is designed for formal or non-formal settings. The fourth column shows my classification of the tool using the Kirkpatrick typology, and the last column gives an example of the text used in the tool.

Tool	Age range	Formal / non-formal	Kirkpatrick classification	Example question
A	Primary	Any	Reaction	In taking part have you: joined in? Felt good?...
B	Primary/Secondary	Formal	Reaction	How do you rate the programme in terms of: Achievement of learning objectives (Options: Outstanding. Very good. Good. Satisfactory. Inadequate.)
C	Any	Any	Reaction	[NB Ice Breaker to allow participants to reflect on what happened, through drawing a graph]
D	Secondary	Non-formal	Learning	What have you learnt about yourself during your project? Which personal goals have you achieved?
E	Any	Non-formal	Reaction	What have you enjoyed?
F	Adult	Any	Behaviour	Are you a member of a Natural History group…? If you answered No, would you be more likely to consider joining a local group? (Option: Yes/No)
G	Any	Non-formal	Reaction	I enjoyed the activity (Options: 3 smiley faces)
H	Any	Any	Behaviour	Physical activity: Willingness to take part, level of physical activity…(Options: 1-4 (poor-good).
I	Primary/Secondary	Non-formal	Behaviour	At project start, middle and end, circle a number from 1-5 to indicate e.g. Confidence with peers, Communication skills, Self esteem.
J	Adult	Non-formal	Reaction	Did you learn anything new during the activity? (Options: Yes, a lot. Yes, a little. No, nothing. Don't know)
K	Secondary/Adult	Any	Learning	In taking part have you: Skilled up? Learned how to….. (Options: 0-4 (No not at all-Yes, definitely))
L	Adult	Non-formal	Reaction	Did you enjoy yourself today? (Options: 5 smiley faces)
M	Adult	Non-formal	Reaction	Do you think your family both enjoyed themselves today and increased their knowledge and confidence while using the countryside? (Options: 5 smiley faces)
N	Primary	Formal	Reaction	Draw a picture of the activity you enjoyed the most
O	Adult	Non-formal	Reaction	Circle a number out of 5 to show much you enjoyed the day
P	Primary/Secondary	Any	Reaction	Which part of the session(s) did you find most useful?
Q	Any	Any	Reaction	[NB. Ice Breaker game to allow participants to reflect on what happened, draw out key points etc.]
R	Adult	Non-formal	Reaction	Which parts of the course were most useful? (Free text response)
S	Primary/Secondary	Formal	Reaction	Relevance to curriculum (Options: Spot on! Great. OK. Could have been better. Rubbish!)
T	Primary/Secondary	Formal	Reaction	Have the Learning Objectives been met? (Options: No. Partially. Yes).
U	Any	Any	Behaviour	Comments/observations of child/adult: Healthy eating. Physical Activity. Emotional Well Being. Practical Skills
V	Primary	Non-formal	Reaction	Did you have fun today? Have you learnt anything new today? (Options: 5 smiley faces)

Continued overleaf…

Tool	Age range	Formal / non-formal	Kirkpatrick classification	Example question
X	Primary	Formal	Reaction	Make a list of all the things you did while you were here. How many thought it was the best?
Y	Primary/Secondary	Any	Reaction	What was the most enjoyable part of the project?
Z	Primary/Secondary	Any	Reaction	[NB. A self-reflection form for the tutor to complete] Did the students respond positively to the questions and engage with the tutor?
AA	Any	Formal	Reaction	Do you consider your visit to be good value for money? Where did you first hear about us?
AB	Secondary	Formal	Learning	[NB: A self-reflection form for the tutor to complete] The learner can explain why achieving this goal is important (tick box).

3.4.5 Do the tools and outcomes match?

In the focus groups, practitioners completed an exercise in which they examined evaluation tools brought to the focus groups to see which outcomes they were capable of measuring. Tools ranged from an A6 size postcard with four short and simple questions on it (tool J), and ones which were considered to be quite vague e.g. "*doesn't say really what activities they have enjoyed and what activities they would like to do more of and what they wouldn't like to do again"* (Chris, describing tool I), to ones which were "*far too long"* (Graham, describing tool F) and that *"you'd have to have a whole session to explain it in the first place"* (Jonathan, describing tool K). The results of this exercise give an indication of which outcomes practitioners think they are actually measuring in their evaluations. Table 17 shows the matrix of the tools that the practitioners were assessing against the coded outcomes. The number of outcomes that practitioners thought tools could measure ranged from 12 to one.

Fun, skills and increasing knowledge were the outcomes that the largest numbers of tools were able to measure according to practitioners. That fun featured highly is unsurprising as whether people enjoyed themselves or not is the simplest form of evaluation in the Kirkpatrick typology, reaction evaluation. Conducting the longer-term results, behavioural and learning evaluation, however, is more complicated (Kirkpatrick 1996, RCUK 2005). Thus, it is surprising that tools to measure whether participants gained new skills or knowledge featured highly in the matrix exercise. However, this may be due to a mismatch between what practitioners felt the tools could measure and what they actually did. For example, many of the tools asked whether participants felt they had gained new skills, often with a simple Yes/No response, sometimes with space for comments. Similarly, practitioners felt that increased knowledge of participants (both of the environment in general, and of humanity's impacts on the environment) was often measured, but this was not through a test of knowledge, rather by participants ticking to show whether they felt their knowledge had increased or not. A good example of this was the question "Today's activities have changed how I think about the environment" with Yes/No/Don't know response options. In addition to this being a very simple question, practitioners felt this was *"a leading question"* (Graham) as it was *"leading them towards a positive"* (Jonathan). Leilah pointed out that *"It could have changed them, they could decide they never want to go out again!"*

Table 17 Matrix created by focus group practitioners of the outcomes (first column) that they think particular tools (first row) measure. The last column gives the total number of tools felt to measure a particular outcome, and the last row shows the total number of outcomes that tool was felt to measure.

Outcome	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	**Number of tools measuring outcome**
Appreciation of nature	■		■	■			■										■												5
Knowledge of human impacts on environment	■	■	■		■	■	■			■	■	■	■				■		■	■									13
Care for the environment																													0
Improved behaviour towards the environment	■	■				■					■	■	■																6
Improving the environment		■																											1
Knowledge about the environment	■	■	■		■	■	■	■	■	■		■	■				■		■	■									14
Respect for nature	■	■				■					■						■												5
Awe and wonder		■	■											■															3
Being outdoors																													0
Career in environment	■	■																■											3
Connection to place																													0
Creativity, imagination, spirituality			■	■							■																		3
Freedom																													0
Friendship	■		■	■										■															4
Fun	■	■	■	■	■	■	■			■		■	■	■	■	■						■		■	■				16
Health	■		■	■	■			■			■				■						■								8
Personal development	■		■	■				■	■		■	■	■															■	9
Raising aspirations		■			■				■						■								■						5
Reducing fears					■									■															2

Continued overleaf…

Outcome	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	**Number of tools measuring outcome**
Skills	■		■	■	■		■	■	■	■		■	■	■	■	■		■	■		■	■							17
Social skills	■	■		■		■		■	■							■		■								■			9
Community cohesion				■		■	■			■		■	■																6
Meeting curriculum		■														■				■			■	■	■		■		7
Number of outcomes measured	12	10	10	9	7	7	6	5	5	5	5	5	5	5	4	4	4	3	3	3	2	2	2	2	2	1	1	1	

Thus, although some of the tools listed in Table 17 appear to measure a large range of different outcomes, this may be a misinterpretation by practitioners. Many of the tools featured a space for comments and some practitioners felt this meant that the tools had the potential to measure many outcomes, for example, one practitioner wrote during the matrix exercise *"This form has free space for comments which may pick up on making the environment better, improved attitudes and improved behaviours."* There may also be an issue of practitioners assuming that certain outcomes would be met through participation, an example of this is Emma saying *"If they enjoyed it, enjoyment is mental health"* as she ticked that the tool she was discussing was able to measure health benefits. Therefore, this exercise may have said more about the assumptions that practitioners hold than the actual outcomes that the tools measure. My assessment of the outcomes that these tools measure (Table 16) is more conservative.

There were few tools capable of measuring outcomes such as community cohesion. Several of the six tools that practitioners thought were able to measure this simply asked for a postcode so practitioners *"Could estimate involvement of marginalised groups through postcode"*, but as Cath said "*but you won't know whether they've actually cohesed will you*". This is an example of a results outcome, which is harder to measure, and few practitioners felt that they were able to assess these outcomes using their tools. According to my interpretation of the tools, none of them could be described as results evaluation (Table 16).

When the information from the matrix exercise is compared to the outcomes that practitioners ticked as being in their top five (see Chapter 2 for details) as in Table 18, it can be seen that there is not there is not a particularly good match between the number of practitioners selecting outcomes and the number of tools measuring those outcomes. Most noticeably, practitioners felt many tools were able to measure skills and increased knowledge of human impacts on the environment, but these did not feature strongly in the ranking exercise or practitioner responses to the questionnaire. Roger felt that some of the evaluation forms his employer wanted him to use "*didn't answer what I wanted to actually improve things"* and Kristel said "*Community cohesion, that's obviously the big number one at the moment, and I doubt there are any tools out there that really measure that*".

Many of the tools that people used on a regular basis measured very few outcomes. During the matrix exercise, some of the practitioners expressed surprise that the tools they use regularly didn't measure as much as they thought they did, or didn't match the outcomes they were most interested in. This indicates that perhaps they had not had time

to think about their evaluation tools, or evaluation in general, in much detail before. In addition, during the matrix exercise, several practitioners said that their forms were more geared to monitoring numbers of participants and collecting demographic data. Some practitioners worked for organisations who provided them with tools that they had to use and were not permitted to modify.

During discussions about the tools, several practitioners made comments suggesting that sometimes evaluation becomes just a paper exercise, with the results not actually getting used. In some cases, evaluations were conducted but the results were not available for practitioners to look at until the end of the year, or at all. For example, Roger finds the evaluation process used by the universities he works with *"incredibly frustrating"* because they *"never tell you how well you've done, all you get is invited back the following year so you assume it was ok"*. Cath responded Roger's comment with *"doesn't it therefore tell you that they are just doing it as a paper exercise, and they are not actually looking at the results? Because I mean there is no point them doing it unless they are going to feed it back to you is there?"* John and Alison also indicated that they don't often see the feedback they get; *"yes, we have a comments card thing. I don't know what happens to it"* and "*Generally we don't see the evaluation forms, we pass them on, we encourage them to fill them in …sometimes they will send them direct to us, but the instructions at the bottom are, I think it's freepost, to Bradford Industrial Museum."* (John). John went on to say that he only sees evaluation forms if the participant was dissatisfied. Easton (1997) and Patton (2002) have expressed concerns about evaluations being conducted but the results not actually used, and this does seem to be the case for some of these practitioners.

Table 18 The outcomes that were ticked in practitioners top five during the focus group, and the number of tools that measure that outcome, according to practitioners completing the matrix exercise

	Outcome	**Frequency ticked in top 5**	**Number of tools measuring outcome**
Environment	Appreciation of nature	20	6
	Knowledge about the environment	18	16
	Improved behaviour towards the environment	8	6
	Respect for nature	8	5
	Knowledge of human impacts on environment	6	15
	Care for the environment	4	0
	Improving the environment	1	1
	Total	**48**	**49**
Individual	Fun	15	19
	Health	8	9
	Career in environment	7	3
	Social skills	6	10
	Creativity, imagination, spirituality	5	3
	Raising aspirations	5	7
	Awe and wonder	4	4
	Personal development	3	9
	Skills	3	19
	Being outdoors	1	0
	Connection to place	1	0
	Reducing fears	1	2
	Friendship	0	4
	Freedom	0	0
	Total	**59**	**85**
Community	Community cohesion	8	6
	Total	**8**	**6**
Institutional	Meeting curriculum	2	9
	Total	**2**	**9**

Several practitioners in the focus groups indicated that they had found attending to have been useful for thinking about the tools they use and their evaluation practice more generally. For example, Katherine said that she was going to use some of the ideas gained in the focus group to evaluate public open days as she previously only evaluated her formal courses. The majority of practitioners took notes during the focus groups. These notes including things like details of questions they wanted to incorporate into their questionnaires and ideas for more active evaluation methods. Many practitioners had not

met each other before, despite some of them working within a few miles of each other. Janet said "*I don't think organisations talk often enough personally*". Emma felt it was "*very valuable that you are bringing together environmental educators within the region*" and was one of several practitioners who asked for a list of all the practitioners participating in the research "*so there is that network of the right people to talk to, and people that you can bounce ideas off in this area. Because you can get very corporatized…sometimes you need to refresh, you need to look at what other people are doing. It's not about nicking ideas, but looking at best practice*". This highlights the value of bringing practitioners together to discuss their work.

3.5 CONCLUSIONS

This Chapter aimed to explore the reasons why practitioners evaluate their projects, the frequency with which they evaluate and the methods that they use for evaluation. There was wide variety in the importance that these practitioners placed on evaluation; for the majority it was a key part of their activities, for others it was something that took place at the end of sessions if there was time, and for a minority it was only carried out very occasionally. The key rationales for conducting evaluation appeared to be to improve practice and to report to funders, but practitioners also suggested many other reasons.

The environmental education and evaluation literature suggests that many practitioners do not evaluate their work. At first glance, my sample would appear to contradict this, with the majority of practitioners reporting that they evaluate frequently. However, a more detailed examination of the tools practitioners use reveals that most of the evaluation regularly undertaken by these practitioners is simply an assessment of whether participants enjoyed the activity or not. In addition, some of this evaluation should be termed monitoring. The disparity between the literature reporting a lack of evaluation of environmental education projects and these practitioners reporting high levels of evaluation could be explained by differences in understandings of terminology. When researchers and evaluators publish evaluation reports, they mainly take the form of results and behaviour evaluation, and thus may not even consider the forms of evaluation at the base of the Kirkpatrick typology to be evaluations. However, the findings presented here demonstrate that the majority of regular evaluation conducted by practitioners is reaction evaluation, although some practitioners felt that their tools were able to assess longer-term outcomes. This may be because they are under pressure from their funders to evaluate such outcomes.

Heimlich (2010) states that satisfaction level measures (reaction evaluation) are important and must be conducted, but that higher level, longer-term outcomes also need consideration. These outcomes are not currently being assessed by practitioners in this sample, and it may be impractical for them to do so. Monroe et al. (2005) note that evaluations which assess long-term outcomes are virtually impossible for practitioners to conduct themselves. Only a few practitioners said that they did any evaluation after the event which suggests that they may indeed struggle with assessing longer-term outcomes. This issue will be considered further in Chapter 4.

Greater communication is also needed between practitioners, as during and after the focus groups, many practitioners expressed that they had found the discussions useful for discovering new methods for evaluating their projects. Since the focus groups, several reported that they have used new methods and encouraged other colleagues to do so too. This highlights the desire of many of these practitioners to improve their evaluation practice, and the need for increased opportunities for knowledge-sharing around evaluation for environmental education practitioners, as one questionnaire respondent put it, it *"always helps to look at new ways of doing things and learn from others' experiences."* Improving communication between practitioners and the research community and within practitioners themselves, however, will be challenging, due to the immense time pressures many environmental educators face; "*I'm lucky if I get five minutes at the end of the day, that's the problem*" (Heather*).

CHAPTER 4: BARRIERS TO EVALUATION

4.1 INTRODUCTION

Unsurprisingly, given the paucity of research into evaluation practice in general, little research has been conducted into the barriers practitioners face in conducting evaluation (Taut and Alkin 2003). In one of the few papers published on this topic, Tourmen (2009) divides the difficulties in evaluation into technical (or methodological, including which methods to use with available resources), and social (for example considering what end-users want and how they might differ from what the evaluator wants). In their guidance for environmental educators on how to evaluate projects, Stokking et al. (1999) caution that there are three main barriers to evaluation in the sector; lack of time, lack of funding and lack of expertise. From my research, I consider that it is most sensible to divide the barriers into methodological and practical barriers, with methodological barriers those relating to issues with evaluation itself, for example, how to measure things, and practical barriers, the daily issues that practitioners face in relation to conducting evaluation, for example, lack of time, i.e. the factors considered by Stokking et al. (1999).

4.1.1 Methodological barriers

As has been addressed in previous chapters, practitioners seem to be particularly concerned with improving the knowledge of their participants, often in the belief that this will give them positive attitudes towards the environment, and lead to them exhibiting pro-environmental behaviours. Knowledge, attitudes and behaviour are all complex things to measure, and some of the issues around these will be considered next.

The most common method of assessing a person's knowledge is by administering a test or quiz of knowledge. This can be problematic for the non-formal education sector as it may scare participants, or relegate them to pupil status by making the experience feel like school (Easton 1997). Ballantyne et al. (2005) summarised the three main problems with evaluating non-formal learning as; 1) there are no formal curricula or assessment guidelines against which to evaluate, 2) learning involves affective, cognitive and behavioural outcomes, and 3) the learning experience varies between learners. In addition, non-formal education tends to have heterogeneous audiences (Allen 2008) Learning is very complex, for example, existing ideas and knowledge possessed by a participant will greatly influence subsequent learning (Scott et al. 2007). If a person's

everyday understanding of an issue is very different from what is being taught, then learning will be particularly difficult (Driver et al. 1994). As individual participants may bring with them very different understandings, the knowledge that they gain from the project will also be very variable. Falk and Dierking's Contextual Model of Learning (2000) views learning as a cumulative and ongoing process through which individuals make sense of the world. Learning is influenced by interactions between a person's physical, sociocultural and personal surroundings (Falk and Dierking 2000, Falk and Storksdieck 2005). As a consequence of these interacting influences, learning is very hard to measure (Ballantyne and Packer 2005) and it is difficult to isolate the effects of any individual intervention.

Instead of measuring knowledge gained, many projects attempt to assess changes in attitudes as a result of participation, as it is assumed that attitudes are closely related to behaviour, and therefore improved attitudes towards the environment will lead to pro-environmental behaviour. The most common way of assessing attitudes reported in the literature is using a Likert scale, where participants rate how much they agree or disagree with a statement, usually in a pre- and post-test design. The most widely used scale for measuring environmental attitudes is probably the New Environmental Paradigm (NEP) scale (Stern et al. 1999) developed by Dunlap and colleagues in 1978 and later revised (Dunlap et al. 2000). However, there are several problems with measuring attitudes. Brossard et al. (2005) found no improvement in attitude from participation in bird monitoring according to the NEP and suggested this may be because the participants already had positive environmental attitudes. Either participants' attitudes did not change, or the scale cannot detect subtle changes. In addition, the act of actually taking a pre-test may influence the attitude found in a post-test (Fishbein and Ajzen 1975). More fundamental problems with assessing attitudes include increasing evidence that attitudes shift in the course of dialogue with others (Burningham and Thrush 2001), vary depending on how issues are framed by researchers (Macnaghten 1995), and very importantly, show weak predictive relationships with actual behaviour (Wicker 1969).

More recent literature has also highlighted the lack of a clear link between knowledge, attitudes and behaviour (Day and Monroe 2000). There is an increasing acceptance amongst the research community that raising awareness of an issue is only one of many factors that influence behaviour (McKenzie-Mohr et al. 1995, Jensen 2002, Bamberg and Möser 2007). This is a very important point because development of environmentally responsible citizens (i.e. changing behaviour) is the ultimate goal of environmental education (Hines et al. 1986/1987), and is often considered the Holy Grail of non-formal education programmes (Bonney et al. 2009). De Young (1993) describes three ways of

changing behaviour, of which using informational techniques (showing people the problem, the behaviour needed to resolve it, and steps needed to change that behaviour) is only one. The other ways are through positive motivational techniques (for example, providing monetary incentives for behaviour) and coercive motivational techniques (constraining choice in order to change behaviour). Thus, simple provision of information is often not sufficient for encouraging behaviour change. In fact, research has shown that people who take positive action towards the environment sometimes have no better understanding of the issues than those who don't exhibit pro-environmental behaviours (Monroe et al. 2000).

Stern (2000) summarises four variables which have a causal relationship with actual behaviour. These are attitude, contextual factors, personal capabilities and habit or routine. Hines et al. (1986/1987) conducted a meta-analysis of studies on behaviour change since 1971 and categorised predictors of environmental action into a person's 1) knowledge of issues, 2) knowledge of action strategies, 3) locus of control, 4) attitude, 5) verbal or written commitment to the issue and 6) individual sense of responsibility. Hines et al. (1986/1987) also highlight the fact that situational factors (including economic and social factors) can interact with the variables in their model, either by counteracting them or supporting them. Bamberg and Möser conducted an updated meta-analysis in 2007, and found very similar results to Hines and colleagues, with many complex and interacting variables needed to predict pro-environmental behaviour. These researchers found that intention to perform behaviour only explains around a quarter of the variance in actual behaviour (Bamberg and Möser 2007). Other researchers have found environmental attitudes to be reasonable predictors of behavioural intentions, but have noted barriers to putting intentions into practice (e.g. Evans et al. 2007).

There are numerous barriers to pro-environmental behaviour: Hernández and Monroe (2000) categorise these as external barriers, social personal norms (e.g. the extent to which you think your actions will earn you respect of others (Eiser 1994)) and personal values. Such barriers can prevent intentions being put into practice, reducing the ability of attitudes to predict actual behaviour (Evans et al. 2007). There is greater consistency between measured attitude and behaviour when both are very specific (Wicker 1969), for example, measuring attitude towards recycling is likely to be a better predictor of recycling behaviour than measuring environmental attitude more generally.

An alternative to measuring people's attitudes or intentions to perform behaviours, which as described above, are not necessarily good predictors of behaviour, would be to measure people's actual behaviours before and after participation in a project, but this is

also problematic. Few studies have been conducted which test whether self-reported pro-environmental behaviours are well-matched with actual behaviours (Camargo and Shavelson 2009), and there is some evidence to suggest these may not be consistent. For example, respondents may not give accurate reports about their behaviour, perhaps due to social desirability bias (responding in conditioned way that is socially desirable), and there may also be a difference between the way a person believes they behave and the way they actually behave (Olsen 1984).

In addition to the problem of identifying causal relationships between knowledge, attitudes and behaviour, and the issues with measuring them, there are other methodological barriers associated with project evaluation, including identifying and isolating impacting variables (Hofstein and Rosenfeld 1996). Broadly focused projects, characteristic of many environmental education projects, particularly non-formal ones (Ballantyne and Packer 2005), are particularly difficult to evaluate as there may be a large number of compounding factors, and thus it is difficult to explain exactly how any changes have occurred (Gough et al. 2001).

Another problem with evaluation of environmental education occasionally reported is that practitioners try to measure long-term phenomena from a short to medium term perspective (Fien et al. 2001). Practitioners participating in a distance learning course on evaluation appeared to attribute long-term outcomes to short programmes (Fleming and Easton 2010), the authors felt this may be because these long-term outcomes are often the justification behind funding the programmes. Ideally, follow up studies should be conducted three months and a year after the intervention, to assess its influence on attitudes and intentions to perform behaviours (Taff et al. 2007). Fleming and Easton (2010) encouraged practitioners to focus on short and medium term outcomes instead, as longitudinal data collection is largely impractical for them. This problem may not be limited to practitioners as Rickinson (2001) also notes a lack of research projects collecting data after the educational experience.

4.1.2 Practical barriers

In addition to these methodological barriers, there are practical barriers to evaluation of projects, which include lack of time, funds and expertise (Stokking et al. 1999). Easton (1997) notes that evaluation is often low priority for environmental educators and therefore tends to be poorly funded. This is not unique to the environmental education sector (see Bamberger et al. 2004), and often funders require evaluation but do not provide funding for this (Ellis and Gregory 2008). Lack of knowledge of how to evaluate may be a

significant barrier (Carleton Hug and Hug 2010), and this is particularly problematic as project funders are increasingly expecting evaluation to take place, often by internal project staff (Easton 1997). Some forms of evaluation may still require expertise outside of the organisation (Powell et al. 2006). There may also be institutional resistance to evaluation (Carleton Hug and Hug 2010), possibly due to negative experiences with previous evaluations, which may have provided unwanted suggestions or recommendations that were difficult to implement (Kleiman et al. 2000). Whitehall et al. (2012) suggest that motivation to conduct evaluation may be low, because the process of evaluation is not rewarding for practitioners.

The lack of culture of evaluation within environmental education (Fien et al. 2001) may be a barrier to evaluation of individual projects, as there is not an easily accessible body of evidence for practitioners to draw on. This is also the case in other sectors, for example, Rowe et al. (2008) report that there are few cases in the literature of empirical evaluation of public engagement activities, and they suggest this may partly be due to the lack of a widely accepted framework for evaluation. In their research into third sector organisations in the UK, Chapman et al. (undated) reveal that few organisations conduct evaluations in anything other than a piecemeal way, with many not seeing the purpose of evaluation since they *know* what they are doing is good. Within environmental education, it has been suggested that high level leadership is needed to encourage practitioners to evaluate (Fleming and Easton 2010, Crohn and Birnbaum 2010).

In this Chapter, the barriers that my sample of practitioners face related to project evaluation will be discussed, using insights gained from the focus groups and questionnaires with practitioners. This will be supplemented by the findings from the questionnaires and discussions with the participants. The research questions addressed and the methods used to answer them are shown in Figure 20.

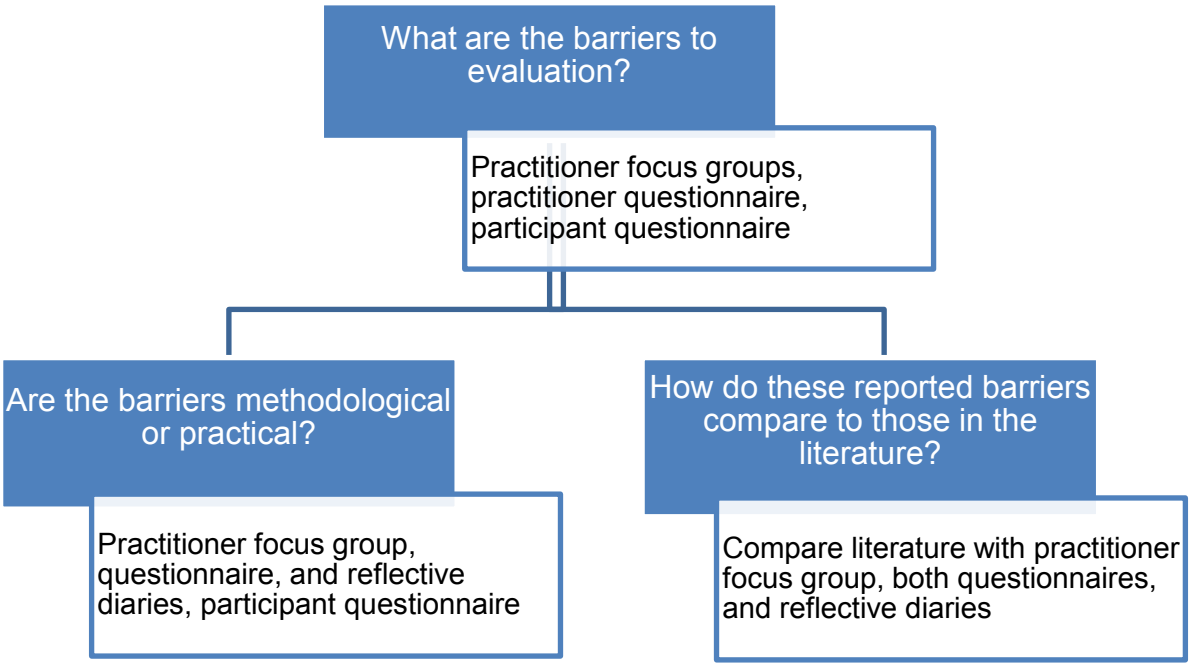

Figure 20 The research questions that will be considered in this chapter (blue boxes), with the methods used to answer them (white boxes).

I will also briefly discuss the implications of these barriers for the research design, which will be considered more fully in the next chapter.

4.2 METHODOLOGY

One of the original aims of this research was to work with environmental educators to develop new tools to evaluate their projects, and therefore the questionnaire included Question 12 which asked “If you don’t usually evaluate your projects, what would encourage you to do so?” and Question 14 “What do you think would be the key features of an ideal evaluation method?”. However, they actually served another purpose, that of providing space for practitioners to discuss the barriers they face to evaluating their projects. Similarly, although the focus groups were not designed to address the barriers faced by practitioners to project evaluation, these issues were frequently raised by practitioners in the paired discussion around the tools (see Chapter 2).

Full details of the people who responded to the questionnaires and the practitioners who participated in the focus groups can be seen in Chapter 2. In addition, three practitioners

sent back reflective diaries. This was much lower number than anticipated, as practitioners responded very positively to the idea of the reflective diaries when they were discussed in the focus groups. There are several explanations for this lack of response. Of the 28 practitioners who participated in the focus groups, five left their jobs or were made redundant and three changed their roles and moved to a more managerial role. The remaining 20 practitioners were very busy and tended not to respond to emails or letters. Consequently only three practitioners engaged with the reflective diaries.

Although this is a very small sample of my practitioners, they did span a range of different types of environmental education. Alison works will a small group of youth offenders for whom attendance at her fortnightly sessions is compulsory. Bev runs a monthly environmental club for a dozen or so young people, ranging from ages 12-18. Sam works at an outdoor education centre with large groups of sixth form students, whom she generally only sees once. Due to the disappointingly low response rate to the reflective diary, in November 2012 I decided to contact all practitioners by email with a draft of my first two results chapters and invited them to reflect on barriers to evaluation. Jonathan, Roger and Kevin all responded in detail to my email with information on what they perceived as the barriers to project evaluation. Jonathan works with Sam at the outdoor education centre, Roger is self-employed and works with primary school aged children to university students. Kevin is a manager at a large national non-governmental organisation, and is based at a nature reserve where the staff work with both schools and members of the public.

As the participant questionnaire was administered after the focus groups had been conducted, it was able to be designed to elicit responses indicating participants' feelings about evaluation. Question 7 asked participants "How do you feel about giving feedback or evaluating projects in general?"

4.3 Analysis

The text from the questionnaires and the focus groups was imported into Atlas, and all comments related to barriers to evaluation were coded as "Problems with evaluation". All text associated with this code was then exported into Excel for further coding. As the few reflection documents received were handwritten, the text was not inputted into Atlas, but any quotations relating to barriers to evaluation were added into the Excel document. The division of barriers into methodological and practical barriers occurred after analysis.

4.4 FINDINGS

Stokking and colleagues (1999) list three main barriers to project evaluation; lack of time, lack of funding and lack of expertise. The practitioners in my sample raised many additional barriers and these can be divided into three main areas: problems with conducting evaluation in general (methodological barriers), practical barriers (relating to resources, knowledge and attitude towards evaluation), and problems with specific tools. These barriers and the frequency with which they were discussed are shown in Table 19.

Table 19 The barriers mentioned by practitioners in the focus groups and questionnaire responses. Note that practitioners were not specifically asked about the barriers they experienced. The codes arose from the data, and were grouped into types of barriers after coding.

Type of barrier	Barrier	Frequency mentioned
Methodological	Outcomes are too long term for practitioners to measure	11
	There are no tools to measure the outcomes	9
	Practitioner and funder/participants want to measure different outcomes	2
Practical: lack of time and resources	Lack of time to do the evaluation	23
	Lack of staff to do the evaluation	5
	Lack of time to do the analysis	3
	Too time consuming for participants	2
	Difficulty fitting evaluation into rest of activities	2
Practical: reluctance to evaluate	Participants are reluctant to evaluate	21
	Practitioners reluctant to evaluate / don't see the point	3
	Other things more important	2
Practical: lack of knowledge	Lack of knowledge on how to do the analysis	4
	Need to ensure they are not leading	1
	Practitioners are not used to evaluating	1
Problems with specific tools	Results are too superficial / simplistic	9
	Tool is too complex for user group	7
	Interpretation can be subjective	6
	Tool is too generic	5
	Practical difficulties	3
	Responses not representing reality	3
	Tools don't meet needs of practitioners	3
	Don't pick up on outcomes other than those expected	2
	Badly designed forms	1
	Different tools aren't joined up	1

These barriers will each be discussed in turn, but it should be noted that there is overlap between some of these categories of barriers.

4.4.1 Methodological barriers

Some of the outcomes that practitioners, their organisations, or their funders, wish projects to achieve require long-term behaviour or results evaluation. For example, community cohesion was included by eight practitioners in their top five, but as Cath said "*you can't measure community cohesion through a day's wildlife activity can you? It needs to be a long-term project when you went back".* Cath was realistic about the types of evaluation she was able to conduct, but many practitioners were as Monroe (2010) described, "ever-optimistic" (p. 195), believing that they should be able to measure long-term outcomes, despite them taking place far beyond the timescale of evaluation (see also Fleming and Easton 2010). Funding for projects tends to be on a short-term basis, and the timescales for reporting are similarly short. This leads to an emphasis on monitoring of outputs (e.g. numbers of participants) and short-term outcomes (Ellis and Gregory 2008). As discussed in Chapters 2 and 3, the regular evaluation that is conducted by practitioners does tend to be reaction evaluation or more basic monitoring, although during the matrix exercise in the focus groups, often practitioners indicated that their tools could measure higher-level outcomes (see Tables 16 and 17). In fact, only two practitioners said that they had been involved in any longer-term evaluations, one as part of their PGCE (Post-Graduate Certificate in Education), and the other was conducted by a Masters student from a local university.

Longitudinal evaluation is not practical for most environmental educators in this sample, as many practitioners only see their participants once, and said they felt unable to assess whether or not any changes have occurred in the participants during their session. For those in this situation, several suggested that teachers or other group leaders might be better placed to evaluate the learning and behavioural outcomes; "*I think it is crucial because they know their clients probably better than we do, we work with them once a week, and they work with them day in day out and they might be able to see some changes"* (Heather). Similarly, during their paired discussion in the focus groups, Graham and Kristel talked about the difficulties with evaluating longer-term outcomes:

> Graham: *"Increased imagination, health benefits, you can't assess those"*
> Kristel: *"They are long term aren't they. These are the sort of things that the teacher of the class might pick up"*
> Graham: *"things like improved creativity, imagination, improved respect towards, attitudes, they aren't necessarily going to appear straight away. If you gave the*

teacher the questionnaire asking about those six months later, or at the end of the term, they would probably say 'oh yes, it had all these...'."

Many of the practitioners did provide the teachers or group leaders with evaluation forms, instead of conducting evaluation with participants themselves. However, often practitioners find that if these are administered on the day they yield very short responses because as Coralie suggested "*I think they'd really struggle while they are martialling them from the toilets to the minibus and getting everything ready, to give us any brain space [for evaluation]*". This is also a practical barrier: there is often insufficient time and space within sessions for evaluation to be conducted.

Mick hinted at another drawback with asking participants to evaluate immediately after a session, that it could lead to more positive responses than if the evaluation were conducted later; "*I think you've got to be really bad for people to give you low scores. When they come out they always enjoy it, regardless.*" In a different focus group, Sam made a similar point: "*how students feel when they are out doing stuff at the Arboretum or the National Trust are different to when they go back home to their normal routines*". Longitudinal studies can be a useful way of assessing impact more accurately, as they give participants time to reflect. They can provide a solution to the problem that participants may respond more positively to questioning immediately after the activity and when the practitioner is present. Two practitioners involved in the focus groups sent teachers evaluation forms to be completed after a few months delay, as they felt it was useful for allowing them time to reflect on the impact that activity had on participants. However. Coralie worried that if group leaders were given evaluation forms to take away "*we would be in the position where we were giving it to them to take away and then be hectoring them over the next six months to give it back*." In an email to me, Kevin also expressed concern that "*teachers [are] swamped with paperwork, schools may have limited time to follow up*".

Three other practitioners hinted that the forms of evaluation they use may be biased. Jonathan said they use letters and drawings as a way of evaluation their work but identified a problem with this "*you sort of get the inkling that the teacher sat them down in the classroom and said, 'right it's time to write a letter'… instead of it being their choice*". Andrew uses an evaluation game where he asks children to jump in the air, with the height they jump related to how much they enjoyed it "*It's a bit, in some ways it's biased, but it's a good way of seeing what's going on."* Anna had noticed that the length of time she works with a group influences the results she gets from her evaluation; "*I know that skews the feedback I get… we could have done the same thing… but because I've seen the*

people longer, they've invested more time in the feedback that they give you back, but if people are just kind of 'oh yeah', they'll do anything to get away from me again once they've got to go." This perceived reluctance of participants to take part in evaluations will be considered further later.

A practical barrier to conducting longitudinal studies is that participants contact details are often not kept, particularly those participants who have only been engaged for a short period of time, sometimes as little as a "*drop in open access hour's session in the park*" (Anna). Despite the brevity of these sessions, some practitioners felt under pressure from their organisations or funders to evaluate them.

The other methodological barrier mentioned frequently by practitioners (see Table 19) was that there were insufficient tools for them to measure the outcomes they and their funders were interested in, for example Kristel said "*Community cohesion, that's obviously the big number one at the moment, and I doubt there are any tools out there that really measure that*" and Leilah felt that "*Proving that people have sort of improved their self confidence and so on, that's a big thing with funders and developing your projects, but proving it is quite difficult*". Other practitioners felt there is a lack of tools that can evaluate "*long term attitude change*" and "*a change in public perceptions*" (questionnaire respondents). Tools do exist to measure these things, but these practitioners were not aware of them.

As highlighted in Chapter 3, some practitioners expressed surprise that the tools they regularly use do not measure the outcomes that they want their projects to achieve. This suggests a methodological flaw in the evaluation process. There was virtually no indication that any practitioners in this sample draw on evaluation theory when designing or selecting tools for evaluation. Only two practitioners (out of the total sample of 54) made any mention of research around evaluation, with one writing "*Am particularly interested in Bognors work. Am fully aware that evaluation of attitude / behaviour change needs to happen a good length of time after the learning experience. We don't have a system in place to do that*" (questionnaire respondent). Here they are referring to a study by Bognor in 1998 where he assessed students' knowledge of ecology before, immediately after and 3 months after participation in a programme about swifts. This practitioner also wrote *"At the moment we have standard 'how was your visit' kind of forms - useful for telling us how valuable the learning experience was. However we don't have anything that evaluates long term attitude change".* The fact that only two practitioners mentioned any evaluation research may highlight a lack of knowledge of the evaluation literature. If so, this would support previous research; a study of evaluators working on a large social service programme in the US, Christie (2003) found that only a minority (10%)

seemed to use any evaluation theory in their practice. If professional evaluators are not practicing based on established theories, as suggested Christie (see also Smith 1993 and Tourmen 2009), then it is not surprising that practitioners who are primarily environmental educators, not evaluators, are not using theory either. Thus, there is a large gap between evaluation as practiced by practitioners and that recommended by theorists (Christie 2003). Tourmen (2009) studied the practice of evaluators and found that less experienced evaluators relied on prescribed evaluation methods more than experienced evaluators who were more flexible in their methods, using what she terms "pragmatic knowledge" (p. 8). It should be noted that the evaluators in Tourmen's sample were either experienced professional evaluators, or students training to become evaluators. Therefore my sample of practitioners, for whom evaluation was just one part of their job, would be expected to hold pragmatic knowledge about evaluation which is even further removed from evaluation theory than Torumen's sample. This is important because evaluation theory can help practitioners choose which methods to apply and when (Shadish et al. 1991).

The other practitioner who mentioned evaluation research was a questionnaire respondent who suggested that "*Standardised evaluation would enable comparison with other groups, activities, venues, environments etc and would mean that we could share data with researchers undertaking larger studies*". In her large study of environmental educators in the United States, Fleming (2009) reports that a top priority for the environmental education community is to use findings from evaluation to design better programmes, as currently evaluation research and environmental education are not well linked.

Monroe (2010) recommends a new approach in which researchers and evaluators help practitioners develop logic models to explain why any changes occur. This would be helpful as it would encourage practitioners to be more realistic about what their programmes can actually deliver, and therefore what they can measure (Monroe 2010). Coralie said that she thought that assessing longer-term outcomes was "*really valuable, and it is really necessary because it gives us the solid evidence, we know all this is happening, but there is no solid evidence for it. But how do we get it? Because I don't know whether this same gap in the day is going to be suitable for that. Am I making sense?*" This is a really important point; the time allotted to evaluation as part of a 'normal' environmental education session may not be appropriate for evaluation of longer-term outcomes. Cath also recognised that longer-term evaluation was sometimes needed "*some of them have to be longer-term evaluation don't they, I mean you can't measure community cohesion through a days wildlife activity can you? It needs to be a long-term project where you went back*". These long-term results evaluations are impractical for

most practitioners who, as already discussed, may only see their participants for a one-off or short period of time. A more practical approach may be to follow the examples of Heather and Fiona, who had been involved in projects which used external evaluators at a one-off session dedicated to evaluation.

One of the most important methodological barriers to project evaluation may be that projects do not have clearly defined outcomes. This is problematic because "[p]rograms and policies that do not have clear and consistent goals cannot be evaluated for their effectiveness" (Berk and Rossi 1990, p. 15). As has been discussed in previous chapters, practitioners suggested a very broad range of potential outcomes of their work, and often felt that the outcomes they wanted to achieve were different from the outcomes their employer was aiming for. In addition, one practitioner felt that the outcomes they wished to measure were different from those their funder wanted them to measure, and another felt that the school visiting them wanted to measure different outcomes to them. Rovira (2000) and Monroe et al. (2005) suggest that many practitioners may not have even thought about their project outcomes before, and clearly this makes evaluation very difficult. This does seem to be the case for my sample of practitioners, with many stating that they had found the focus group process useful for thinking about evaluation.

Non-formal and informal education projects tend to have broader aims than formal education projects (Ballantyne and Packer 2005). Narrowly focused projects tend to be easier to evaluate as it is possible to explain how changes actually occur (Gough et al. 2001). The breadth of work which many of these environmental education practitioners conduct, in terms of content, age ranges, funding source etc. may be one reason why thinking about project outcomes is particularly challenging for environmental educators, and this leads on to problems with evaluation, particularly relating to evaluation methodologies.

4.4.2 Practical barriers

Practitioners raised many more practical barriers to project evaluation than methodological barriers. Most comments made about barriers were related to lack of time and resources so this issue will be discussed first.

4.4.2.1 Lack of time

Lack of time was mentioned by the majority practitioners taking part in this research (see

Table 19). Janet said "*I'm lucky if I get five minutes at the end of the day, that's the problem*". Jonathan explained that in his experience, evaluation is often conducted at the end of a long day; "*It's 9 o clock and you want to get home and you just quickly jot down the times of things and run out the door."* Similarly, Becky said that "*it's easy to miss that off the end isn't it, when you are really busy and have lots going on*". In email correspondence with Emma she wrote "*It is a bit mad here as I'm multi-tasking constantly (a teacher one day, caretaker the next, shop keeper the next and building manager all the time etc etc...)".* When practitioners are under such time pressures, it increases the chances of them not keeping records of sessions, or biasing the records by only noting down positive experiences, which Bamberger et al. (2004) state are important barriers to evaluation. When asked what would encourage them to do more evaluation, several questionnaire respondents indicated that they needed more time, for example; *"Some more spare time and dedicating a slot of the month to personal feedback or even better following the day immediately evaluating and then reflecting on that later on as well."* Bev explained that they had modified their feedback form as it was adding to their work load; *"we actually have to prove that we have taken notice of this feedback and done something with it. So if you've got loads of stuff, you're expected to do something with it, so keep it simple".* The new form was much shorter, asking fewer questions with only a small space for comments. Lack of time was one of the main barriers to environmental education evaluation identified by Stokking et al. (1999). This problem is not unique to environmental education; 76% of respondents to a questionnaire about evaluation in the third sector reported lack of time as a barrier to evaluation (Ellis and Gregory 2008).

Many of the practitioners expressed concern that evaluation can disrupt the day, for example "*Our problem is that quite often we are taking people out for the day, and it's very hard to have something that is part of the day that doesn't disrupt the day*." (Fiona). A questionnaire respondent felt that evaluation "*Shouldn't intrude on learners' enjoyment of the session".* Hellen said that *"the hardest thing I find is just getting the time to use them…I have them with me on events and things like that but I'm normally the only person there and it's kind of like, just feeling like people aren't really that bothered about it, not that interested in doing it*." This perceived ambivalence of participants towards evaluation was common and will be considered later.

Maxwell identified what can happen if evaluation is rushed "*sometimes if you don't have ample time for groups to fill in these evaluation forms, they just do it very quickly, so you don't capture the truth about it*" and suggested an alternative approach*; "So I think that enough time should be made where people can actually sit down and reflect upon the activity they have done, and then fill in*". Heather said a project she had been involved in

had held a dedicated evaluation session; "*there were eight sessions and then the ninth session was an evaluation session, so we're talking a big time commitment again*". She was one of the few practitioners who mentioned such extensive evaluation, which had been carried out by a Masters student. Fiona was part of a project whose funders required in-depth evaluation and she said *"What we've done with some of our groups is we have a commitment each year to do two detailed focus groups, so we'll go and visit a group before they have come out with us, and we'll go out after they've had a few visits as well*". Heather talked about the value of rich, detailed data; "*We want a lot of qualitative data in it, because the qualitative stuff speaks to me*". She did later say that "*I might think 'ooh I'd rather have the kids outside again rather than sitting indoors talking about it', but I suppose to prove a point it is useful isn't it, but I wouldn't like evaluation that takes a lot of time, all the time*". Striking the balance between not being onerous on participants and wanting rich, detailed data is tricky. Whitehall et al. (2012) report that "many practitioners are dismayed by the evaluation burden" (p. 211), feeling that evaluation takes time away from the programme. This was certainly the case for many of these practitioners, and given the time pressures they are under, the majority are unlikely to be able to find the time to conduct detailed evaluations.

Lack of time for analysis was also raised by a couple of practitioners, and Sam expressed concern about this to me in a conversation in January 2012. She apologised for not being able to send any reflective diaries in, and cited time as the main barrier: *"Even on a residential course, the time spent with students is shorter than ever."* This is because as costs for running the centre have risen, whilst school budgets have shrunk and therefore they do not stay as long as they did in the past. This makes it hard for Sam to "j*ustify even 20 minutes evaluation time*", let alone time for analysis and reflection. Sam was keen to increase the amount of time spent on evaluation and said that she was going to sit down with her colleagues to work out how to address the issue of a lack of time for conducting evaluations and analysing the results.

4.4.2.2 Lack of resources

A problem identified by several of the practitioners is that organisations have insufficient staff to evaluate their projects. When discussing individual observation as a form of evaluation, Roger said "*it's a luxury to have time to do something like that though*", and Katherine responded "*yeah because I'm always the one who is delivering so, when you're doing that sort of assessment you actually need someone else to deliver it and stand back*". Similarly, Fiona said "*If you are delivering a session, you are delivering a session and you almost need a second person to do that observation and to do it properly I think.*

We did manage to have an observer [once] and the evidence we've got from that is far more comprehensive than any of the others". However, Ruth summarised the feeling shared by many practitioners when she said "*in an ideal world it would be lovely to have a spare member of staff available. Namely the same one…the same list of questions and that person make notes themselves and then that person writes them up because then you've got a bit of consistency. But the reality is, that ain't gonna happen*". This highlights the difference between what practitioners would like to see in terms of evaluation, and the reality. Ruth's organisation did have a system of peer-observation of teaching in place, but when I mentioned this in another focus group, John said "*that's not possible because generally we're all doing delivery on the day, and if we're not doing it, we're on leave, and if we're not doing that we're catching up on the admin".* Clearly, lack of time is an issue again here, as is lack of budget. Often, although the majority of funders require evaluation of the projects they support, they do not provide a budget for evaluation (Ellis and Gregory 2008). Stokking et al. (1999) identified lack of funds as a key barrier to evaluation. Many organisations rely on volunteers to conduct evaluation (Ellis and Gregory 2008) and the short-term nature of most volunteering placements can contribute to a lack of institutional learning around evaluation.

External evaluation is also often under-resourced in terms of funding (Bamberger et al. 2004). In addition, external evaluators are often only brought in at the end of the project (Hernandez 2000), as evaluation is often only considered as an afterthought (Bamberger et al. 2004). This has been my experience, when I was invited by Nick from BEES to attend their residential weekend, he asked me to help evaluate their project as the report to their funders was due, and did not provide me with clear project goals against which to evaluate.

4.4.2.3 Lack of knowledge

Lack of time is clearly a barrier, but Anna suggested an additional reason "*it's a time thing, and also it's a knowledge thing*", highlighting that some practitioners may lack the knowledge or skills needed for analysis. Similarly, Heather said *"I do worry about the amount of time it takes, and how you draw it together*", and Bev said "*Very often you collect all this data and you don't use it*". Fiona said "*I'd be interested to know what people do with all that information once they've collated it, because that's our big thing at the moment, we've got all this wonderful information but it's what do you do with it isn't it?*" There may be several reasons why data does not get used. Lack of time to conduct the analysis is clearly an issue but may also lead to a lack of knowledge about how to process evaluation results, as practitioners are unlikely to be able to have time or budget to attend

training courses or knowledge sharing events. Lack of expertise is one of the recurrent problems identified by Stokking et al. (1999) and Ellis and Gregory (2008).

Many practitioners said that they found the focus groups a valuable opportunity to share knowledge about evaluation methods, and often left the group with new ideas written down. For example, Emma said she found the focus group to be "*really useful"* as she felt "*sometimes you need to refresh, you need to look at what other people are doing, and it's not about nicking ideas, but looking at best practice"*. Coralie said that "*a really useful tool at the end of this [research] would be a document where all the stuff is…a section on evaluations to use with school groups, a section on evaluation with teachers….you could actually have a little handbook that you publish and people could get hold of. That would be brilliant*". Kevin concurred with this and said "*It's the very thing that we don't have money for doing stuff like that, at all*". Creating such a handbook, or toolkit, was one of the original aims of this research.

4.4.2.4 Other practical barriers

Carleton Hug and Hug (2010) highlight institutional resistance as a barrier to evaluation, but this was not mentioned in the focus group or questionnaire responses. On the contrary, several organisations provided practitioners with standardised evaluation methods which they were expected to use as much as possible. In correspondence with practitioners after the focus groups, however, evidence of institutional resistance as a barrier did emerge from practitioners from two organisations. Jonathan wrote by email in November 2012; "*I've still been in the battle at work for gaining evaluation...it {the paper draft} will prove another useful recap and impetus to get work to be evaluating more and perhaps arm me with more arguments"*. Kevin emailed with a list of barriers to evaluation in his organisation: "*Inertia and fear of change – Implementing creative ways of assessing learning and meaningful feedback can meet resistance from educators who have tried / trusted / familiar methods and preferences. It's more 'stuff' to do. It's unfamiliar 'stuff'."*

4.4.2.5 Reluctant participants

Many practitioners said they felt that their participants were reluctant to evaluate (see Table 19). This feeling was also prevalent amongst the evaluators Whitehall and colleagues (2012) worked with. For the practitioners taking part in my research, many thought their participants might feel inconvenienced by the process. Katherine said that she needed an evaluation method that "*doesn't inconvenience the people who have*

probably paid to come to this event" and John said "*I don't want to be seen to be pressurising teachers in a corner saying 'I want some information out of you else you're not getting out the door' because once the visit finishes, I suppose they've got other things to be getting on with*". Many said that they felt their participants don't like doing evaluation, as Bev put it "*I think we've all had that feeling when you're at the end of a course and you're just about to go, or something, and then suddenly the trainer gets out the evaluation form and you can feel everyone in the room going 'urgh', and it's a case of 'get this done as quick as possible'.*" When asked if new methods would be useful for evaluation, a questionnaire respondent wrote "*an online system is tempting but the number of people who don't like doing things online probably at least matches those who don't like filling in questionnaires*". Teenagers were felt to be a particularly hard group to get any feedback from, as were low literacy groups. Leilah said "*some of the people we work with are slightly illiterate, so they have learning problems…evaluating their progress…can be quite difficult because they don't open up*". Since a very high proportion of the evaluation tools used by practitioners are paper-based (see Chapter 3), it is unsurprising that these practitioners find evaluation difficult with such groups.

Several practitioners felt that evaluation was an acceptable thing to ask participants to do if they had been working with them for a whole day, but not if it were a short (one hour or so) session. Chris and Bev work with a group of teenagers and were particularly concerned about asking them to evaluate their sessions, as they felt that they had come to have a good time, rather than spend time evaluating; "*we couldn't really hand this out to our group members because they would think that we had gone bonkers, because this isn't what they've come along for. They've come along for a good day out, to see a few things, and have a go with hand tools and getting muddy, and stuff like that, and then go home again."* Bev also runs events for members of the public, and said "*I always feel embarrassed asking people to fill in evaluation forms…we now have this extremely short card, it can't get much shorter to be honest…I don't feel so embarrassed about handing that out*" (Bev).

Although many practitioners expressed concerns that participants did not like evaluation activities, the findings from my participant questionnaire suggest that participants are more positive about evaluation than practitioners perceive them to be. Of the 48 respondents, 35 responded positively to the question "How do you feel about evaluating projects in general". These positive responses ranged from a simple "*OK*" to *"I think it's good because you can make the experience better*" and "*I always feel happy to give feedback on any projects as everyone has different opinions*". Others felt that evaluation was "*Ok if it helps*", highlighting the desire for the findings from evaluation to be used. Few

studies have compared perspectives on evaluation, but Whitehall et al. (2012) conducted a questionnaire with participants in a family intervention programme in the US and found that participants viewed evaluation as an opportunity for learning, and had more positive attitudes towards evaluation than practitioners expected them to.

Some participants said they were happy to evaluate in some forms but not others; "*Don't really mind if it's not a long form, also prefer tick boxes than writing comments*", and another wrote "*Ok if you talk about it. Don't really like filling in forms*." Only five respondents said that they did not like doing evaluation at all, with several saying they "*can't be bothered*". Two practitioners stressed the importance of involving participants in the evaluation process, so that they are engaged with it. Chris said "*we thought this was really good {points at form} because it is still short but it packs in a lot of stuff. I think people will see the point of answering the questions*". One practitioner questionnaire respondent said that key features of an evaluation method are *"To not be hugely time consuming and to be an interesting almost enticing and enjoyable thing to be done".* Participatory approaches to evaluation are those which engage the participants in the process of evaluation (Laurenz 2007), and several of the practitioners wanted to be more participatory in their approaches, for example, Chris said it would be useful to "engage people in the evaluation process, so that they actually see the value in us asking those questions", and Kevin wanted to involve participants more in shaping both the activities and the evaluation process "*what would be great is if you could now move to the position where the kids have a greater say in what the day is all about, and does it meet their own aims and expectations*".

At the BEES residential weekend, I had the opportunity to discuss the project with participants, who appeared very happy to talk about their experiences. However, when I asked participants to write comments down on paper, nearly all were reluctant to do so at first. Three flipchart pieces of paper were taped to the wall of the common room. One said "Best things so far", another "Things I've learnt so far" and a third "Things we should do differently next time". I said "*So those of you who aren't whittling, could you write something on the posters I've put up there?*", and one of the regular participants responded with "*Oh God, pass me a whittling knife*". No comments were written until several hours later when there were fewer people in the room. The majority of comments (29) were relating to things people had learnt and the best things (26), with only six relating to improvements, either suggesting participants were reluctant to give negative feedback (however constructive) or that they had few suggestions for improvements

Bev was initially sceptical about using any new evaluation forms with the dozen or so young people she works with, feeling that time is better spent doing activities. When she used a new evaluation form (Tool K (see Table 16 in Chapter 3)), she commented in her reflective diary that "*Leaders of event thought the sheet may be difficult for the young people to understand, but in fact they got the hang of it quickly*". In reference to how the evaluation would impact her work, Bev wrote "*Will incorporate more discussions about the learning aspects of the activity – trying to get a balance so they aren't 'put off' by too much of an educational session but still leave with new knowledge*. *Overall I liked this evaluation for using with this group and will use it again*".

4.4.3 Problems with specific tools

Alongside the problems with evaluation in general, practitioners also raised many issues with the evaluation tools they use. An issue that was raised in most focus groups was that many evaluation forms are "*far too long*" (Graham) and evaluation activities take too much time. Bev explained that "*we used to have the usual form of how old you are and where've you come from and blah blah blah, and by the time you've got through that bit, you've lost the will to live".* Hellen explained that evaluation can take out valuable time that she feels would be better spent outdoors; "*to be honest I'd rather spend 5 more minutes outside, spending time outside and doing what we came here to do, rather than messing about and getting kids to do stuff in the classroom and take photos for the funders*". Many of these practitioners felt under pressure to provide their funders with good photographs along with copies of completed evaluation forms, but many struggled to fit this into the session. Graham commented that a form was too long and said; *"I don't think there are any questions that could be removed, but there should be",* highlighting the tension between wanting quick evaluation methods whilst gaining detailed data. This was also summarised by this comment from a questionnaire respondent, saying that they wanted evaluation that was *"Easy to do while providing meaningful information"*.

Several practitioners indicated that they might like to be provided with standardised evaluation forms, as they felt this would help them to be a bit more joined-up in their approach, for example, Anna said "*it's all a bit of a nightmare, there's this one, that one, it would be good to get it joined up a bit more*" and a questionnaire respondent wrote *"I tend to be chaotic - having a standard would help me a). be consistent and b). remember to do it!*". As discussed in previous chapters, there was huge diversity in the types of groups individual practitioners work with, their ages, abilities, whether they were part of a formal or non-formal education programme, and the topics covered. It was surprising, therefore, that many practitioners did only have one or two evaluation forms that they used for all the

groups they worked with. This 'one size fits all' approach brings problems with it, for example, they may not meet the needs of the practitioner, as Cath said "*we're a little bit behind on the evaluation / feedback, there was one produced nationally but again it was really long and boring so we don't, we've been reluctant to use it*". Similarly, Nick said "*There is a lot of stuff in here which isn't really relevant. People really struggle to fill it in…I don't really feel they fulfil their role*". Nick said the reason for the irrelevant questions was that the questionnaire had been designed by the umbrella organisation which his organisation is part of, and they have different goals to his organisation. Similarly, Samantha said that courses run by her further education college use a form designed to assess student satisfaction for both their standard further education courses and their community courses, which she said the community participants struggle to complete as it has lots of irrelevant questions. Chris said he had been involved in a course jointly run by two organisations, so "*we had to get people to fill in two evaluation forms*", neither of which he found to be particularly useful for improving the course. A better approach, suggested by one of the questionnaire respondents, would be "*to have a wide range of tools available so that the most appropriate ones can be chosen to fit each situation*".

Several other practitioners also said that they had no control over what methods of evaluation they used, for example, as a self-employed practitioner, Roger said that his biggest problem with evaluation is "*trying to work out how I could improve something I was doing from other organisation's generic evaluation methods which weren't asking the right questions for me to get anything useful*" (email correspondence November 2012). He went on to give an example of some work he did for an organisation where "*they studiously approached attendees who'd just done my part of the event with evaluation sheets. It turned out afterwards that they were asking them about what they thought about the whole campaign and my bit didn't get any feedback at all. I didn't get anything useful from that and worked out in my own head what had worked best and what hadn't*". This perhaps highlights the need for practitioners to create their own evaluation forms, specific to the types of events that they run. As Bev put it, "y*our evaluation tool has got to match what you are evaluating, and be appropriate".* However, the time pressures practitioners are under makes the development of specific tools unlikely to be possible for many, as Jonathan put it in his questionnaire response "*[I have] little time to think about evaluation and even less to think about how to evaluate finding new tools to perform it."*. Another questionnaire respondent felt that there were many tools "*out there"* and that it took too much time to work out which were most appropriate.

Some of the tools brought by participants were thought to be too complex; "*you'd have to have a whole session to explain it in the first place wouldn't you*" (Jonathan). Bev made a

similar point in her focus group; "*You've got to explain all this, which takes energy, they've got to listen to you explaining it, whereas if you ask a straightforward question, they might actually give you an answer in half the time*" (Bev). Past experiences with complex tools had led to some practitioners changing their evaluation methods, for example, "*we started off looking at something like this {points at long and detailed questionnaire} but it was way too complicated, so we just kind of binned it and went onto a sheet with smiley faces on*" (Jen). Clearly this has limited use, as Heather put it "*it's hard to show the difference between happy, excited, confident, in a smiley face isn't it?*". Several other tools were felt to give ambiguous results, an example is the "Jelly baby tree" (used in Tool I, see Table 16 Chapter 3) which is a tree with little figures standing or sitting on different parts of the tree to represent different emotions. Participants are meant to colour in or circle the figure they feel most represents their feelings. Some of the practitioners liked the simplicity of this tool, others felt that it required too much subjective interpretation from the practitioner: "*you could read different meanings into this*" (Maxwell), "*Can be interpreted in a variety of ways. Difficult to use if they do not explain*" (Sam in reflective diary). Some practitioners suggested if this tool were used, participants would have to be given the opportunity to explain what their responses meant, which was felt to defeat the purpose of using a short evaluation method as it would be too time consuming.

Despite the desire of many practitioners for short, simple evaluation tools, some of the quicker methods were criticised for not providing enough detail; "*it doesn't say really what activities they have enjoyed and what activities they would like to do more of and what they wouldn't like to do again and it is quite sort of vague in that sense*" (Chris). Roger highlighted a problem with Likert scale questionnaires, used by many of the focus group practitioners "*You get that wonderful rosy glow if there is a line of crosses down there, you realise there is a problem if there is a load of crosses down there, but you don't find out what it is really*". This highlights the importance of having space for participants to write comments, a point which was made repeatedly throughout the focus groups, as Emma put it: "*the important stuff comes with those anecdotal comments rather than rate you one to four, because if they are happy they'll just go 4 4 4 4 4 all the way down. I do think there are more useful methods that give you more information*".

Several practitioners said that a problem they had encountered with forms using Likert type scales is that sometimes people get the scale confused; "*They put that they hated it, 'Enjoyed the activity?' 'disagree strongly' and then everybody else would copy, and they'd put 'it was brilliant, I'll come again'"* (Jen). This highlights another issue with some evaluations, rushed participants may just copy the answers put by previous respondents. Hellen said this was because "*people aren't very good at thinking, you know, whenever*

you fill in a questionnaire, it's like 'Any other comments to add?' 'No' ". There were other practical difficulties with tools, for example, Fiona said they had problems with using paper during evaluations when they do outdoor activities, as it tend to blow away.

4.5 CONCLUSIONS

This Chapter sought to explore the barriers involved in project evaluation. Barriers were divided into methodological barriers (those related to evaluation theory), practical barriers, and problems with specific tools, although these categories do overlap to some extent. Lack of time is the greatest barrier to evaluation in this sample of practitioners; time for thinking about outcomes, time for researching what evaluation methods are "*out there*" and most appropriate for the situation, time in the sessions to conduct the evaluation, and time to analyse the results, reflect on them and share findings with colleagues. The shortage of time that practitioners have to evaluate may also explain why there was little discussion of methodological issues or the evaluation literature, as practitioners are unlikely to have time to read environmental education or evaluation literature. Other researchers (Reid and Scott 2006, Carleton-Hug and Hug 2010) have highlighted the lack of contact between researchers and practitioners and this will need rectifying if practitioners wish to learn more about evaluation theory in order to improve the quality of their evaluations.

Evaluation is something practitioners should do, as they know their projects well (RCUK 2005) and are best placed to be able to improve their programmes based on the findings (Fleming 2009). Some practitioners aspired to evaluate long-term outcomes that are far beyond the timescale of evaluation, as found by Greene (2010). For evaluation of long-term outcomes, Chatterji (2005) advocates using mixed-methods designs, but such methods are impractical for most environmental educators to conduct themselves, mainly due to lack of time. However, the few practitioners who had experienced these more in-depth evaluations found them to be very useful. Such longer-term evaluation may be better left to researchers, masters or PGCE students who have more time to dedicate to the process and greater knowledge of the academic literature.

The daily pressures that practitioners are under to deliver their projects, report to funders, seek new funding, manage volunteers etc. means that many do not have time to think about evaluation, and they have even less time to engage with this research project. Consequently, continued participation in the research was very low, despite considerable initial enthusiasm from practitioners.

CHAPTER 5: CONCLUSION

5.1 INTRODUCTION

The aim of this thesis was to explore the current evaluation practice of environmental education practitioners. This has been conducted using a mixed-methods approach of questionnaires, focus groups and reflective diaries with practitioners, supplemented by a questionnaire and observation with participants. Very few studies have explored either what practitioners and participants see as the outcomes of environmental education, or evaluation practice in environmental education, and therefore my work significantly contributes to the field. Here I discuss the limitations of my study, particularly focusing on the characteristics of my sample, put my research into a wider context, and then summarise my key findings.

5.2 LIMITATIONS OF THE RESEARCH

Before discussing my findings, the wider context and my contribution to the literature, the limitations of this study need to be considered. Rose (1982) recommends that researchers give a natural history of the research, explaining how the research originated, the reactions to the research, and very importantly, any problems encountered during the research process.

5.2.1 Methodological approach

When I commenced this PhD, I had intended to conduct a participatory action research project, with myself and practitioners working together to develop improved tools for evaluating their projects. This methodological approach was suitable as it is a collaborative process involving research, action and participation (Greenwood and Levin 1998, Kindon et al. 2007), in which participants in the research are seen as co-researchers (McFarlane and Hansen 2007). I discussed the project design with several of the practitioners before I started, and we agreed that workshops (focus groups) which focused on the tools currently used for evaluation would be helpful. After these focus groups, the intention was for me and the other practitioners to use the tools with our participants over the summer, note down our comments about how the tools could be improved, and then bring these reflections back for a second workshop where we would

discuss both evaluation and the action research process. At the first workshop, all practitioners supported the idea of testing new evaluation methods and compiling a "*little handbook that you publish and people can get hold of*" (Coralie). As well as contributing to the handbook, or toolkit, the reflective diaries would have provided insight into evaluation practice over time. This action research design was well suited to my research questions as I wanted practitioners to contribute to the development of tools tailored to their needs, to empower them to continue changing their practice over time (Greenwood and Levin 1998), whilst giving me insight into their views on the outcomes of environmental education and their evaluation practice.

However, there was a low participation rate in the planned reflective assessment of evaluation tools, despite initial enthusiasm from practitioners. This meant that I did not conduct a participatory action research project, and therefore could not answer my question about the advantages and barriers to participation in action research. Instead, I continued to be as participatory as possible, by inviting practitioners to read draft chapters of the thesis (and short summaries of the chapters), and used the detailed comments which three of them fed back to help inform my thinking about barriers to evaluation. This is a form of respondent validation or member checks (Guba 1981). There are two main disadvantages to using respondent validation: firstly, some research participants may not be interested in the findings and therefore may not give feedback, and secondly, they may only respond if the findings are compatible with their image of themselves (Silverman 2006). This may lead to the ideas of those engaging in the respondent validation dominating the data. In order to avoid this, I used such comments simply to deepen the understanding gained from the other methods. Giving feedback as part of respondent validation can be a time-consuming exercise, and this may have been the major barrier for the practitioners in my research.

There may be several reasons why the low continued participation in the research occurred. Firstly, practitioners may have felt under pressure to support my research, despite me trying to be as neutral as possible, and therefore they may have agreed in the focus group to continue participating due to peer-pressure. This is a disadvantage of using the focus group method. In addition, eight practitioners were no longer able to contribute as they shifted roles or changed jobs during the period of research. The practitioners who stayed in their same role but did not engage with the research cited time as the main barrier to their participation, which is unsurprising given the predominance of this as a barrier to evaluation (Chapter 4). It could be argued that participation rates could have been improved if I had spent more time encouraging practitioners to conduct new

evaluations and reflecting on the process, but given the competing time pressures these practitioners are under, I did not feel this was appropriate.

The ‘action’ part of my research was to have been the co-creation of new or improved tools for project evaluation, but this was not possible due to the low response rate. Instead of exploring the co-creation of tools and reflecting with practitioners on the process, I decided to focus on the barriers to evaluation of environmental education, and therefore Chapter 4 has a different emphasis from what I intended when I started the thesis. Had I originally decided to focus on barriers to evaluation, I would have designed the practitioner questionnaire and focus group differently, to include specific questions on barriers. Despite the lack of prompting, 16 comments were made relating to barriers in the questionnaire responses and 113 in the focus groups (see Chapter 4, Table 19). The three practitioners who gave detailed feedback on drafts of Chapters 2 and 3 also commented on the barriers to evaluation. In the participant questionnaire, I was able to incorporate the question “How do you feel about giving feedback or evaluation in general”, because many practitioners had expressed that their participants were not keen to evaluate. This gave some opportunity for participants to raise any barriers to evaluation.

5.2.2 Sampling strategy

Purposive (or purposeful (Patton 2002)) sampling was used to select practitioners to participate in the focus groups, using pre-determined criteria for inclusion (Bernard and Ryan 2010). I wanted practitioners to represent a diverse range of environmental education providers, including small private companies employing one or two individuals, further education colleges, charitable organisations and local authorities. This diversity was desirable because I wished to gain credible information about evaluation from practitioners from across the environmental education sector. My initial sample was boosted using snowball sampling, in which key individuals are chosen and asked to suggest names of other participants (Bernard and Ryan 2010). Questionnaire respondents were found using a combination of a convenience sampling strategy (through two email lists and social media) and through the purposive sampling followed by snowballing as described above. The risk of snowball sampling, and convenience sampling, is that it may miss people who are ‘out of the loop’ because they aren’t involved in that social network (Rose 1982). The use of the email lists was an attempt to counter this. This may have boosted the representation of self-employed practitioners who might otherwise not have heard about the research. Although my practitioner questionnaire respondents only numbered 42, a sample of 20-60 knowledgeable people is generally felt to be sufficient to uncover and understand core categories (Bernard and Ryan 2010).

These practitioners worked with a large range of different ages and group types, in formal and non-formal settings, and therefore it is likely that a larger or different sample of environmental educators in the UK would share similar views on the outcomes of their work, have similar evaluation practice and face similar barriers to evaluation as my sample.

Similarly, my work as an environmental educator allowed me to select 28 focus group practitioners to represent a wide range of types of environmental educators from across Yorkshire, taking into account those who worked in cities, rural areas, in schools, with families, with young offenders, with adult community groups, and so on. This approach sought to maximise the different perspectives on evaluation. Authenticity, rather than sample size, is key in qualitative research (Silverman 2006) and whilst the dominance of certain themes may have differed slightly with a larger sample, the findings that emerged from the focus groups were broadly consistent with the questionnaire responses, suggesting that these results are trustworthy. This consistency was to be expected for sixteen of the questionnaire respondents who also attended focus groups. I had asked all practitioners attending the focus groups to complete the questionnaire before they attended. The intention behind this was to gain detailed information about the types of groups the practitioners worked with and the range of methods they used for evaluating. As only half of the focus group practitioners did the questionnaire in advance, this approach was not very successful, and instead just caused complications for analysing the data as there was some overlap between questionnaire respondents and focus group practitioners. However, there did not appear to be any obvious differences in questionnaire responses between focus group respondents and non focus group respondents.

Participant data, however, is less likely to be transferable outside of my sample as the questionnaire responses were only gathered at four events. This is an important limitation, and ideally questionnaires would have been conducted with at least one participant group that each practitioner worked with. This would increase both the credibility and the transferability of the findings. There are also methodological concerns with the participant observation data. A critique levelled by quantitative researchers of participant observation is that different observers tend to record different things (Silverman 2006), and therefore these data may not be a true reflection of the activities. Using different observers who then compare findings can increase the objectivity of the data (Flick 2006), but this was not possible here. Instead, I used participant observation in conjunction with other methods, to help deepen the understandings gained from the questionnaires and focus groups. However, participant observation should be carried out over a longer time period

than I used in order to maximise the credibility of the data. In addition, as I only conducted participant observation once, the findings from this aspect of the research may not be an authentic representation of these participants and certainly not transferable to other participants in environmental education. Therefore only tentative conclusions can be drawn from the participant aspects of the research, and I was only able to use the experiences and quotations from participants who had been observed in order to deepen the understanding gained through the participant questionnaires and to compare and contrast these with the views expressed by the practitioners.

5.2.3 Data analysis

I aimed to use an inductive approach to data analysis, where themes come from the data rather than prior understandings of phenomena (Bernard and Ryan 2010). However, it is important to recognise that my prior reading and my identity as a researcher will have impacted the way that I determined the categories used in my code book, the patterns I saw in the data and the way I presented the findings. In particular, I relied extensively on the Kirkpatrick model as a way of categorising the different types of evaluation method, but it is important to note that I read about this model only after I had collected and coded the data, and therefore it did not influence the way the data were collected. It did however have a large influence on the way I presented some of the data. This model was originally developed in order to evaluate the effectiveness of training courses, and it could be argued that it is not particularly suited to environmental education. However, the model includes both lower level reaction and learning evaluation and higher level evaluation which measures behaviour changes and results, and this is well suited to environmental education projects, particularly those wishing to encourage active participants.

A further limitation is the method used for analysis of the focus group transcripts used in Chapters 3 and 4. In order to provide some measure of the importance of different rationales for and barriers to evaluation, I used the frequency with which different themes were mentioned as a proxy for importance. However, this may not be the case. For example, a practitioner may have felt particularly strongly about a certain barrier and therefore initiated multiple discussions about it, drawing other practitioners into the discussion, thereby increasing the prominence of that code in the analysis. A disadvantage of using focus groups is that mention of certain topics may have encouraged others to express supporting views which, rather than representing the true opinions of the practitioners, may have been expressed because it is a social norm. It is important to recognise that people's accounts of situations are not direct windows to their experiences (Silverman 2006). The frequency data from the questionnaires is likely to be

a more accurate representation of the importance of different themes, as practitioners could not influence the responses of others.

When presenting quotations in written work, there is a risk of being accused of taking an anecdotal approach to data analysis, rather than a more rigorous approach. I tried to ensure that the reader saw how the quotations fitted into the wider data by presenting tabulations of the frequency with which different themes emerged. In addition, I chose quotations after content analysis, to demonstrate prevalent or contrasting views. Rose (1982) cautions that there is a risk that the views of people who engaged more with the research being more dominant in the research. I tried to counter this by ensuring that I used quotations from as many different practitioners as possible, rather than relying on one or two key informants. This was particularly important for the one 'focus group' which only had one practitioner attending, because they were able to express their views without anyone else present to counteract them.

5.3 THE WIDER EDUCATIONAL CONTEXT

Before considering the contributions that my work has made to the field of environmental education, it is important to outline some definitions of the field and therefore the areas to which my results can be transferred. Environmental education is difficult to define. This may be due to both the way the field was born and developments in allied fields since then. The field of environmental education emerged in the 1970s out of four distinctive but linked movements: environmental studies, outdoor education, conservation and urban studies. Each of these brought with it a slightly different interpretation of what environmental education is (Tilbury 1995) and what it can achieve. There is, however, general consensus that environmental education involves education *in*, *about* and *for* the environment (Tilbury 1995, Davis 1998).

5.3.1 Outcomes of environmental education

Education *in* the environment tends to be centred on the individual and activity based, with direct experiences seen as important for developing personal awareness and concern. Education *about* the environment involves providing participants with awareness, understanding and knowledge of human-environment interactions. Education *for* the environment has improvement of the environment as its goal, which involves encouraging active participation and a sense of responsibility (Tilbury 1995). This last goal is particularly interesting, as the 1990s saw the rise of Education for Sustainable Development (ESD), which was distinguished from environmental education by some authors as being more action-oriented. ESD, sometimes also called Environmental

Education for Sustainability, arose out of global concern for environment and development issues (Tilbury 1995). Agenda 21, the programme for action on sustainable development launched at the Rio Earth Summit in 1992, put education at its heart (McKeown and Hopkins 2003). The Belgrade Charter and Tbilisi Declaration had previously defined environmental education, but Agenda 21 placed a greater emphasis on the economy, and there was a shift towards addressing the needs of both society and the environment (McKeown and Hopkins 2003). As a consequence of the rise of ESD, there was a flurry of research papers attempting to define and differentiate environmental education and ESD. In their review of the literature, Eilam and Trop (2011) identified four main ways of conceptualising the relationship between the two fields. The first is that environmental education and ESD are separate but overlapping in that they share some common ground, in the second environmental education is absorbed by ESD, in the third they are separate but ESD is based on EE and in the fourth conceptualisation they are seen as the same (Eilam and Trop 2011). Stevenson (2007) notes that the difference between environmental education and ESD is not in the *process*, as both environmental education and ESD aim to encourage action through critical enquiry, but in the *subject*, with ESD including more human dimensions. I share McKeown and Hopkins' (2003) view that environmental education and education for sustainable development are discrete but complementary.

Jickling and Wals (2008) argue that there are two opposing ways of conceptualising education: education as transmissive and education as transformative. In the transmissive approach, education is seen as uni-directional transfer of information to the student. In the transformative approach, knowledge is seen as co-constructed, learning is shaped by prior knowledge and education's role is to enable students, of any age, to become critically aware of how they view the world and support their engagement with decision making processes (Jickling and Wals 2008). Stevenson (1987) sees formal education as mainly transmissive, but environmental education, as described above, aims to be transformative.

In this thesis, I recruited practitioners who conducted 'environmental education' and did not ask them to define the field. However, the outcomes that they feel their work can achieve (Chapter 2) are generally focused more on the environment than human development / sustainability issues. There were only two mentions of ESD, two uses of the word 'sustainability' in the practitioner questionnaire responses, and only two practitioners used the word in the focus groups, although one self-employed practitioner used the acronym NEWTS for her business which stood for Nature and Education Working Towards Sustainability. Practitioners in my sample were all conducting education

in and *about* the environment and the prevalence of outcomes such as 'care for the environment', 'respect for nature' and 'improved behaviour towards the environment' suggests that many are also conducting education *for* the environment, despite not referring to sustainability. However, my findings may only be applicable to environmental education, and cannot be extended to ESD without further study into where this sample of environmental educators see their work fitting in relation to ESD and how those defining themselves as ESD practitioners view the outcomes of their work and evaluation.

5.3.2 Evaluation of environmental education

Jickling and Wals (2008) argued that economic globalisation and the rise of the neo-liberal policies which call for free enterprise, free trade, and often a rolling back of the state in place of private companies has led to governments across the world pushing for schools to prepare their students to compete on the global stage (Jickling and Wals 2008). In order to demonstrate the quality of the education there are often centrally defined curricula against which achievement is measured using standard performance indicators. Gruenewald and Manteaw (2007) state that the move towards improved accountability is also present in environmental education, which as a field now needs to show (to parents, teachers, educational leaders and, importantly I would argue, funders) that it generates measurable learning. This may have arisen because of the close links between non-formal and formal environmental education. The majority of my sample of practitioners worked with both school groups and adult learners, and these blurred boundaries may have helped spread the evaluation culture from schools into environmental education in other settings. Neo-liberal policies have also impacted the non-formal education and higher education sectors (Alexander 2000), with adult education classes also having to demonstrate that participants gain skills and knowledge.

5.4 KEY FINDINGS

Despite the methodological and analytical limitations detailed in Section 5.2, my research has provided useful insights in the field of environmental education research in the UK. My main aim was to consider what the state of evaluation is within environmental education in the UK, by exploring what practitioners believe to be the outcomes of environmental education, the methods they use for evaluation and any barriers to their evaluation practice. Few studies have previously examined any of these issues, which is surprising as huge numbers of organisations and individuals run environmental education projects in the UK today, and evaluation of such projects is becoming increasingly important in this

era of accountability and austerity. I found that many of these practitioners are evaluating their work on a regular basis, but that much of this 'evaluation' is very basic and is unlikely to provide much insight into the longer-term outcomes that practitioners believe their work can and should achieve.

5.4.1 Outcomes

In Chapter 2 I explored what practitioners and participants see as the outcomes of environmental education, and compared this to the very limited literature on this topic. My samples of practitioners work with a large range of different groups, and practitioners believe there to be a similarly diverse range of outcomes of their work. This was to be expected, given the breadth of projects that the field of environmental education encompasses (Heimlich 2010) and that it can involve education *in*, *about* and *for* the environment (Tilbury 1995, Davis 1998). As one of the key aims of environmental education is to develop the skills and attitudes to allow people to understand their relationship to the environment (IUCN 1970), it is unsurprising that outcomes *for* the environment were those mentioned most frequently by practitioners, for example care for the environment, and increasing knowledge about the environment. In addition, practitioners suggested a large number of different outcomes for the individual taking part in environmental education, for example practical and social skills, and improved health. These are more aligned to education *in* the environment, and during the focus groups, outcomes for the individual were ranked by practitioners as nearly as important as outcomes for the environment. This gives new insight into the broad range of outcomes that practitioners believe can be achieved through environmental education.

Little research has been conducted into what participants see as the outcomes of environmental education and although the findings from my limited sample may not be transferable to environmental education participants more widely, my respondents also perceive there to be a wide range of outcomes of environmental education. I compared the outcomes raised by practitioners and participants and although the range of outcomes suggested by participants were similar, participants raised outcomes for the individual, such as meeting new people, more often than outcomes for the environment. Practical and social skills that were gained whilst participating in environmental education were also mentioned, highlighting the personal and social benefits that can be gained through participation. If future studies find similar results to this sample of participants, then practitioners may wish to try to maximise the occurrence of these outcomes when designing programmes, as the social aspects may encourage participants to keep attending.

5.4.2 Evaluation of methods

Few studies have examined the evaluation practice of practitioners in any field (Henry and Mark 2003) and to my knowledge, there are very few specific to environmental education, and none of these are from the UK. McDuff (2002) studied the past evaluation practice of a large environmental education organisation in Africa, and Zint and colleagues (2011b) conducted an 'evaluability assessment' to assess the evaluation skills of people running projects funded by the US Forest Service. A further two papers have inferred evaluation practice by reviewing journals (Carleton-Hug and Hug (2010) and Zint (2012)). In the UK, to my knowledge only a single study (Ellis and Gregory 2008) has examined the monitoring and evaluation practice of organisations in the third sector, which may or may not have included environmental education organisations. This large study also involved surveying funders and commissioners of research to provide information about what they require from funding recipients in terms of evaluation. Despite the diversity within the third sector, their findings are similar to mine about the state of evaluation: organisations feel under pressure to conduct more evaluation, which is often under-resourced, and the data collected is of variable quality. The measures to improve accountability in formal education, where schools assess knowledge gained by pupils using standardised tests, do appear to have spilled over into environmental education (Gruenewald and Maneaw 2007, Jickling and Wals 2008) with practitioners feeling the need to prove the worth of their activities through evaluation. The key rationales for evaluation (Chapter 3) were to report to funders and to improve their practice, but there were other reasons too, for example, wanting to gain positive comments that could be used in publicity. It is interesting to note that practitioners did not appear to be particularly concerned about measuring knowledge gained over time, perhaps suggesting that they are not driven by needing to demonstrate learning outcomes.

In Chapter 3, I explored the range of evaluation methods used in environmental education, by asking practitioners themselves how often they evaluate, the form that these evaluations take and why they evaluate. There was considerable variation in the amount of evaluation conducted by practitioners in my sample, the majority felt it was a key part of their work but others conducted very little. At first glance, it may appear that more evaluation is taking place than is suggested by Carleton-Hug and Hug (2010), Zint (2012), and others, but it is important to note the types of evaluation that are regularly conducted and the methods used. Practitioners used a wide range of methods for evaluating their projects and I used the Kirkpatrick evaluation typology in order to classify these. This typology is commonly used in business and industry settings but, to my knowledge, it has

not been used in the environmental education sector before. I found that, although most practitioners reported that they evaluate regularly, the majority of this is reaction evaluation, a simple assessment of whether or not participants enjoyed themselves. As most of the tools used by practitioners were in the reaction level it could be argued that this indicates the Kirkpatrick typology is too insensitive, as it cannot distinguish between the majority of evaluation conducted by practitioners. However, when the tools used are looked at in detail, they are indeed very similar to each other, mainly asking how much participants enjoyed themselves and asking participants to say whether they felt they learnt anything new. Therefore I think the Kirkpatrick typology is a useful starting point for investigating evaluation practice within environmental education, but the reaction category could be broken down into sub-categories to help distinguish between the different tools used by practitioners.

Interestingly, the focus group matrix exercise (discussed in Chapter 3) showed that practitioners often felt that the evaluation tools they used regularly were able to evaluate the more complex, longer-term results and behavioural outcomes, possibly because achieving such outcomes is what they are funded to do and they want to prove their activities are beneficial. The rise of neo-liberalism and the associated need for accountability has arguably homogenised the educational landscape, and the drive to measure success against pre-determined targets may have led to a standardisation of evaluation practices as educators demonstrate their worth (Jickling and Wals 2008). Certainly amongst my sample of practitioners there was a dominance of questionnaires and feedback forms as methods for evaluating projects.

In Chapter 2 I presented evidence to show that many of these practitioners assumed that outcomes such as enjoyment and improved knowledge would automatically lead onto longer-term behavioural changes, although there is an increasing body of evidence to suggest this is not the case (e.g. Kollmuss and Agyeman 2002). This is a significant finding because this suggests a disparity between the beliefs of practitioners and the published literature about behaviour change. Environmental education is often distinguished from other forms of education by its desire to create action-oriented individuals who have the skills and knowledge needed to engage with society and the environment, so it is unsurprising that my sample of practitioners want to achieve these outcomes. The desire to achieve them may have clouded their judgement of their evaluation tools, believing they can measure such outcomes. This may have led to the disparity between my interpretation of what the tools can measure and that of the practitioners during the focus group matrix exercise. Previous literature (e.g. De Young 1993, Hattie et al. 1997) suggests that published evaluation reports tend only focus on

positive findings. In Chapter 2 I reported that practitioners participating in my research appeared to be very optimistic, supporting Monroe's (2010) assertion that many environmental educators who are trying to "save the world" (p. 194) have positive attitudes. Although passion and enthusiasm are important for helping to inspire a younger generation, it can be problematic because it can cloud judgement and bias results from evaluations. This may help to explain the lack of published studies reporting on negative findings, although it is also important to note that some academic journals are reluctant to publish evaluation reports of any kind (Monroe 2010).

5.4.3 Barriers to evaluation

An understanding of the barriers faced by practitioners in evaluating their projects is needed if their practice is going to be improved, and I discussed these barriers in Chapter 4, using data collected through the practitioner questionnaires and focus groups. Few studies have been conducted into the barriers to evaluation faced by practitioners of any discipline, and to my knowledge there are none specific to environmental education, although Stokking et al (1999) and Carleton-Hug and Hug (2010) use their own experiences to suggest barriers. Therefore, the research presented in Chapter 4 significantly advances the field. I divided the barriers faced by practitioners into practical barriers, methodological barriers, and problems with specific tools, although there is overlap between some of these categories. Although practitioners mentioned a large range of different barriers, perhaps the most important one is lack of time, supporting previous research by Ellis and Gregory (2008) and Stokking et al. (1999). I classified lack of time and resources as a practical barrier to evaluation, along with lack of knowledge about evaluation and the reluctance of participants to take part in evaluations. Lack of knowledge about evaluation is an important practical barrier, as it may mean that practitioners do not possess the skills needed to conduct robust evaluations. Some practitioners felt reluctant to ask participants to do evaluation, as they felt that participants would rather be "*doing what we came here to do"*, rather than filling in forms. The majority of participants questioned, however, saw the need for evaluation and were happy to engage with it, and therefore this barrier may not be as important as some of these practitioners perceived it to be, although a larger and more representative sample would increase the confidence in this claim.

Practitioners commonly had to juggle finding future funding, managing sites and taking group bookings whilst delivering their education sessions. Not only does this lead to the practical barrier of lack of time to actually conduct evaluations, it creates methodological barriers too, with practitioners having little time to think about which methods would be

most suitable for their needs. Instead, practitioners tend to follow whatever evaluation process was in place before they started the role, or follow instructions given to them by someone else in the organisation. This may have helped contribute to the disparity reported in Chapter 3 between the outcomes that practitioners want to measure and what the tools they actually use are able to measure. A key methodological barrier to evaluation was that the outcomes that practitioners wanted to measure, for example the ones relating to improved behaviours towards the environment and improved health and wellbeing, require longitudinal study. Several practitioners expressed that this type of study was not practical for them, and in some instances practitioners felt there were no tools available to measure such outcomes. Outcomes which involve changing behaviours are very difficult to evaluate, as evidenced by the lack of such evaluation studies in the literature compared to evaluations of changes in knowledge (Zint 2012).

Practitioners also raised many issues with specific tools that they use, some of which were felt to be too simplistic whilst others were seen as too complicated for the user group. Again, this situation may have arisen because practitioners have not had sufficient time to dedicate to developing specific tools for projects, and are instead using those developed for other purposes. Another barrier, mentioned by several practitioners, is their reluctance to evaluate, feeling that they would rather spend the time outside. This may be because these practitioners do not see evaluation as part of their role.

5.5 Practical implications and recommendations

Based on the knowledge I have gained through this thesis, I have a number of practical implications and recommendations to make. In Chapter 2, I suggested that many practitioners had not thought in much depth about the outcomes their work can achieve. Engagement with researchers and evaluators has the potential to help encourage thinking about outcomes and the ways in which they are achieved, or not. Increased dialogue with researchers and evaluators could help to improve both evaluation practice and allow an exploration of the links between the reaction evaluations regularly conducted by some practitioners and the more complex longer-term outcomes that many of them, and their funders, want to evaluate. In order to improve the quality of evaluations conducted in environmental education, and acknowledging the barriers to evaluation, I believe there are two approaches that could be taken: either practitioners could try to ‘upskill’ in order to improve their evaluation, or they could leave the more in-depth evaluations to external evaluators or researchers.

The first approach would be to improve the ability of practitioners to conduct the longer-term outcome evaluations that their funders require. This could be achieved through use of tools such as MEERA (My Environmental Education Evaluation Resource Assistant). MEERA allows practitioners to learn about evaluation and plan their evaluations (Zint et al 2011a). In addition, improving the skills of practitioners themselves through training and knowledge sharing about evaluation is important. Zint et al. (2011a) suggest that "evaluation experts" (p. 491) have a role to play here too, and practitioners should consult with such experts who could offer reassurance and support around evaluation, thereby increasing practitioners' confidence in their ability to conduct evaluations. Support tools such as MEERA, and training courses, may be useful to reduce the methodological barriers and the problems practitioners have with specific tools, but I suspect the practical barrier of lack of time for thinking about and conducting evaluation will still be insurmountable for many practitioners.

The alternative approach would involve practitioners being realistic about what they are able to evaluate well, and leave longer-term evaluation to professional evaluators or researchers. By professional evaluators I mean people who are external to the organisation and whose services are employed to conduct an evaluation. There are several advantages of bringing in professional evaluators or researchers. Knowledge of evaluation theory appears to be lacking within my sample of environmental educators, supporting previous work with environmental educators (Monroe et al. 2005), and the employment of an external evaluator would increase the chances of practitioners using evaluation methods based on accepted evaluation theory. Powell et al. (2006) describe an environmental organisation in the US which employed the services of an external evaluator to establish an evaluation programme, taking into account the needs of the organisations and participants. Once the evaluation process had been established the practitioners ran it themselves, and this approach may be sensible for some of the time-poor environmental educators in my sample. In addition, Monroe et al. (2005) suggest that practitioners may appreciate help from evaluators in both identifying and evaluating short-term outcomes as longer-term outcome evaluation is impossible for many practitioners to conduct. It is important to note that I am not advocating that all projects need professional evaluators, instead I am recommending that some professional evaluations are conducted and that mechanisms are put in place for other practitioners to learn from these evaluations. If professional evaluators are clear about their evaluation methods, the processes by which any changes occur, and publish their work in an accessible way, then practitioners can cite such studies in their funding applications. This would allow the environmental education community to use the findings from evaluations to design better programmes, which Fleming (2009) reports is a top priority for US environmental

educators. If practitioners are able to leave the longer-term outcome evaluations to researchers or professional evaluators then they could instead concentrate on improving the quality of their reaction and learning evaluation, which may provide them with more useful information that they can reflect on and use to improve their practice. The time gained could also be used to conduct more participatory evaluations, where they share their intended outcomes with participants, to give both parties the opportunity to assess how the actual outcomes differed from the intended, and to discuss any unintended negative outcomes. However, using external people to conduct more detailed evaluations may not be feasible for many practitioners due to budget constraints.

If longer-term evaluation of environmental education is only conducted by researchers or professional evaluators as I have suggested, then careful consideration needs to be given to the ways in which the findings from such evaluations and research are communicated to practitioners. If the findings are communicated well, then practitioners can cite the studies in evaluation reports required by their funders. More research needs to be conducted into how practitioners currently obtain information about environmental education research, as within my sample there was little mention of the environmental education or evaluation literature (Chapter 4). Once again, lack of time to read publications such as “Environmental Education”, the termly journal produced by the National Association for Environmental Education, may be an issue here. There may also be issues with practitioners not having access to peer-reviewed environmental education publications as many do not work in institutions which subscribe to these services.

One solution to the issue of lack of time and inability to access peer-reviewed research would be to establish a website which summarises the findings from research papers in a succinct and easily understood form. A similar scheme already exists for land managers: Conservation Evidence (http://conservationevidence.com/) aims to provide information about the effects of conservation interventions through short summaries of published papers. Authors are encouraged to submit suggestions of papers to be included on the website, but most summaries are created by staff at the Department of Zoology, University of Cambridge, who run the website. They provide the key messages, any background information and definitions, and then summarise the research paper. A link to the research paper is also available, which is useful for open access journals and for people who have institutional access to journals. Conservation Evidence is designed for busy conservationists and land managers, and I think a similar scheme could work very well for environmental education, if funding were available to establish the website, promote it to educators, and for ongoing maintenance. This may also encourage practitioners to contact evaluators and researchers who may be interested in conducting longer-term

evaluations of their projects. Greater communication between practitioners and researchers about evaluation through such a website may help to encourage those designing programmes to learn from each other, share best practice and think in more depth about the links between the short and longer term outcomes of their work.

5.6 FUTURE RESEARCH

This thesis has advanced our understanding of what practitioners believe environmental education can achieve, their evaluation practice and the barriers to evaluation. There are two main areas of research that require more examination in order to improve our understandings of environmental education evaluation.

5.6.1 Outcomes

Thinking about the desired outcomes of a project is an important first step in outcome-based evaluation. Outcome-based approaches are very commonly used by evaluation professionals and practitioners in a variety of fields. In the UK, this popularity may have arisen from the use of such approaches by government departments and the research that they commission (Ellis and Gregory 2008). In Chapter 2, I discussed the different outcomes that practitioners and participants feel that environmental education can achieve. I grouped the outcomes suggested by practitioners and participants into outcomes for the environment, for the participant, for society and for the institution itself. This differs from the definitions of environmental education set out by the Belgrade and Tbilisi meetings which focused on education *about* and *for* the environment, rather than education *in*. Practitioners and participants felt that environmental education could deliver vitally important outcomes for individuals such as improving health and wellbeing, so it is important that such outcomes are acknowledged alongside the outcomes for the environment itself. It would be interesting to see if these different outcome groups are applicable outside of the UK, as listing potential outcomes of projects under these headings could be a useful way for all practitioners to begin the process of evaluating their projects. However, further research is needed to explore the different interpretations of the word “outcome”, particularly as it is so often used in the literature, by funders and in government documents. In the participant questionnaire, I chose to use the word “benefits” instead, as my pilot participants were unclear what the word “outcome” meant. Practitioners frequently used the words “goals” “aims” “objectives” as well as outcomes and benefits, and research into the different meanings people ascribe to these terms would be useful. This could be done using “Personal Meaning Maps” (see Storksdieck et

al. 2005), where people are provided with a piece of paper with the word written on it and are asked to write down definitions, thoughts and words that they associate with the word.

It would be interesting to conduct further research to see whether there are genuine differences between what practitioners think their participants gain from the projects and what the participants themselves feel they gain, or whether this is an artefact of the different terminology used. If there is a difference, then it would be even more sensible for practitioners and participants to spend time together discussing their aspirations for the project, to encourage co-development of the project to ensure it is meeting the needs of the participants. A future study of participants' views on the outcomes of environmental education should involve a larger sample size and more robust sampling frame in order to maximise the number of different types of participants. It could combine questionnaire and focus groups as I did for the practitioner research, as this approach worked well in deepening the understanding gained through the questionnaire.

Only a very small number of practitioners in this sample evaluate whether or not any higher-level outcomes such as learning and shifts towards pro-environmental behaviour occur. It would be interesting to explore whether practitioners are even teaching with the aim of inspiring positive action. It may be that practitioners subscribe to the view that environmental education is about acquisition of knowledge about the environment, rather than about developing environmentally active citizens. Eilam and Trop (2011) summarise four essential principles which they believe are all required in order to create active citizens and encourage environmentally responsible behaviour, and a study could be conducted into which of these principles practitioners use in their work. The basic principle is 'non-natural learning' which involves participants taking notes from a teacher. Multi-disciplinary and multi-dimensional systems learning build upon this principle and help students develop new ways of thinking. The fourth principle, emotional learning, creates motivation to change. This, combined with the cognitive processes of the other principles, is likely to lead to action (Eilam and Trop 2011). Stevenson (1987) argues that this problem-solving, action-oriented focus of environmental education is what sets environmental education apart from traditional schooling. A questionnaire of environmental educators, followed by individual interviews could be used to explore the principles that they use in their work, as well as the goals that they wish to achieve.

5.6.2 Evaluation

In this research, practitioners commonly discussed needing to evaluate "*for the funders*", and I relied on my own experiences and practitioners' perceptions of what funders expect

from them in terms of evaluation. Research by Ellis and Gregory (2008) found that some third sector funders are asking for so much evaluation that they experience information overload. Their research suggested that little cross-programme learning and dissemination of best practice takes place. It would be interesting to conduct research into what forms of evaluation funders of environmental education actually expect and why they want this evaluation to take place. Is it so that they can demonstrate how their money is spent? Or is it so that the recipient organisation can learn from the process and improves their practice in the future? A desk-based study of funders' websites to review their reporting requirements combined with a questionnaire aimed at those who fund environmental education projects could help to answer these questions. This could be administered online, using funding databases such as GRANTfinder to identify the sample.

One of the original aims of the research was to create a 'toolkit' containing copies of evaluation methods that could be used by practitioners. This toolkit aimed to reduce the amount of time practitioners would have to spend developing their own tools, allowing them to spend more time analysing their findings and disseminating the results. I think this is an area of work that should be further developed, as this was supported by many of the practitioners participating in my research and several of their organisations have contacted me since I began the thesis asking for copies of the tools. The original intention was that practitioners were going to trial the tools and give me their feedback, which I could then incorporate into a revised version, using my knowledge and experience as a researcher to ensure that the tools were as unbiased as possible. This iterative process would have led to the creation of a collection of tools which would be suitable for use by other environmental educators. A disadvantage of such a toolkit could be that it discourages practitioners from thinking about the specific outcomes they want to achieve with their projects, and could therefore lead to poor choices of evaluation methods. However, I feel this potential disadvantage would be outweighed by the advantages of having a selection of tools readily available for practitioners to use, providing they are accompanied by advice on how to modify them for each individual project. I began creating this toolkit as a website which contained links to all the evaluation tools provided by practitioners, and if time and funding were available to update this website then it could be publicised to environmental educators through networks such as Learning Outside the Classroom and the National Association for Environmental Education.

5.7 CONCLUDING THOUGHTS

This exploration of methods used in evaluation is important as practitioners are increasingly being asked by their funders to evaluate their work, as part of a broader trend towards improved accountability in society. The practitioners in my sample were conducting the majority of evaluations themselves, alongside all of their other responsibilities. Gaining an understanding of their evaluation practice in terms of what they do, why and how often, and sharing this with other practitioners is useful for several reasons. Firstly, sharing knowledge about evaluation can help other practitioners develop and improve their own evaluation practice, which can satisfy the needs of funders and enable them to secure more funding in the future. This is important because although environmental education has the ability to reconnect participants with the natural world and help people to develop concern for the environment, it can be hard to justify funding such projects in these times of austerity and belt-tightening. Secondly, opening up dialogue around evaluation is useful as it allows best practice to be shared, both in terms of evaluation but perhaps more importantly about how environmental education is delivered most effectively.

As an environmental educator, I instinctively know that some projects have gone better than others. Some children have been really inspired to spend more time with nature, whether that is going back to the pond to fish more tadpoles and newts out the next day, or have taken banded snails home in a jar to lovingly look after. On other projects I've come away with the feeling that I've not made any impact on them at all, they are going to continue being a bit disgusted by worms, and couldn't wait to get back to their computer games and television screens. But having an instinct about these things is not sufficient; funders aren't going to give me or other environmental educators money just because we *feel* that people take something valuable away from our sessions, and we *know* they have a good time, because they tell us that when we ask them at the end of our sessions. As this thesis has shown, this reaction evaluation is often the only form of evaluation that practitioners conduct. Being open about evaluations that we conduct and sharing worst as well as best practice is important, because it means that others can learn from us, and we're not all making the same mistakes over and over again. As the ultimate goal for many environmental educators is to ensure that our planet can continue to support us and future generations, this learning from each other isn't just a nice thing to do, it's critically important.

Appendix 1 - Practitioner questionnaire

Evaluating environmental education questionnaire

This questionnaire is designed for use by environmental educators. It should take no more than 10 minutes to complete. It is part of an OPAL project that will help develop new tools for evaluating environmental education. OPAL is a national project funded by the Big Lottery Fund and aims to inspire a new generation of nature lovers.

All answers will be kept anonymous and your details will not be passed onto anyone else. If you've got any questions or comments about this questionnaire please contact me via 01904 324577 or sarah.west@york.ac.uk

1. What is the name of your organisation?

2. What is your job title?

3. What type of organisation do you work for?

- ◯ Non-Governmental Organisation
- ◯ Voluntary
- ◯ Proft making
- ◯ Government agency
- ◯ School
- ◯ Local Authority
- ◯ Other (please specify)

4. Which ages do you work with in your environmental education activities? Please tick all that apply.

- ☐ Under 5
- ☐ 5-10
- ☐ 11-13
- ☐ 14-17
- ☐ 18-25
- ☐ Over 25

Evaluating environmental education questionnaire

5. What types of group do you work with? Please tick all that apply.

- [ ] School (state)
- [ ] School (private)
- [ ] Youth clubs
- [ ] After school clubs
- [ ] Scouts / guides
- [ ] Pupil referral unit
- [ ] Not in employment, education or training
- [ ] Other groups (please specify)

6. What do you see as the potential outcomes of environmental education? This could be for participants, for communities or for societies. Please list any you can think of.

7. How important is evaluation in your work? Please tick one answer.

- ◯ Very Important
- ◯ Fairly Important
- ◯ Neither important nor unimportant
- ◯ Not very important
- ◯ Not important at all

Why is this?

Evaluating environmental education questionnaire

8. How often do you evaluate your projects?

- ◯ Every day
- ◯ Weekly
- ◯ Monthly
- ◯ Quarterly
- ◯ Once a year
- ◯ Less often
- ◯ Never
- ◯ Don't know

Please use this space to comment if you wish

9. Who carries out evaluations of your projects?

- ☐ You
- ☐ Your boss / line manager
- ☐ Another colleague
- ☐ An external organisation
- ☐ Other (please specify)

10. If you currently evaluate your projects, what form does this take?

- ☐ Participants reflecting on the session(s) as individuals
- ☐ Participants reflecting on the session(s) as a group
- ☐ You/ a colleague reflecting on the sessions(s)
- ☐ Other (please specify)

Evaluating environmental education questionnaire

11. What methods or tools have you used for evaluating your projects? (e.g. feedback questionnaire, drawings etc). If you haven't evaluated projects before, please write "not applicable".

12. If you don't usually evaluate your projects, what would encourage you to do so?

13. Do you think new tools to help you evaluate your projects would be useful?

- ◯ Yes
- ◯ No
- ◯ Don't know

Why is this?

14. What do you think would be the key features of an ideal evaluation method?

15. Thank you for taking the time to complete this questionnaire. Your responses will help develop new tools for evaluating environmental education projects. If you'd like more information about this work, or would like to be kept informed about the outcomes, then please leave your email address below, or call me on 01904 324577.

Appendix 2 - Information sheet and consent form

This letter is to invite you to take part in some research I am carrying out for my PhD as part of the OPAL project. I want to work with environmental educators such as you to develop better tools for evaluating the projects we do.

Evaluation of projects is important for a number of reasons, not least because it can help us demonstrate to our funders that the work we do is worth funding! Evaluation can provide us with feedback about which aspects of the project worked and which didn't work so well, allowing us to improve our practice. It can also reveal unexpected outcomes of projects and allow us to demonstrate progress over time.

Although evaluation is important, it often doesn't take place. This might be due to lack of time or resources, or maybe because user-friendly tools don't exist. This is where you come in! Together we can develop evaluation tools that are easy to use, practical and not too time consuming, and that don't require complex data analysis, but that still help us to demonstrate the value of our work to funders and improve our practice.

I'd like to invite you to a workshop with other environmental educators from the region. It will be a great opportunity for networking, as well as to exchange ideas about ways we could evaluate projects. This 2 hour workshop will be held in early Spring 2011, before the busy summer field season starts. At this workshop we will discuss any tools we already use to evaluate our projects and after the workshop I will provide you with copies of the tools we discussed. Then, if you wish, you can use some or all of the tools to evaluate your projects over the summer. In Autumn 2011 we will come back together for a second group workshop to discuss how we could improve the tools.

I plan to hold workshops in North, East, West and South Yorkshire, with each workshop having 5 or 6 environmental educators in it. If you are willing to take part, I would be very grateful if you could fill in and return the attached form to let me know your availability for January and February. If you know of any other environmental educators who might be willing to participate, please could you pass this letter onto them? If you've got questions about the research, just let me know.

Very best wishes,

Sarah West

OPAL Community Scientist
01904 434577
sarah.west@york.ac.uk

Stockholm Environment Institute, Environment Department, University of York, YO10 5DD

LOTTERY FUNDED

Name……
Organisation…….
Contact telephone number……
Email address……..

Which of the following locations would be most convenient for you? (Please cross out unsuitable locations)

York
Sheffield
Wakefield
Hull
Bradford
Harrogate
Leeds
Other (please detail)…….

Please could you circle on the calendar below the dates you are available for the workshop in the next few months. Alternatively, if you are returning this form by email, delete the dates you are not available.

		January		
Mon	**Tue**	**Wed**	**Thu**	**Fri**
24 am pm	25 am pm	26 am pm	27 am pm	28 am pm
31 am pm		**February**		
	1 am pm	2 am pm	3 am pm	4 am pm
7 am pm	8 am pm	9 am pm	10 am pm	11 am pm
14 am pm	15 am pm	16 am pm	17 am pm	18 am pm
21 am pm	22 am pm	23 am pm	24 am pm	25 am pm
28 am pm		**March**		
	1 am pm	2 am pm	3 am pm	4 am pm
7 am pm	8 am pm	9 am pm	10 am pm	11 am pm
14 am pm	15 am pm	16 am pm	17 am pm	18 am pm
21 am pm	22 am pm	23 am pm	24 am pm	25 am pm
28 am pm	29 am pm	30 am pm	31 am pm	

Evaluating Environmental Education Consent Form

Please tick appropriate boxes:

I have read and understood the project information sheet (dated February 2011) ☐

I have been given the opportunity to ask further questions about the project to date ☐

I agree I would like to take part in the project. ☐

I understand my taking part is voluntary and I can withdraw at anytime (although anything you have contributed to that point may still be used). ☐

A dictaphone will be used to record the workshops to ensure a true and accurate reflection of discussion

I agree to being recorded. ☐

Please tick one of the following three options:

I/my employer (delete which is not applicable) may be identified in reports made available outside the research team, and in publications. ☐

Neither I, nor my employer, may be identified in reports made available outside the research team, nor in any publications. My words may be quoted provided that they are anonymised. ☐

Neither I, nor my employer, may be identified in reports made available outside the research team, nor in any publications. My words may not be quoted. ☐

Photographs may be taken during workshops for use on the OPAL website and reports

I agree to have photographs taken. ☐

I understand that the information from the meeting will be sent to the OPAL data archive at the Natural History Museum ☐

Name of Participant	Signature	Date

Researcher	Signature	Date

Participant contact details (address, phone and/or email):

Appendix 3 - Participant questionnaire

This questionnaire is designed for use by people participating in environmental projects. It has been developed as part of the OPAL project, funded by the Big Lottery Fund to help inspire a new generation of nature lovers.

All answers will be kept anonymous and your details will not be passed onto anyone else. If you've got any questions or comments about this questionnaire please contact me via 01904 324577 or sarah.west@york.ac.uk

1. Which age category do you fit in?
   - ☐ Under 16
   - ☐ 16-24
   - ☐ 25-65
   - ☐ Over 65

2. How often do you take part in environmental projects?
   - ☐ Once a week
   - ☐ Once a month
   - ☐ Every 3 or 4 months
   - ☐ Once a year
   - ☐ Less often
   - ☐ This is my first time taking part
   - ☐ Other (please answer below)

3. What motivates you to take part in environmental projects?

4. What do you see as the benefits of taking part in environmental projects? This could be for you as an individual, for communities, or for societies. Please list any you can think of.

5. What do you think are the negative consequences of taking part in environmental projects? Please list any you can think of.

6. When taking part in environmental projects, what types of evaluation or feedback, if any, does your group leader ask you for? (for example, paper forms, comments at the end of the day)

7. How do you feel about giving feedback or evaluating projects in general?

Thank you for taking the time to complete this questionnaire. Your responses will help my research into the evaluation of environmental education. If you'd like more information about this work, or would like to be kept informed about the results, then please leave your email address below, or call Sarah West on 01904 324577.

OPAL EXPLORE NATURE

LOTTERY FUNDED

THE UNIVERSITY of York

Appendix 4 - Reflective diary

Reflection on the tool

Date(s):
Group worked with *(e.g. name of group, ages, number)*:

Have you worked with this group before?
If so, how often do you work with them?

Name of tool used / type of evaluation carried out:

How long did the evaluation process take?

Was the tool / evaluation easy to use?

How could it be improved? If you wish, attach the tool with annotations on how you think it should be improved.

How will the results from the evaluation impact your work? What changes, if any, will you make to your work based on this feedback?

Feel free to add any other comments

Appendix 5 - Codes

Code family name	Number of codes	Names of codes	Relevant chapter
Outcomes	39	Anecdote of lack of knowledge Appreciation of nature Awe and wonder Being outdoors Being part of a bigger picture Being part of nature Care for the environment Career in environment Community cohesion confidence, self-esteem Connection to place creativity imagination spirituality Exercise Filling time Freedom *(Sense of freedom)* Friendship Fun Hard to pick 5 key outcomes Health Improved behaviour towards environment improving curriculum Improving the environment Knowledge about the environment making a positive difference Meeting curriculum Negative being positive Negative outcome No negative outcome Personal achievement Positive attitude of practitioners Raising aspirations Reducing fears Resilience to change respect for nature Responsibility for nature Skills Social skills Transforming society Very specific outcome	2
Range of tools	5	Assumption of outcomes Different evaluation methods Lack of formal evaluation Tools not matching outcomes Value of comments section	3
Barriers and rationale	3	Ego boost Funding Problems with evaluation Problems with teachers Rationale for evaluation	4
Action research process	4	AR project Key features of evaluation Knowledge exchange Suggested improvements to tools	4 and 5

REFERENCES

Agyeman, J. (1998). Teaching Urban Nature at Key Stage 2 in England: looking at what is there, not at what ecologists say should be there. *Environmental Education Research*, *4*(2), 139–154.

Alaszewski, A. (2008). *Using Diaries for Social Research*. London: Sage.

Alexander, F. K. (2000). The changing face of accountability: Monitoring and assessing institutional performance in higher education. *Journal of Higher Education*, *71(4),* 411–431.

Alkin, M. C., & Taut, S. M. (2002). Unbundling evaluation use. *Studies in Educational Evaluation*, *29*(1), 1–12.

Ajiboye, J., & Silo, N. (2008). Enhancing Botswana children's environmental knowledge, attitudes and practices through the School Civic Clubs. *International Journal of Environmental and Science Education*, *3*(3), 105–114.

Allen, S. (2008). Tools, tips and common issues in evaluation experimental design choices. In A. Friedman (Ed.), *Framework for evaluating impacts of informal science education projects. Report from a National Science Foundation Workshop*. The National Science Foundation. Retrieved from http://insci.org/resources/Eval_Framework.pdf

Anderson, D. (2003). Visitors' Long-term Memories of World Expositions. *Curator: The Museum Journal*, *46*(4), 401–420.

Anfara, V. A., Brown, K. M., & Mangione, T. L. (2002). Qualitative Analysis on Stage: Making the Research Process More Public. *Educational Researcher*, *31*(7), 28–38.

Atkins, L., & Wallace, S. (2012). *Qualitative research in education*. London ; Los Angeles: Sage.

Atkinson, P. & Hammersley, M. (1998). *Ethnography and participant observation*. In N. K. Denzin & Lincoln Y. S (Eds.) *Strategies of qualitative inquiry.* (pp. 110-136) Thousand Oaks, CA: Sage

Ballantyne, R., & Packer, J. (2002). Nature-based Excursions: School Students' Perceptions of Learning in Natural Environments. *International Research in Geographical and Environmental Education*, *11*(3), 218–236.

Ballantyne, R., & Packer, J. (2005). Promoting environmentally sustainable attitudes and behaviour through free-choice learning experiences: what is the state of the game? *Environmental Education Research*, *11*(3), 281–295.

Ballantyne, R., Packer, J., & Everett, M. (2005). Measuring environmental education program impacts and learning in the field: using an action research cycle to develop a tool for use with young students. *Australian Journal of Environmental Education*, *21*, 23.

Bamberg, S., & Möser, G. (2007). Twenty years after Hines, Hungerford, and Tomera: A new meta-analysis of psycho-social determinants of pro-environmental behaviour. *Journal of Environmental Psychology*, *27*(1), 14–25.

Bamberger, M., Rugh, J., Church, M., & Fort, L. (2004). Shoestring Evaluation: Designing Impact Evaluations under Budget, Time and Data Constraints. *American Journal of Evaluation*, *25*(1), 5–37.

Bandoroff, S., & Scherer, D. G. (1994). Wilderness family therapy: An innovative treatment approach for problem youth. *Journal of Child and Family studies*, *3*(2), 175–191.

Barratt Hacking, E., Barratt, R., & Scott, W. (2007). Engaging children: research issues around participation and environmental learning. *Environmental Education Research*, *13*(4), 529–544.

Barton, J., & Pretty, J. (2010). What is the Best Dose of Nature and Green Exercise for Improving Mental Health? A Multi-Study Analysis. *Environmental Science & Technology*, *44*(10), 3947–3955.

Bell, S., Thompson, C. W., & Travlou, P. (2003). Contested views of freedom and control: children, teenagers and urban fringe woodlands in Central Scotland. *Urban Forestry & Urban Greening*, *2*(2), 87–100.

Berk, R., & Rossi, P. (1990). *Thinking about program evaluation*. Newbury Park, CA: Sage.

Bernard, H.R, & Ryan, G.W. (2010). *Analyzine qualitative data. Systematic approaches*, Thousand Oaks, CA: Sage

Bird, W. (2007). Natural Thinking. Investigating the links between the Natural Environment, Biodiversity and Mental Health. RSPB. Retrieved from http://www.rspb.org.uk/Images/naturalthinking_tcm9-161856.pdf

Bixler, R. D., & Floyd, M. F. (1997). Nature is Scary, Disgusting, and Uncomfortable. *Environment and Behavior*, *29*(4), 443–467.

Bixler, R. D., Floyd, M. F., & Hammitt, W. E. (2002). Environmental socialization quantitative tests of the childhood play hypothesis. *Environment and Behavior*, *34*(6), 795–818.

Blanchet-Cohen, N. (2008). Taking a stance: child agency across the dimensions of early adolescents' environmental involvement. *Environmental Education Research*, *14*(3), 257–272.

Bögeholz, S. (2006). Nature experience and its importance for environmental knowledge, values and action: recent German empirical contributions. *Environmental Education Research*, *12*(1), 65–84.

Bogner, F. X. (1999). Empirical evaluation of an educational conservation programme introduced in Swiss secondary schools. *International Journal of Science Education*, *21*(11), 1169–1185.

Bonney, R., Ballard, H., Jordan, R., McCallie, E., Phillips, T., Shirk, J., & Wilderman, C. C. (2009). Public Participation in Scientific Research: Defining the field and assessing its potential for informal science education. Retrieved from http://caise.insci.org/uploads/docs/PPSR%20report%20FINAL.pdf

Brossard, D., Lewenstein, B., & Bonney, R. (2005). Scientific knowledge and attitude change: The impact of a citizen science project. *International Journal of Science Education*, *27*(9), 1099–1121. Bryman, A. (2008). *Social Research Methods* (3rd ed.). Oxford: Oxford University Press.

Burgess, J., Harrison, C. M., & Limb, M. (1988). People, Parks and the Urban Green: A Study of Popular Meanings and Values for Open Spaces in the City. *Urban Studies*, *25*(6), 455–473.

Burningham, K., & Thrush, D. (2001). *Rainforests are a long way from here: the environmental concerns of disadvantaged groups*. Layerthorpe: YPS for the Joseph Rowntree Foundation.

Camargo, C., & Shavelson, R. (2009). Direct Measures in Environmental Education Evaluation: Behavioral Intentions versus Observable Actions. *Applied Environmental Education & Communication*, *8*(3-4), 165–173.

Carleton-Hug, A., & Hug, J. W. (2010). Challenges and opportunities for evaluating environmental education programs. *Evaluation and Program Planning*, *33*(2), 159–164.

Carlson, S. (2008). Environmental Field Days: Recommendations for Best Practices. *Applied Environmental Education & Communication*, *7*(3), 94–105.

Chapman, T., Bell, V., & Robinson, F. (n.d.). Measuring Impact : easy to say, hard to do. A think-piece to stimulate debate from the Third Sector Trends Study. Northern Rock Foundation Third Sector Trends Study. Retrieved from http://www.nr-foundation.org.uk/resources/third-sector-trends/publications/

Chatterji, M. (2005). Evidence on “What Works”: An Argument for Extended-Term Mixed-Method (ETMM) Evaluation Designs. *Educational Researcher*, *34*(5), 14–24.

Chatzifotiou, A. (2006). Environmental education, national curriculum and primary school teachers. Findings of a research study in England and possible implications upon education for sustainable development. *Curriculum Journal*, *17*(4), 367–381.

Chawla, L. (1998). Research Methods to Investigate Significant Life Experiences: review and recommendations. *Environmental Education Research*, *4*(4), 383–397.

Christie, C. A. (2003). What Guides Evaluation? A Study of How Evaluation Practice Maps onto Evaluation Theory. *New Directions for Evaluation*, *2003*, 7–36.

Clarke, A. (1999). *Evaluation Research: An Introduction to Principles, Methods and Practice*. London: Sage.

Connell, S., Fien, J., Lee, J., Sykes, H., & Yencken, D. (1999). If It Doesn't Directly Affect You, You Don't Think About It': a qualitative study of young people's environmental attitudes in two Australian cities. *Environmental Education Research*, *5*(1), 95–113.

Constas, M. A. (1992). Qualitative analysis as a public event: The documentation of category development procedures. *American Educational Research Journal*, *29*(2), 253–266.

Corbin, J. M., & Strauss, A. L. (2008). *Basics of qualitative research: techniques and procedures for developing grounded theory* (3rd ed.). Los Angeles, California: Sage Publications.

Corcoran, P. B. (1999). Formative Influences in the Lives of Environmental Educators in the United States. *Environmental Education Research*, *5*(2), 207–220.

Couvet, D., Jiguet, F., Julliard, R., Levrel, H., & Teyssedre, A. (2008). Enhancing citizen contributions to biodiversity science and public policy. *Interdisciplinary Science Reviews*, *33*(1), 95–103.

Crohn, K., & Birnbaum, M. (2010). Environmental education evaluation: Time to reflect, time for change. *Evaluation and Program Planning*, *33*, 155–158.

Davis, J. (1998). Young children, environmental education, and the future. *Early Childhood Education Journal*, *26*(2), 117–123.

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*(4), 379–392.

De Young, R. (1993). Changing Behavior and Making it Stick: The Conceptualization and Management of Conservation Behavior. *Environment and Behavior*, *25*(3), 485–505.

Department of Health. (2004). At least five a week. Evidence on the impact of physical activity and its relationship to health. A report from the Chief Medical Officer. Department of Health. Retrieved from http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4080981.pdf

Department for Education. (2013). 2014 National Curriculum - Schools. Retrieved from https://www.education.gov.uk/schools/teachingandlearning/curriculum/nationalcurriculum2014/

Dillon, J. (2003). On Learners and Learning in Environmental Education: Missing theories, ignored communities. *Environmental Education Research*, *9*(2), 215–226.

Driver, R., Asoko, H., Leach, J., Scott, P., & Mortimer, E. (1994). Constructing scientific knowledge in the classroom. *Educational Researcher*, *23*(7), 5–12.

Easton, P. A. (1996). Sharpening our tools. Improving evaluation in adult and nonformal education. UNESCO Institute for Education and Geman Foundation for International Development. Retrieved from http://unesdoc.unesco.org/images/0010/001099/109960eo.pdf

Eilam, E. & Trop, T. (2011). ESD Pedagogy: A guide for the perplexed, *Journal of Environmental Education*, 42(1), 43-64

Eiser, J. R. (1994). *Attitudes, chaos and the connectionist mind*. Malden: Blackwell Publishing.

Ellis, J., & Gregory, T. (2008). *Accountability and learning. Developing monitoring and evaluation in the third sector*. London: Charities Evaluation Service.

Evans, C., Abrams, E., Reitsma, R., Roux, K., Salmonsen, L., & Marra, P. P. (2005). The Neighborhood Nestwatch Program: Participant Outcomes of a Citizen-Science Ecological Research Project. *Conservation Biology*, *19*(3), 589–594.

Evans, G. W., Brauchle, G., Haq, A., Stecker, R., Wong, K., & Shapiro, E. (2007). Young Children's Environmental Attitudes and Behaviors. *Environment and Behavior*, *39*(5), 635–658.

Falk, J. H., Storksdieck, M., & Dierking, L. D. (2007). Investigating public science interest and understanding: evidence for the importance of free-choice learning. *Public Understanding of Science*, *16*(4), 455–469.

Falk, J., & Storksdieck, M. (2005). Using the contextual model of learning to understand visitor learning from a science center exhibition. *Science Education*, *89*(5), 744–778.

Falk, J.H, & Dierking, L. D. (2000). *Learning from Museums: Visitor Experiences and the Making of Meaning*. Plymouth: AltaMira Press.

Fetterman, D. M. (1988). Qualitative Approaches to Evaluating Education. *Educational Researcher*, *17*(8), 17–23.

Fielding, N. (1993). Ethnography. In N. Gilbert (Ed.), *Researching social life* (pp. 154–171). London: Sage.

Fien, J., Scott, W., & Tilbury, D. (2001). Education and Conservation: lessons from an evaluation. *Environmental Education Research*, *7*, 379–395.

Fien, J., Scott, W., & Tilbury, D. (2002). Exploring Principles of Good Practice: Learning from a Meta-Analysis of Case Studies on Education Within Conservation Across the WWF Network. *Applied Environmental Education and Communication*, *1*, 153–162.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: an introduction to theory and research*. Reading, Mass: Addison-Wesley Pub. Co.

Fitz-Gibbon, C. T., & Morris, L. L. (1987). *How to Design a Program Evaluation Volume 3* (2nd ed.). Thousand Oaks, California: Sage.

Fleming, L. M. (2009). *Environmental Education Professional Development needs and priorities study* (p. 108). Tuscon, Arizona: Research, Evaluation and Development Services.

Fleming, L. M., & Easton, J. (2010). Building environmental educators' evaluation capacity through distance education. *Evaluation and Program Planning*, *33*, 172–177.

Flick, U. (2006). *An introduction to qualitative research.* (3rd ed.). London: Sage.

Gayford, C. (2000). Biodiversity education: a teacher's perspective. *Environmental Education Research*, *6*(4), 347–361.

Gill, T. (2006). Growing Adventure. Final report to the Forestry Commission. Forestry Commission. Retrieved from http://www.forestry.gov.uk/pdf/fce-growing-adventure-report.pdf/$file/fce-growing-adventure-report.pdf

Gold, R. L. (1958).Roles in Sociological Field Research. *Social Forces, 36*(3), 217-223

Gough, S., Walker, K., & Scott, W. (2001). Lifelong learning: Towards a theory of practice for formal and non-formal environmental education and training. *Canadian Journal of Environmental Education (CJEE)*, *6*(1), 178–196.

Greene, J. C., Caracelli, V. J., & Graham, W. F. (1989). Toward a Conceptual Framework for Mixed-Method Evaluation Designs. *Educational Evaluation and Policy Analysis*, *11*(3), 255–274.

Greene, J. C. (2010). Serving the public good. *Evaluation and Program Planning*, *33*, 197–200.

Greenwood, D. J & Levin, M. (1998). *Introduction to Action Research. Social research for social change*. Thousand Oaks, CA: Sage.

Grieser, M. (2000). Participation. In B. A. Day & M. C. Monroe (Eds.), *Environmental education & communication for a sustainable world: handbook for international practitioners* (pp. 17–22). Washington, DC: Academy for Educational Development.

Gruenewald, D. A. & Manteaq, B. O. (2007). Oil and water still: how No Child Left Behind limits and distorts environmental education in US schools, *Environmental Education Research*, 13(2), 171-188

Guba, E. G. (1981). Criteria for Assessing the Trustworthiness of Naturalistic Inquiries. *Educational Communication and Technology*, 29(2), 75–91.

Guba, E. G & Lincoln, Y. S. (1989) *Fourth generation evaluation*. Newbury Park, CA: Sage

Hart, P. (2007). Environmental education. In S. K. Abell & N. G. Lederman (Eds.), *Handbook of Research on Science Education* (pp. 689–726). Mahwah, New Jersey: Lawrence Erlbaum.

Hattie, J., Marsh, H. W., Neill, J. T., & Richards, G. E. (1997). Adventure Education and Outward Bound: Out-of-Class Experiences That Make a Lasting Difference. *Review of Educational Research*, *67*(1), 43–87.

Heimlich, J. E. (2010). Environmental education evaluation: Reinterpreting education as a strategy for meeting mission. *Evaluation and Program Planning*, *33*, 180–185.

Hein, G. E. (1998). *Learning in the Museum*. London: Routledge.

Henry, G. T., & Mark, M. M. (2003). Toward an Agenda for Research on Evaluation. *New Directions in Evaluation*, *97*, 69–80.

Hernandez, O. (2000). Evaluation. In B. A. Day & M. C. Monroe (Eds.), *Environmental education & communication for a sustainable world: handbook for international practitioners* (pp. 61–66). Washington, DC: Academy for Educational Development.

Hernandez, O., & Monroe, M. C. (2000). Thinking about behavior. In B. A. Day & M. C. Monroe (Eds.), *Environmental education & communication for a sustainable world: handbook for international practitioners* (pp. 7–16). Washington, DC: Academy for Educational Development.

Hindson, J., & Carter, L. (n.d.). *Natural history societies and recording schemes in the UK: A consultation into the factors that limit their functioning and development* (p. 20). London: Natural History Museum. Retrieved from http://www.opalexplorenature.org/sites/default/files/7/file/Consultation-report.pdf

Hines, J. M., Hungerford, H. R., & Tomera, A. N. (1986). Analysis & Synthesis of Research on Responsible Env Behavior.pdf. *Journal of Environmental Education*, *18*(2), 1–8.

Hofstein, A., & Rosenfeld, S. (1996). Bridging the gap between formal and informal learning. *Studies in Science Education*, *28*, 87–112.

Hooper-Greenhill, E., Dodd, J., Moussouri, T., Jones, C., Pickford, C., Herman, C., … Toon, R. (2003). *Measuring the outcomes and impact of learning in museums archives and libraries* (p. 24). Research Centre for Museums and Galleries.

House, E. R. (2005). Qualitative evaluation and changing social policy. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage handbook of Qualitative Research* (3rd ed., Vols. 1-1, Vol. 1, pp. 1069–1081). Thousand Oaks, California: Sage.

Hungerford, H. R., & Volk, T. L. (1990). Changing learner behavior through environmental education. *Journal of Environmental Education*, *21*(3), 8–22.

IPCC. (2007). *IPCC Fourth Assessment Report: Climate Change 2007* (Summary for Policymakers). Retrieved from http://www.ipcc.ch/publications_and_data/ar4/syr/en/spms1.html

IUCN. (1970). *International workshop on environmental education in the school curriculum. Final report*. Gland, Switzerland: IUCN.

Jacobson, S. K., & McDuff, M. D. (1997). Success factors and evaluation in conservation education programmes. *International Research in Geographical and Environmental Education*, *6*(3), 204–221.

Jensen, B. B. (2002). Knowledge, Action and Pro-environmental Behaviour. *Environmental Education Research*, *8*(3), 325–334.

Jickling, B & Wals, A. E. J. (2008). Globalization and environmental education: looking beyond sustainable development. *Journal of Curriculum Studies,* 40(1), 1-21

Kaplan, R. (1993). The role of nature in the context of the workplace. *Landscape and urban planning*, *26*(1), 193–201.

Khalil, K., & Ardoin, N. (2011). Programmatic Evaluation in Association of Zoos and Aquariums–Accredited Zoos and Aquariums: A Literature Review. *Applied Environmental Education & Communication*, *10*(3), 168–177.

Kirkpatrick, D. (1996). Great ideas revisited. *Training & Development*, *50*, 54.

Kleiman, D. G., Reading, R. P., Miller, B. J., Clark, T. W., Scott, J. M., Robinson, J., … Felleman, F. (2000). Improving the Evaluation of Conservation Programs. *Conservation Biology*, *14*(2), 356–365.

Kollmuss, A., & Agyeman, J. (2002). Mind the Gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research*, *8*(3), 239–260.

Kuhar, C. W., Bettinger, T. L., Lehnhardt, K., Townsend, S., & Cox, D. (2007). Into the Forest: The Evolution of a Conservation Education Program at Kalinzu Forest Reserve, Uganda. *Applied Environmental Education & Communication*, *6*(2), 159–166.

Kundin, D. M. (2010). A Conceptual Framework for How Evaluators Make Everyday Practice Decisions. *American Journal of Evaluation*, *31*, 347–362.

Lawrenz, F. (2007). Review of science education program evaluation. In S. K. Abell & N. G. Lederman (Eds.), *Handbook of Research on Science Education* (pp. 943–963). Taylor & Francis.

Leviton, L. C. (2003). Evaluation Use: Advances, Challenges and Applications. *American Journal of Evaluation*, *24*, 525–535.

Macnaghten, P. (1995). Public attitudes to countryside leisure: a case study on ambivalence. *Journal of Rural Studies*, *11*(2), 135–147.

Maller, C. (2005). Healthy nature healthy people: "contact with nature" as an upstream health promotion intervention for populations. *Health Promotion International*, *21*(1), 45–54.

McDuff, M. (2002). Needs Assessment for Participatory Evaluation of Environmental Education Programs. *Applied Environmental Education & Communication*, *1*(1), 25–36.

McFarlane, H., & Hansen, N. (2007). Inclusive methodologies: Including disablsed people in participatory action research in Scotland and Canada. In S. Kindon, R. Pain, & M. Kesby (Eds.), *Participatory Action Research approaches and methods: Connecting people, participation and place* (pp. 88–94). Abingdon: Routledge.

McKenzie-Mohr, D., Nemiroff, L. S., Beers, L., & Desmarais, S. (1995). Determinants of responsible environmental behavior. *Journal of Social Issues*, *51*(4), 139–156.

McKenzie-Mohr, D., & Smith, W. (1999). *Fostering sustainable behavior*. Gabriola Island, BC: New Society Publishers.

McNaught, C., & Lam, P. (2010). Using Wordle as a supplementary research tool. *The qualitative report*, *15*(3), 630–643.

Meth, P. (2003). Entries and omissions: using solicited diaries in geographical research. *Area*, *35*(2), 195–205.

Mind. (2007). *Ecotherapy. The green agenda for mental health* (p. 36). Mind. Retrieved from http://www.mind.org.uk/assets/0000/2138/ecotherapy_report.pdf

Mitchell, J. C. (1983). Case and situation analysis. *The Sociological Review*, *31*(2), 187–211.

Monroe, M. C. (2010). Challenges for environmental education evaluation. *Evaluation and Program Planning*, *33*, 194–196.

Monroe, M. C., Day, B. A., & Grieser, M. (2000). GreenCOM weaves four strands. In B. A. Day & M. C. Monroe (Eds.), *Environmental education & communication for a sustainable world: handbook for international practitioners* (pp. 3–6). Washington, DC: Academy for Educational Development.

Monroe, M. C., Fleming, M. L., Bowman, R. A., Zimmer, J. F., Marcinkowski, T., Washburn, J., & Mitchell, N. J. (2005). Evaluators as educators: Articulating program theory and building evaluation capacity. *New Directions for Evaluation*, *2005*, 57–71.

NAEE. (2013, May 7). Curriculum Review. *National Association for Environmental Education UK*. Retrieved August 13, 2013, from http://www.naee.org.uk/Curriculum%20Review

National STEM Centre. (2009). Does it work? Better evaluation: better STEM. National STEM Centre. Retrieved from http://www.nationalstemcentre.org.uk/res/documents/page/STEM%20-%20Does%20it%20work.pdf

Newell, R. (1993). Questionnaires. In N. Gilbert (Ed.), *Researching social life* (pp. 94–115). London: Sage.

Norland, E. (2005). The nuances of being “non”: Evaluating nonformal education programs and settings. *New Directions for Evaluation*, *2005*(108), 5–12.

O’Neill, E. (2007). *Conservation audits: Auditing the conservation process. Lessons learned 2003-2007*. Conservation Measures Partnership. Retrieved from http://www.conservationmeasures.org/wp-content/uploads/2010/04/Conservation_Audits_FINAL_DRAFT_31_July_2007.pdf

Olsen, M. E. (1981). Consumers’ attitudes toward energy conservation. *Journal of Social Issues*, *37*(2), 108–131.

OPAL. (n.d.). About OPAL | OPAL. Retrieved August 13, 2013, from http://www.opalexplorenature.org/aboutOPAL

Orams, M. B. (1997). The effectiveness of environmental education: can we turn tourists into’Greenies’? *Progress in tourism and hospitality research*, *3*, 295–306.

Palmer, J. (1998). *Environmental Education in the 21st Century: Theory, Practice, Progress and Promise*. Routledge.

Palmer, J. A. (1999). Research Matters: a call for the application of empirical evidence to the task of improving the quality and impact of environmental education. *Cambridge Journal of Education*, *29*(3), 379–395.

Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks, California: Sage Publications.

Powell, R. B., Stern, M. J., & Ardoin, N. (2006). A Sustainable Evaluation Framework and Its Application. *Applied Environmental Education & Communication*, *5*(4), 231–241.

Pretty, J., Angus, C., Bain, M., Barton, J., Gladwell, V., Hine, R., … Sellens, M. (2009). Nature, childhood, health and life pathways. *Occasional Paper*, *2*. Retrieved from http://www.hphpcentral.com/wp-content/uploads/2010/10/Nature-Childhood-and-Health-iCES-Occ-Paper-2009-2-FINAL.pdf

Puchta, C. & Potter, J. (2004), *Focus group practice*, London: Sage Publications.

RCUK. (2005). Evaluation: Practical Guidelines. Research Councils UK. Retrieved from http://www.rcuk.ac.uk/documents/publications/evaluationguide.pdf

Reid, A., & Scott, W. (2006). Researching education and the environment: retrospect and prospect. *Environmental Education Research*, *12*(3-4), 571–587.

Rickinson, M. (2001). Learners and Learning in Environmental Education: A critical review of the evidence. *Environmental Education Research*, *7*(3), 207–320.

Rickinson, M., Dillon, J., Teamey, K., Morris, M., Young Choi, M., Saunders, D., & Benefield, P. (2004). *A review of research on outdoor learning*. London: National Foundation for Educational Research and Kings College London.

Rose, G. (1982). *Deciphering sociological research*. Basingstoke, UK: Macmillan Education

Rossi, P. H., Freeman, H. E., & Lipsey, M. W. (2004). *Evaluation: a systematic approach* (7th ed.). Thousand Oaks, California: Sage.

Rovira, M. (2000). Evaluating Environmental Education Programmes: Some issues and problems. *Environmental Education Research*, *6*(2), 143–155.

Rowe, G., Horlick-Jones, T., Walls, J., Poortinga, W., & Pidgeon, N. F. (2008). Analysis of a normative framework for evaluating public engagement exercises: reliability, validity and limitations. *Public Understanding of Science*, *17*(4), 419–441.

Rowe, G., & Frewer, L. J. (2004). Evaluating Public-Participation Exercises: A Research Agenda. *Science, Technology, & Human Values*, *29*(4), 512–557.

Ryan, G. W., & Bernard, H. R. (2003). Techniques to Identify Themes. *Field Methods*, *15*(1), 85–109.

Ryan, R. L., Kaplan, R., & Grese, R. E. (2001). Predicting volunteer commitment in environmental stewardship programmes. *Journal of Environmental Planning and Management*, *44*(5), 629–648.

Schalock, R. L. (2001). *Outcome-based evaluation*. New York: Kluwer Academic/Plenum Publishers.

Schauble, L., Beane, D. B., Coates, G. D., Martin, L. M. W., & Sterling, P. V. (1996). Outside the classroom walls: learning in informal environments. In L. Schauble & R. Glaser (Eds.), *Innovations in learning: new environments for education* (pp. 5–24). Mahwah, New Jersey: L. Erlbaum Associates.

Schusler, T. M., Krasny, M. E., Peters, S. J., & Decker, D. J. (2009). Developing citizens and communities through youth environmental action. *Environmental Education Research*, *15*(1), 111–127.

Scott, P., Asoko, H., & Leach, J. (2007). Student conceptions and conceptual learning in science. In S. K. Abell & N. G. Lederman (Eds.), *Handbook of Research on Science Education* (pp. 31–56). Taylor & Francis.

Select Committee on Science and Technology. (2002). *What on Earth? The threat to the science underpinning conservation* (No. 3, Session 2001-02). London: House of Lords. Retrieved from http://www.parliament.the-stationery-office.co.uk/pa/ld200102/ldselect/ldsctech/118/11802.htm

Shadish, W. R., Cook, T. D., & Leviton, L. C. (1991). *Foundations of Program Evaluation: Theories of practice*. Newbury Park, CA: Sage.

Shaw, I., & Faulkner, A. (2006). Practitioner Evaluation at Work. *American Journal of Evaluation*, *27*, 44–63.

Siddique, H. (2013, April 14). Plans to drop climate debate from national curriculum “unacceptable.” *The Guardian*. Retrieved from http://www.theguardian.com/environment/2013/apr/14/plans-drop-climate-change-curriculum

Silverman, D. (2006). *Interpreting qualitative data*. 3rd edition. London: Sage.

Smith, N. L. (1993). Improving Evaluation Theory Through The Empirical Study of Evaluation Practice. *American Journal of Evaluation*, *14*, 237–242.

Smyth, J. C. (1995). Environment and Education: a view of a changing scene. *Environmental Education Research*, *1*(1), 3–120.

Spencer, B. J., & Couture, J.-C. (2009). Introduction. In K. D. Gariepy, B. J. Spencer, & J.-C. Couture (Eds.), *Educational Accountability: Professional Voices from the Field*. Rotterdam: Sense Publishers. Retrieved from http://books.google.co.uk/books?id=3eBiPgAACAAJ

Spencer, L. (2003). *Quality in Qualitative Evaluation: A framework for assessing research evidence*. Government Chief Social Researcher's Office, Cabinet Office. Retrieved from http://collections-r.europarchive.org/tna/20070705130742/http://www.policyhub.gov.uk/docs/qqe_rep.pdf

Stern, M. J., Powell, R. B., & Ardoin, N. M. (2008). What Difference Does It Make? Assessing Outcomes From Participation in a Residential Environmental Education Program. The Journal of Environmental Education, 39(4), 31–43.

Stern, P. C. (2000). New environmental theories: toward a coherent theory of environmentally significant behavior. *Journal of Social Issues*, *56*(3), 407–424.

Stern, P. C., Dietz, T., Abel, T., Guagnano, G. A., & Kalof, L. (1999). A value-belief-norm theory of support for social movements: The case of environmentalism. *Human Ecology Review*, *6*(2), 81–98.

Stevenson, R. B. (1987). Schooling and environmental education: contradictions in purpose and practice. In I. Robottom (Ed.) *Environmental Education: practice and possibility*. Geelong, Victoria: Deakin University Press.

Stevenson, R. B. (2007). Schooling and environmental/sustainability education: from discources of policy and practice to discourses of professional learning. *Environmental Education Research,* 13(2), 265-285

Stokking, K. M., van Aert, L., Meijberg, W., & Kaskens, A. (1999). *Evaluating environmental education*. Gland; Cambridge: Commission on Education and Communication, IUCN.

Storksdieck, M., Ellenbogen, K., & Heimlich, J. E. (2005). Changing minds? Reassessing outcomes in free-choice environmental education. *Environmental Education Research*, *11*(3), 353–369.

Stufflebeam, D. L., Madaus, G. F., & Kellaghan, T. (2000). *Evaluation Models: Viewpoints on Educational and Human Services Evaluation* (2nd ed.). Boston: Kluwer Academic Publishers.

Sustainable Development Commission. (2008). *Health, place and nature. How outdoor environments influence health and well-being: a knowledge base*. Retrieved from http://www.sd-commission.org.uk/data/files/publications/Outdoor_environments_and_health.pdf

Sward, L. L. (1999). Significant Life Experiences Affecting the Environmental Sensitivity of El Salvadoran Environmental Professionals. *Environmental Education Research*, *5*(2), 201–206.

Taff, M. A. M., Boyes, M., & Maxted, J. (2007). A Residential Outdoor Education Camp and Environmental Attitudes: A Case Study. Presented at the Australian National Outdoor Education Conference, Ballarat, Melbourne, Australia. Retrieved from http://www.freewebs.com/outdoorasia/Microsoft%20Word%20-%20artivle%20for%20australia%20conference%202.7.2007%20journal%20de.pdf

Taut, S. M., & Alkin, M. C. (2003). Program Staff Perceptions of Barriers to Evaluation Implementation. *American Journal of Evaluation*, *24*, 213–226.

Taylor, E. W. (2006). Making Meaning of Local Nonformal Education: Practitioner's Perspective. *Adult Education Quarterly*, *56*(4), 291–307.

Tilbury, D. (1995). Environmental Education for Sustainability: defining the new focus of environmental education in the 1990s. *Environmental Education Research, 1 (2), 195-212*

Tourmen, C. (2009). Evaluators' Decision Making: The Relationship Between Theory, Practice, and Experience. *American Journal of Evaluation*, *30*, 7–30.

Trumbull, D., Bonney, R., Bascom, D., & Cabral, A. (2000). Thinking scientifically during participation in a citizen-science project. *Science Education*, *84*(2), 265–275.

Ulrich, R. S. (1984). View through a window may influence recovery from surgery. *Science*, *224*(4647), 420–421.

Unesco. (1977). *Intergovernmental conference on Environmental Education Final Report* (p. 96). Tbilisi.

Ungar, M., Dumond, C., & McDonald, W. (2005). Risk, Resilience and Outdoor Programmes for At-risk Children. *Journal of Social Work*, *5*(3), 319–338.

Van Den Berg, H. A., Dann, S. L., & Dirkx, J. M. (2009). Motivations of Adults for Non-Formal Conservation Education and Volunteerism: Implications for Programming. *Applied Environmental Education & Communication*, *8*(1), 6–17.

Vaughan, C., Gack, J., Solorazano, H., & Ray, R. (2003). The Effect of Environmental Education on Schoolchildren, Their Parents, and Community Members: A Study of Intergenerational and Intercommunity Learning. *The Journal of Environmental Education*, *34*(3), 12–21.

Wals, A. E., & Leij, T. van der. (1997). Alternatives to national standards for environmental education: Process-based quality assessment. *Canadian Journal of Environmental Education (CJEE)*, *2*(1), 7-28

Ward Thompson, C., Aspinall, P., Bell, S., & Findlay, C. (2005). “It Gets You Away From Everyday Life”: Local Woodlands and Community Use—What Makes a Difference? *Landscape Research*, *30*(1), 109–146.

Wenger, E. (2009). A social theory of learning. In K. Illeris (Ed.), *Contemporary theories of learning: Learning theorists...in their own words* (pp. 209–218). London: Routledge.

Werquin, P., & Organisation for Economic Co-operation and Development. (2010). *Recognising non-formal and informal learning outcomes, policies and practices*. Paris: OECD. Retrieved from http://dx.doi.org/10.1787/9789264063853-en

Whitehall, A. K., Hill, L. G., & Koehler, C. R. (2012). A Comparison of Participant and Practitioner Beliefs About Evaluation. *American Journal of Evaluation*, *33*, 208–220.

Whitmarsh, L. (2011). Scepticism and uncertainty about climate change: Dimensions, determinants and change over time. *Global Environmental Change*, *21*(2), 690–700.

Wicker, A. W. (1969). Attitudes versus actions: The relationship of verbal and overt behavioral responses to attitude objects. *Journal of Social Issues*, *25*(4), 41–78.

Wilhelm, S. A., & Schneider, I. E. (2005). Diverse Urban Youth’s Nature: Implications for Environmental Education. *Applied Environmental Education & Communication*, *4*(2), 103–113.

Wilson, E. O. (2003). The encyclopedia of life. *Trends in Ecology & Evolution*, *18*(2), 77–80.

Zint, M. T., Dowd, P. F., & Covitt, B. A. (2011a). Enhancing environmental educators’ evaluation competencies: insights from an examination of the effectiveness of the My Environmental Education Evaluation Resource Assistant (MEERA) website. *Environmental Education Research*, *17*(4), 471–497.

Zint, M. T., Covitt, B. A., & Dowd, P. F. (2011b). Insights From an Evaluability Assessment of the U.S. Forest Service More Kids in the Woods Initiative. The Journal of Environmental Education, 42(4), 255–271.

Zint, M. T. (2012) Advancing environmental education program evaluation: Insights from a review of behavioural outcome evaluations. *In International handbook of research in environmental education*, eds Stephenson, R. Brody, M., Dillon, J., and Wals, A. New York, NY: Routledge.