‘An Investigation Into Bridging Formal and Informal Education in Schools.’

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Abstract

Much educational research has focused on schools in order to understand student learning. However, the important roles that informal learning and field trips have on a student's educational journey are also vital to understand. Effectively bridging formal classroom-based education with the benefits of outdoor informal learning may greatly enhance the students overall educational experience. This project explores the issues surrounding the bridging of formal and informal education at a Scottish national park. Issues were investigated through a review of the current academic literature as well as qualitative data collection involving semi-structured interviews with park educational staff and visiting teachers. The project found that field parties visited the park for many social and educational reasons, which were not mutually exclusive. Field trips were perceived to encourage students through exercising, hearing differing teaching voices, experiencing different teaching styles, and also to embolden pupils to study the subject further. Park field trip structures varied depending on the activity and organiser. There is no standard park educational programme and no joint education strategy for Scotland's two national parks. The investigation was carried out a time of great change in the formal Scottish education system. The new curriculum was found to be more favourable to informal learning than the previous arrangements. It was also found that many informal educational activities running at the park met formal curricular goals. There was a willingness amongst park staff to organise activities to meet new curricular goals and to embrace new technologies and activities. There are some logistic, behavioural and physical problems, which are currently limiting the degree to which the national park can assist in the bridging of formal and informal education. Transport issues, local facility availability and the requirement of staff to simultaneously pursue other non-educational aims were problems found during the investigation. The park was found to possess many organisational strengths, strong educational attractions and have enthusiastic, flexible and approachable staff. The project found that there was perceived to be a new drive to increase student exposure to informal education. Bridging formal and informal education is possible in Scotland and was found to be present at the national park. However, it currently relies heavily on the work of a few dedicated individuals, and is not yet viewed as a governmental educational priority.

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Introduction

"They say that we are better educated than our parents' generation. What they mean is that we go to school for longer. It is not the same thing." -- Richard Yates

Education is the key to understanding our world around us. A successful education helps transfer to students the knowledge of previous generations and instils the ability within the student to utilize this accumulation of knowledge to face the challenges of the future. A person's education is formed through a combination of their academic, social and personal experiences which blend together to affect the way they understand both their surroundings and their own condition.

A quality education brings great benefits for a person individually and also for society as a whole. A person's level of education affects their employment possibilities, their understanding of health related issues, how they see themselves in society and how they interact with the world around them. According to a recent 2007 OECD report Scotland has one of the most equitable and best performing education systems in the OECD. However, the report also found some serious problems with our education system that need to be rapidly addressed if Scotland is to maintain its advantages. Some issues highlighted by the report include the opening up of a gap in educational achievement beginning in primary education and widening throughout junior secondary years. This was found to be particularly the case in regards to children from poorer backgrounds who having fallen behind in primary school continued to under perform into secondary education. A further concern is the increasing number of young people leaving school with minimal qualifications. The report also found this to be particularly the case among students from lower socio-economic backgrounds.

A suggestion from the report to address these issues was the idea of further integration between the various parties involved in Scottish educational at both a national and local level. By increasing the communication and dialogue between the various parties involved in Scottish education it will become easier to share ideas and support for pupils or areas that are struggling and direct resources towards the areas that need it most. However a point missed from the OECD report and from most governmental reports is the important role that education from outside the classroom can play in a child's development.

Findings by Medrich et al., (1982) found that 85% of the time that children are awake is spent out of the classroom. As student learning doesn't cease the moment they leave the classroom it is vital to consider educational influences from outside the classroom as well as within. In order to maintain and even improve Scotland educational standards any political will towards an increase in dialogue between parties interested in Scottish education should also include informal educational parties who are from outside of government and local authorities. Informal learning sites in Scotland such as our museums, national parks, science centres and historic locations are visited by thousands of young people annually. If the educational programmes of these locations can support the work students are performing in the classroom while still teaching about the locations individual importance then this integrated educational approach will help reinforce curricular goals while placing them in a real world Scottish context. Further than that there is a large body of research suggesting that informal learning settings are extremely important learning situations for conveying certain kinds of cognitive and affective science information to students (Falk Koran and Dierking 1986), for creating positive attitudes towards subject areas (Dillon et al 2006; Bogner 1998 ;Orion et al 1996; Eshach 2006; Jarvis and Pells' 2002) and that as well as helping to enriching the repertoire of learning opportunities for Scottish students if informal and formal learning can be bridged successfully then the variety of choices it allows our students can help relate pupils' educational experiences to their everyday life as well as meet the challenge of a quality education for all.

1.1 Informal, Formal or Non-formal?

Scotland posses a wealth of locations that can inspire, challenge and provide unique examples of educational concepts in a real world setting. If Scotland is to continue to produce great thinkers and a population able to deal with the challenges of the future it will only come through effective education and the mobilization of all our educational assets both within the classroom and outside it. By ensuring that learning outside of the classroom is as effective as learning within it, Scotland's teachers and pupils will have the freedom to experience the many advantages of our educational attractions without losing out on educational attainment. To answer the OECD report's questions, as well as the challenges of the future, it is imperative to have an understanding of a comprehensive education strategy that includes a mixture of the traditional formal education that has served Scotland well in the past, as well as support from important new findings in the area of informal education.

However there is a large area of debate as to what exactly defines and constitutes the terminology of formal, informal and non-formal education. Part of this project will explore the debate surrounding this area both in regards to the work carried out for the project and in the larger academic context. For simplicity during this project the term formal education – unless otherwise stated - will refer to all educational work which happens within school buildings and is focused on the Scottish educational curriculum. Informal education will refer to all educational work physically outside of school buildings and in the context of this project will generally refer to work carried out at Loch Lomond and Trossachs national park. Informal education is not necessarily tied to or originates from a standard national curriculum. From academic research non-formal education put simply refers to educational work carried out by voluntary organisations such as Scout or Guides. As this project is dealing with the bridging of learning from school field trips with class based teaching the term nonformal will be little used with student learning attributed to the outdoor work at Loch Lomond termed informal learning.

1.2 Project Location

Children are naturally curious about the world around them. The challenge for Scottish educators is to nurture and develop our children's natural interest in their surroundings throughout their childhood and beyond. Informal education is a growing area of education theory that I believe has much to offer the Scottish education system. Scotland has a wealth of world-class museums; science centres and areas of scientific interest and an effective utilization of these places would be an enormous boon to both pupils and educators. Research has suggested that informal education at these locations, if performed correctly, could greatly enhanced curricular learning Falk (1983). However as far as the author is aware there are few of these studies performed in a Scottish context. An aim of the project is to test the ideas of modern educational research regarding informal learning in a specifically Scottish setting. Another important aspect of this project is to discover what the current situation is regarding informal education in Scotland. This will be performed through a case study performed at Loch Lomond.

To maintain Scotland's high educational standard it is important to make the most of Scotland education resources. Scotland has many educational sites; however it is far beyond the ability of the project to investigate them individually. Consequently for the project a case study was performed on a popular informal education site from which it would be possible to investigate many of the issues surrounding the bridging of informal and formal learning. Loch Lomond and Trossachs national park is one of only two national parks in Scotland and is an area of outstanding natural beauty. The park possesses a diversity of landscapes, habitats and communities and is roughly within an hour's drive from the central belt of Scotland, home to the majority of the country's population. The national park is a popular destination for educators wishing to organise a field trip to explore many aspects of the park and to sample its unique attractions. Due its size (~720 sq miles) Loch Lomond and Trossachs national park possesses a large variety of attractions for visiting school parties with sites of social, cultural, physical and scientific interest. The park describes itself as "an ideal outdoor classroom that offers fantastic opportunities for learning, first hand experiences and most importantly…fun" (Loch Lomond and Trossachs national park website). The national park information website states that the park provides a wealth of support for teachers wishing to visit the park for educational purposes and during its creation in 2002 one of its four aims of the park was

listed as, "to promote understanding and enjoyment (including enjoyment in the form of recreation) of the special qualities of the area by the public". In order to pursue the aim of promoting understanding an educational service within the park has evolved which provides both online and material support to visiting educators and school parties as well as the provision of support staff – where appropriate – to assist with learning within the park.

The educational support system within the park evolved independently from the Scottish school system and so it forms a useful example of the development of an informal learning organization within a Scottish context. By investigating how well Loch Lomond and Trossachs national park's own informal educational programme supports the requirements of visiting schools parties with their formal curricular concerns it will be possible for this project to evaluate how easy it is to bridge formal and informal learning in the of context outdoor education within the park. In addition to this, by using Loch Lomond and Trossachs national park as a case study, this project will be able to discover many of the general issues facing those participating in informal education in Scotland. This will allow findings from this report to help other popular informal educational destinations across the country.

1.3 Project Aims

In order to address the project's question of how do we bridge informal and formal learning at Loch Lomond and Trossachs national park it is important to answer the following questions:

- Why are teachers and school parties visiting the park's informal learning environment?
- When the field parties are at the park what are the variables that affect learning?
- How are field trips to the park structured?
- How is knowledge attained on a field trip?
- How does the informal learning facilitated at the park connect with the new Curriculum for Excellence?

- What are the strengths and problems regarding informal learning at Loch Lomond and Trossachs national park?

The reason for investigating the aforementioned questions is that by answering each of these questions - through the data collected at the national park and within the literature review - it was then possible to evaluate the current situation regarding informal education. Once this was known then suggestions were made in the discussion and summary sections of the report about how this work can be best integrated with formal classroom work to produce an integrated and comprehensive learning experience that makes the most of both Scotland's formal education system and its informal learning locations.

Having listed the aims of the project and briefly their importance it is now valuable to look in more detail at the individual questions and how answering them helped elucidate some of the larger issues regarding the Scottish education system.

In order to form an evaluation of the current state of informal education at Loch Lomond and Trossachs national park it was important to discover why school teachers and educational parties were visiting the park. By conducting research into the academic literature surrounding field trips the various reasons for leaving the classroom were investigated. By comparing and contrasting reasons found in the literature review with those given by visitors to the park it was then possible to deduce the strengths of informal learning at Loch Lomond and Trossachs national park and what draws teachers to visit. Through investigating the factors that influence visitors to come to the national park it was possible to evaluate the potential of the formal Scottish Education system to 'connect' with such resources. It was also useful to analyse the beliefs of the educators interviewed for this project in regards to whether they feel they are supported in organising outdoor learning and whether they feel its is beneficial for themselves and their students.

The second question, regarding the variables that affect learning whilst at the park, was important for the project in allowing the investigation to judge what are site specific issues regarding informal learning and

what are issues which could affect educators in other informal learning situations beyond Loch Lomond. By investigating what variables affect learning on a field trip it was then possible to suggest methods that deal with these problems and therefore make the bridging of formal and informal education easier.

Through investigating how field trips to the park are structured in regards to the information from both the academic literature and the data collected at Loch Lomond it was useful to discover how park educators and visiting teachers are dealing with the variables which can affect levels of educational attainment on a field trip. Looking at the structure of field trips answers this. It was also helpful in highlighting what educators feel are important priorities on a field trip as well as gauging the practicalities of outdoor learning at Loch Lomond and with informal learning in general.

Focusing on how knowledge is attained on a field trip helped answer the question of how to bridge formal and informal learning by discovering the different ways that people learn outdoors compared with within a classroom. Different people learn in different ways and consequently some respond better to formal learning with its emphasis on passive learning than others. Inversely other students find passive learning difficult and standard practices of the classroom restraining (Hofstien & Rosenfeld 1996). By discovering educators' thoughts on how students are benefiting in each environment it will allow teachers to tailor their teaching styles more towards the practices which best benefit the individual student allowing for a more student centred approach to education.

During the running of the project the formal Scottish education system was in a state of flux owing to the introduction of the controversial new 'Curriculum for Excellence' (Learning and Teaching Scotland Website). The new curriculum replaces the previous 5 -14 syllabus and incorporates findings from the OECD 2007 report alongside others. The new curriculum constitutes a governmental drive towards greater emphasis on cross-curricular learning and a drive to address the 4 capabilities: 'Successful Learners, Confident Individuals, Responsible Citizens and Effective Contributors'. Where appropriate the project addresses how the informal education at Loch Lomond relates to this new curriculum and how easy it is to bridge the informal learning at the park with the new ideas in the formal curriculum. General issues

regarding the implementation of the new curriculum were also looked at in regards to the context of informal learning and its impact on popular excursion sites such as Loch Lomond.

The final question of 'What are the strengths and problems regarding informal learning at Loch Lomond and Trossachs national park' allowed for an assessment of how easy it is to bridge informal learning at the park with formal curricular work. By investigating the strengths mentioned by educators regarding the park it highlighted positive points within the field of informal learning both in general and in the park specifically. By noting and where possible addressing the problems facing informal education at Loch Lomond it was then possible to raise issues that prevent the effective bridging of informal and formal learning.

The issue of bridging formal and informal education is a complex matter with variables depending on everything from the individual educator performing the trip, government policy, the physical location of the trip and even the weather on the day of the trip. In Scotland the issue is further hampered by a lack of academic literature on the subject matter. Whilst there is a relatively large amount of academic literature internationally regarding the subject area of informal learning much of the research comes from Australia and North America. Due to vast differences in scale, and many of the physical and political issues, this research is not always useful in a Scottish setting. Therefore an important part of this project is investigating the informal educational situation on the ground at Loch Lomond and where possible describing the wider Scottish context. From analysing this case study issues regarding the larger picture of informal education in Scotland can be deduced and discussed.

The overall project is an interdisciplinary study undertaken using the methodology of science. However although the project deals primarily with science education subjects (geology, physical geography, biology) it also encompasses social science areas such as human geography and aspects of primary education. Therefore for some the issues addressed by this project may be considered to be within the social science domain.

1.4 Methodology

Having discussed the need for the project and its specific aims it is important to briefly mention the projects methodology. The project utilized qualitative data collection performed through semi-structured interviews with various parties involved in outdoor education at Loch Lomond. In order to develop a rounded picture of the situation regarding informal learning at the park both park educational staff and visiting teachers were interviewed. This was in order to allow an insight into both the interviewee's personal experiences regarding field trips to the park and also their experiences and feelings on the projects subject matter within their larger professional context – either the school system or within the national park. Semi-structured interviews allowed all the interviewees in the two sets – teachers and park staff – to address the same issues yet elaborate on issues which they feel are personally relevant.

The theoretical basis for the project comes from the philosophies of grounded theory and activity theory. Due to the projects innovative nature it was important to consider the ideas surrounding grounded theory. Grounded theory proposes the generation of theory from data produced through research. As the project is the first of its kind to be performed in this particular location it was difficult to use a preformed hypotheses as there was no way to predict accurately what would happen in an area which has no previous studies or literature explaining the situation. The current thinking surrounding the development of activity theory was used in this project for a variety of reasons. While the situation on the ground regarding informal education was unknown at the projects initiation some ideas from activity theory regarding the use of educational tools and internal contradictions being a driving force for change were considered during the project, particularly in order to understand knowledge attainment within the context of a field trip. A greater explanation of these issues will be found within the methodology section of the project.

1.5 Overview of Project Chapters

1.5.1 Introduction

This chapter is a brief account of the context surrounding informal education in Scotland. The chapter covers the need for effective bridging of informal and formal education in schools in order to maintain a quality education system. The chapter highlights the important role that informal education plays in a students learning and introduces the terminology of formal informal and nonformal education. The reason for the selection of Loch Lomond and Trossachs national park is discussed in this section. The introduction also includes the thesis's research questions, a description of the project's direction and a short account of the projects methodology.

1.5.2 Literature Review

The literature review consists of a collection of the issues surrounding the bridging of informal and formal education found through researching the academic literature. The issues surrounding the terminology usage of informal, formal and nonformal education are discussed. Common themes are highlighted in relation to the 6 research questions of the thesis and academic findings regarding these questions are evaluated. Gaps in the academic literature, such as a lack of material within a Scottish context, are noted.

1.5.3 Methodology and Design

This chapter covers the design and methodology of the thesis. The theoretical grounding of the project is discussed covering the areas of grounded theory and activity theory. The theoretical background toward the

projects practical data collection is discussed through the subject of phenomenography. Finally the practical data collection methods are elucidated through the descriptions of the use of semi-structured interviews.

1.5.4 Results and Discussion

The results and discussion section is the largest section of the thesis. The results of the data collection are shown through the use of quotes and the findings of the interviews are discussed in relation to the thesis' research questions. The results are divided into the six research questions mentioned in the introduction:

- Why are teachers and school parties visiting the park's informal learning environment?
- When the field parties are at the park what are the variables that affect learning?
- How are field trips to the park structured?
- How is knowledge attained on a field trip?
- How does the informal learning facilitated at the park correlated to the new Curriculum for Excellence?
- What are the strengths and problems regarding informal learning at Loch Lomond and Trossachs national park?

Each of the projects' questions are addressed in a separate section in this chapter in order to collectively answer the question of how to bridge informal and formal education at Loch Lomond and Trossachs national park. The questions are addressed through the examination of the data collected at the national and the findings of the literature review. Emergent themes are discussed and highlighted.

1.5.5 Summary

This section summaries the findings of the thesis and answers the projects research questions. The summary section also briefly addresses any problems encountered during the project and suggests important areas for future research.

2 Literature Review

The question of how to bridge informal and formal education is one of the major issues facing educators today. Schools in Scotland have evolved to become the principal places where children learn and they are central to our notions of education. However, even the most ardent supporter of the Scottish school system would have difficulty arguing that schools are the only places in which children learn. In fact, increasingly, educational researchers from around the world are investigating the concept of informal and non-formal learning, and the roles that these may have in supporting formal education (Rammy Gassert 2010; De Witt & Osbourne 2007; Eshach 2006; Olson, Cox-Petersen & Mc Comas 2001; Delany 1967).

Scotland has a wealth of exceptional sites that could be employed for informal and non-formal educational purposes. Loch Lomond and Trossachs national park – one of the country's only two national parks – accommodates many areas of natural beauty, sites of special scientific interest and rural communities. It is within 90 minutes drive from Glasgow and Edinburgh, and is within easy reach for a large proportion of Scotland's population. The park caters for many different audiences such as families, tourists, youth organisations, walking groups and people partaking in outdoor physical activities such as fishing or jet skiing.

In order to investigate the research question of how to bridge informal and formal education the thesis has to address six smaller questions:

- Why are teachers and school parties visiting the park's informal learning environment?
- When the field parties are at the park what are the variables that affect learning?
- How are field trips to the park structured?
- How is knowledge attained on a field trip?
- How does the informal learning facilitated at the park connect with the new Curriculum for Excellence?

- What are the strengths and problems regarding informal learning at Loch Lomond and Trossachs national park?

These questions will be answered throughout the thesis through a combination of an analysis of the available academic literature, and the data collected for this project at Loch Lomond. However, before these questions are specifically addressed it is important to investigate what the terms informal and formal mean in regards to education, and also to address any academic issues surrounding the area of informal education.

2.1 Formal, Informal or Non-formal?

2.1.1 Formal Education

The terms formal, informal and non-formal are commonly used in the educational literature. Before exploring the research questions I will briefly examine the meanings of each of these terms.

Formal education is perhaps the easiest descriptive term for educators and lay people to understand. Coombs (1973) defines formal learning as,

> "The hierarchically structured, chronologically graded educational system running from primary school through the university and including, in addition to general academic studies, a variety of specialized programs and institutions for full-time technical and professional training". - Coombs (1973)

This structured classroom-based educational process is usually the first thing that people think of when asked to think about education. However findings by Medrich et al., (1982) show that approximately 85%

of the time that children are awake is spent out of the classroom. It is also obvious to many people that someone does not stop processing information and developing ideas the moment they leave the classroom. In fact education is a continual process and the learning that is facilitated in schools plays only a part in it. In recognition of this educators are increasingly turning their gaze to other locations in which learning takes place and in particular to places where it is promoted and encouraged.

Zoos, museums and national parks all provide a wealth of educational support, helping to facilitate learning in settings that are very different from formal education. Learning that takes place outside of a hierarchically chronologically graded educational context is not, according to Coombs' definition, formal learning - therefore what is it? In response to this question educational researchers have proposed the twin ideas of informal education and non-formal education. How much these two areas overlap and how far they interact with formal education is an issue that I will look at in this review. However, to start with, it is important to understand what educational researchers are expressing with their use of the terms 'non-formal' and 'informal'.

2.1.2 Non-formal Education

Non-formal education has been described by Kleis (1973) as,

> "Any intentional and systematic educational enterprise (usually outside of traditional schooling) in which content is adapted to the unique needs of the students (or unique situations) in order to maximize learning and minimize other elements which often occupy formal school teachers (i.e. taking roll, enforcing discipline, writing reports, supervising study hall, etc.)" Kleis (1973).

Non-formal education is also described by another educator, Ettlng (1993), as occurring within organizations such as Guides and Scouts, which are less structured than schools. Ettlng follows on to

conclude that non-formal learning allows young people more choices and provides less curricular sequencing and enforced learning than in formal learning.

The views put forward by Kleis and Ettlng are supported by Eshach (2006). Eshach agrees with Ettlng's idea that nonformal educational events happen out with the spheres of formal or informal education. Eshach also supports Kleis opinion that non-formal learning occurs in a planned but highly adaptable manner in institutions and organizations such a youth groups, in situations beyond the spheres of formal or informal education. Eshach (2006) makes a final interesting point in that he adds, "…[non-formal education] shares the characteristic of being mediated with formal education, but the motivation for learning may be wholly intrinsic to the learner." This idea of a learner centred and learner motivated education, as a requirement of non-formal education is an issue that has troubled some educators and will be discussed in more detail later.

In synopsis, the findings from Kleis, Ettlng and Eshach suggest that: non-formal education is found in the realms of non-academic associations; it is flexible, learner centred and motivated, and is highly adaptable. All three educators also agree on a final point: as non-formal learning is not in the formal education system - as the learning is controlled by the participant - then students in non-formal education may drop out any time without penalties. Clearly in a school pupils do not have the chance to leave should they lose interest in the teacher or subject, whereas in non-formal education this is always an option for participants. Consequently, educators working in the sphere of non-formal education must work harder to keep students engaged, with non-formal educators tending to emphasize options and choices within the subject rather than the prescribed, sequential curriculum found in schools. Many non-formal educators also emphasize the skills, knowledge and attitudes which are desired by the individual learners as opposed to teaching from a requisite curriculum or school syllabus. Ettlng (1993) also argues that non-formal content can be seen as a more practical education than formal education with the responsibility for discipline shifting from teacher to student.

2.1.3 Informal Education

Informal education could be regarded as learning that is neither formal (and thus found in schools) nor non-formal which is more learner centred and found in clubs and societies. However, when looking at the literature provided by educators working in this field definitions of informal learning become confusing. Etllng (1993) suggests the idea of informal learning coming through everyday experiences by suggesting the example of a child learning to speak through listening and imitating their parents. He states that,

> "their trial and error efforts are augmented by parents, siblings, and friends who encourage correct sounds and spontaneously correct errors" (Etllng 1993).

This learning is unstructured and definitely out with the school system, happening in a much more informal social setting without the power system found in the formal educational settings of teacher and student (Csikszentmihalyi and Hermanson, 1995).

Other researchers have described informal education as applying to situations in life that come about spontaneously, for example within the family or larger community (Maarschalk 1988). Csikszentmihalyi and Hermanson's (1995) research also suggest that the informal learner is self-motivated and chooses the route taken to acquire the desired knowledge, skills, or abilities. Informal learning can be seen as spontaneous, non-sequential and intrinsically motivated; it is facilitated by social situations and completely voluntary.

Educational researchers are currently still debating the definition of informal education. While the educators mentioned above seek to define informal education as something distinct from other areas such formal or non-formal educators some researchers such as Gerber et al. (2001) argue that,

> ''In essence, the informal learning can be defined as the sum of activities that comprise the time individuals are not in the formal classroom in the presence of a teacher'' Gerber et al. (2001).

Gerber's definition ignores the idea of non-formal education and combines children learning to talk at home with a field trip by some Girl Guides to a science centre. So why does Gerber et al suggest this, why ignore the separate category of non-formal education?

The answer to Gerber's use of terminology is that some types of learning do not fall into any of the categories proposed by educators such as Kleis (1973). Moreover some types agree with more that one definition. A teacher taking a class on a field trip to a science centre or national park may include formal teacher pupil relationships and the use of curricular worksheets, which are defined as examples of 'formal education'. However during the trip the student could also have the option to direct their own learning on the trip towards areas at the centre that best interest them, or walk away from exhibits which bore them. This is typical of "informal education".

Etllng (1993) states that, "while formal and non-formal education are different, they are not opposites… the differences are more a matter of degree in each of these types of education." Eshach (2006) agrees with Etllng (1993) and raises the issue of the field trip by stating that, "a variety of institutions are still hard to categorize as non-formal, because they are still different despite the fact that their activities might share some similarities." The problem of distinguishing between formal and informal learning was also found in Hofstein and Rosenfeld (1996) who contended that, "There is no clear agreement in the literature regarding the definition of informal science learning...The major difficulty in defining informal science learning is determining whether or not informal science learning can take place within formal settings." Further, Dierking (1991) adds that sharp distinctions between formal and informal learning are unnecessary as for him the physical setting of the education (which is proposed as an indicator of terminology usage) is only one of a number of factors governing learning.

In response to the arguments proposed by the researchers above I believe that the terms informal, non-formal and formal education are not exclusive and while they provide a descriptive dialogue to some aspects of what is going on during an educational activity such as field trip, their precise definitions rarely

singularly capture the complex interactions of the educational process. The academic criteria discussed of informal, non-formal and formal education are useful in that they provide a template within which it is possible to study the educational process. However, understanding learning on a field trip is rarely this straightforward. Maars-chalk (1988) highlights the fact that education is subject to many competing factors, each affecting participant learning.

Due to the many competing definitions of what constitutes informal, formal and non-formal education this project has undertaken their usage under the following more simplistic meanings. Unless otherwise stated in regards to the project the term informal will refer to all educational work carried out physically at the park and therefore out with the schools classroom and physical environment. Formal education will refer to all work undertaken within school grounds and pertaining to the rules, standards and normalities of the official Scottish education system. Non-formal will refer to the educational pursuits of charity and youth clubs and as such is rarely used in this thesis.

2.2 Negative Aspects of Field Trips

Downsides to field trips have been mentioned in many studies (Fisher 2001, Tilling 2004, Dillon 2006, Anderson 2006, Delany 1967, Koran 1989, Fido & Gayford 1982, McCaw 1980, McKenzie Utgard & Lisowsi 1986, Hickman 1976, Mirka 1970). These studies have highlighted a variety of issues found with field trips. One such problem is an over prescriptive curriculum. In the UK early versions of the national Curriculum contained assessment criteria for practical investigations that required students to be able to recognise and manipulate the relevant independent variables involved in their experiments. Fisher (2001) found that,

> "Natural systems were thus seen as too complex for student-based investigations, with the result that assessed practical work, despite various revisions to the Programmes of Study, still tends to be restricted to the laboratory bench" Fisher (2001).

Other problems with field trips noted by the researchers listed above are the lack of teaching materials relevant to outdoor learning, high organisational costs, lack of teacher confidence in performing field trips, changing professional values with outdoor learning being seen as less important than classroom teaching, and increasing bureaucratic complexities in areas such as health and safety. All of these factors can negatively influence the provision of field trips and taken on their own would suggest that education outside of the classroom is not worth the teacher's time or effort.

However, from studying the wider literature this project has discovered that although there are undoubtedly negative issues with field trip provision and informal learning in general, these issues are not insurmountable. Further, many believe and that the benefits found regarding informal education far outweigh the negative issues.

So, what are these supposed benefits of informal education? Are they reason enough to leave the classroom and how exactly could they benefit curricular teaching? The answer to this is multifarious and shall be answered throughout the literature review. However, we shall start by discovering why educators organise field trips and investigate their reasons for leaving the classroom.

2.3 Why Leave The Classroom?

Through reviewing the current literature and investigating older studies this project has sought to understand why, with all the advantages that schools and classrooms bring to education, should teachers and educators decided to invest their time and energy in organising a field trip? By understanding the strengths problems and reasoning behind organising an informal educational excursion it will make it easier to understand how to bridge these field trips with the formal Scottish education system.

2.3.1 Revealing Phenomena in Their Natural Settings

One of the greatest strengths found by educational researchers regarding field trips is their ability to demonstrate and illustrate objects or phenomena that are not accessible in other settings. A field trip can enable direct contact with an inaccessible object or location and allow teachers to cover areas impossible in a classroom. For students being taught environmental biology there is nothing like being out in the environment studied and experiencing first hand the factors that you are learning about in the classroom. Research by Keown, (1984); McNamara and Fowler (1975); Riban and Koval (1971) Rebar (2009) and Lonergan (1988) have all shown the importance of field trips in conveying areas that for some reason, either conceptual or physical, cannot be taught in the classroom. Orion & Hofstein (1994) stated that,

> "…the field trip can provide students with concrete experiences, allowing them to interact physically and to manipulate objects (e.g. biological specimens and physical phenomena) which are unavailable in the formal classroom" Orion & Hofstein (1994).

Allowing students on a field trip to interact with objects that are physically too big to have in the classroom can allow them to experience both the object itself and also its role in its natural surrounding. The benefit

of allowing students to discover objects in their everyday locations is also noted by Tal & Morag (2009), who quoted an earlier study by Scarce (1997) stating that,

> " the field trip as experiential learning allows the students to engage with real natural or sociological phenomena in a real context, and it allows the instructor to bridge the school learning with authentic expressions of the more abstract descriptions" (Tal & Morag 2009).

The power of a field trip to bridge school learning through memorable authentic expressions and its ability to convey conceptual issues physically have been shown from the literature studied to be one of the greatest strength's of a field trip.

The idea of field trips and informal learning helping students to relate their classroom studies to the wider world is an area that is supported by much educational research. In a paper discussing the value of outdoor learning Dillon et al (2006) note that,

> " well taught and effectively followed up [field trips], offers learners opportunities to develop their knowledge and skills in ways that add value to their everyday experiences in the classroom" (Dillon et al 2006).

As classroom experiences constitute the vast bulk of formal learning anything that can add value – such as a field trip – should be utilized by effective teachers. Flick (1993); Ballantyne (2004), Anderson (2006) Gilbertson (1990) were all found to agree with Dillon's findings regarding field trips increasing educational value and research.

Flick further claims that,

> "hands-on activities give students the opportunity to identify with scientific investigators in such a way that they can see continuity between their experiences now and in the future." Flick (1993)

A field trip incorporating hands-on active learning could then, argues Flick, provide an important bridge between the students and the scientific investigators they are learning about. Research by Bybee (1989) supports Flick by arguing that,

> "Through hands-on activities, students can learn about the nature of science and technology as the parallel human endeavours of creating explanations for natural phenomena (science) and solving problems of human adaptation in the environment (technology) Bybee (1989)."

Science teaching in classrooms can appear abstract to students with concepts not seen as relevant to students' lives. By learning through field trips about past endeavours and why there is the need to explain natural phenomena, about why humans have had to adapt and have adapted the natural environment, field trips can act as a powerful tool to show students how science is relevant to both them as a person and also the society they live in.

Deepening Conceptual Development and Reinforcing Concepts

One of the most important reasons found during this investigation for leaving the classroom and participating in informal education was that field trips have been scientifically shown to deepen conceptual development and reinforce concepts previously presented in the classroom. In their work on museum learning Ramsey-Gassert & Walberg (1994) found that,

> "Science museums provide opportunities for students to be active participants in learning by manipulating real objects in a stimulating setting thus enhancing conceptual learning in the classroom" (Ramsey-Gassert & Walberg 1994).

This idea that active learning enhances classroom learning is central to educational thought regarding field trips and is supported by many other researchers (Keown 1984, Novak 1976, Lonergan 1988, Tal 2001, Ayres and Melears 1998, Rennie 1994, Wolins et al 1992, Eshach 2006, Anderson 2006). Eaton (2000) also

found that the location of the active learning is important and that, "outdoor learning experiences were more effective for developing cognitive skills than classroom". While this may seem like a bold claim it is supported by other educationalists such as Gerber (2001) who found,

> "Students with enriched informal learning environments had significantly higher scientific reasoning abilities compared to those with impoverished informal learning environments" Gerber (2001)

and also Hofstein and Rosenfeld, (1996) who cited Harvey's (1951) study which found that an experimental group that underwent a series of geological field trips, out-performed the control group which discussed ecological concepts in a regular classroom.

However, important as the findings are about informal learning benefiting the teaching of scientific concepts, and active learning benefiting conceptual teaching, they are not the only aspects of education which are positively influenced by teachers choosing to extend their teaching outside the classroom. Teaching is not just about explaining facts and concepts; it is also about exploring attitudes, both personal, and in society. So how does informal learning in the form of field trips affect the attitudes of science students and their teachers? Is there any point in leaving the classroom to challenge our scientific dispositions?

2.3.2 Changing Attitudes

Anyone who has ever experienced formal education will be aware of the affect that a positive attitude has on a person's ability and enthusiasm to learn. Fostering affirmative beliefs about science is one of the main aims of any science educator and it is important to discover if informal education in the form of field trips can be of any benefit to this. The literature found regarding the ability of field trips to change student's attitudes is overwhelmingly positive. Dillon et al (2006) supported Bogner's (1998) findings that,

> "the [outdoor] program explicitly provoked favourable shifts in individual behaviour, both actual and intended'. Bogner's (1998)

This is also in agreement with the findings of Orion et al (1996) who's research into the learning environment of outdoor science activities concluded that,

> "…the perceptions of students who participated in active outdoor learning events were found to be significantly more positive both statistically and educationally in 5 of the seven scales." Orion et al (1996)

The belief that field trips foster positive attitudes in children towards science is also a conclusion found by Eshach (2006) whose research built on the positive findings of Jarvis and Pells' (2002) study which looked at children's attitudes to physics after visiting the Challenger space simulation. While Jarvis and Pells' work looked at attitudes to physics, much of the literature relevant to education at Loch Lomond regards the environment. It is interesting to note that many researchers found that environmental field trips were especially suited to challenging student perceptions (Ignatiuk, 1978; Keown, 1984; Kern and Carpenter, 1984). Lonergan (1988) summarises this position with his finding that field trips,

> "…stimulate, in cases where the field is a natural environment (whether physical, cultural or social), an attitude of appreciation, concern, and valuing of that environment." Lonergan (1988)

In today's society where environmental issues are becoming more pressing, informal educational field trips have been shown as a vital tool to foster positive environmental attitudes.

2.3.3 Teacher Attitudes

Research has shown that field trips are not only useful in fostering positive attitudes for students they can also help with improving teacher attitudes. A study by Anderson et al (2006) looking at an aquarium visit by pre-service teachers found that,

> "all pre-service teachers in the cohort experienced profound changes in their views of what it means to teach and learn, gained confidence in their ability to teach, and felt empowered as science educators following their teaching in the informal setting". Anderson et al (2006)

Findings from Johnson and Chandlers' (2009) investigation into a field trip by maths teachers to a North Carolina Battleship support Anderson's findings regarding the benefits of informal field trips to pre-service educators, reporting that,

"the trip to the USS North Carolina Battleship was a positive experience that opened their eyes to resources available to them and ways in which to work with others in different areas." Johnson & Chandler (2009)

The ability of field trips to allow people to experience a novel way of conceptualizing an educational idea has been shown from the research to be beneficial to changing attitudes in both students and educators. Attitudes are formed through a mixture of personal experiences and social interaction. Field trips - and the majority of informal learning experiences- are social events. Therefore it is important to look at what –if any - effects there are to interpersonal relations brought through the implementation of field trips. If a teacher is attempting to increase class cohesion and improve group learning dynamics could leaving the classroom help?

2.3.4 Social Benefits

Various studies have highlighted the benefits to social relations that informal learning environments can provide (Flick 1993, Connor 1973, Connor et al., 1975, Pashuk, 1975 Lonergan 1988, Gilbertson 1990, Orion 1991). Sharing in new physical experiences boosts camaraderie and interaction. Working on group projects during field trips requires close contact between group members and for the project to be a success group participants must be able to work together. Flick (1993) summarises the social benefits of field trips with his findings that,

"…cooperative group arrangements and the need to interact with a variety of new materials provide opportunities for students to develop social (interpersonal) skills as well as intrapersonal and metacognitive awareness skills." Flick (1993)

While it is possible to achieve group arrangements in the classroom they are quite often not on the same scale as those available on an excursion and so their benefits may not be as distinct.

2.3.5 Student - Teacher Relations

Inter-student relationships are not the only beneficiaries of a well-organised field trip; educational researchers have found that leaving the classroom can affect teacher student relations as well. While this is an area which has not, as yet, been studied greatly by researchers; the few projects which have studied it have found some promising findings. Swan 1985 observed that,

> "participants [in field trips] gain such outcomes as better student-teacher relationships, improved self concept, and a positive attitude toward the natural world" - Swan 1985

Swan's findings have been supported by Gilbertson (1990) whose study focused on environmental learning. A study interviewing students who participated in a Geography field trip in Hong Kong - Lai (1999) - noted that amongst the other field trip benefits such as "freedom from classroom restraints" and "escaping the perceived boredom of the classroom" participants noted an improvement in student teacher rapport. Tal & Morag (2009) looked at the issue of student teacher relations as well during their investigation on 'Reflective Practice as a Means for Preparing to Teach Outdoors in an Ecological Garden'. During this investigation it was noted that it wasn't just students feeling an amelioration in relations during a field trip,

> "teachers noted improved relationships with students, personal development in their teaching, and curriculum benefits as well" (Tal & Morag 2009)

Therefore it is interesting to note that studies have shown that both educators and students feel that field trips can be beneficial to improving teacher pupil relations.

2.3.6 Field Trips Appeal to Multiple Aims

Researching the current literature on informal learning – and on field trips in particular- has unearthed a final important point, this is that a properly performed field trip engaging in an informal learning environment can appeal to multiple aims and accommodate multiple learning styles. Research by Flick (1993) found that hands-on science - incorporated in many field trips - can benefit students as it accommodates Gardner's (1983) theory of multiple intelligences. As field trips facilitate a large number of learning styles they can engage children who may not learn effectively from the traditional passive learning style practiced in many schools. Educational researchers such as Lugg (2007) Lonergan & Andresen (1988) and Higgins (2002) have also found that field trips are an important tool in integrating knowledge and skills from a variety of disciplines; this combined with findings from Flick (1993) and Priest (1986) which suggest that field trips help train the use of the senses suggest that field trips could be very important for

schools in Scotland trying to implement the new 'Curriculum for Excellence' with its emphasis on cross disciplinary learning and outdoor education. Another interesting finding from the literature review regarding field trip education is the effect that field trips have on our memories and thus our long term attitudes to science. Falk (1983) found that field trips generally result in "enjoyable and long-lasting memories". This makes field trips a useful device in facilitating a lifelong predilection towards science and supports the need for educators to utilize outdoor learning. A final surprising finding from the literature review regarding field trips is the effect they can have on encouraging girls to study science. Ramey-Gassert (1996) found that,

> "…informal science centres provide opportunities for active science in non-evaluative and non-threatening environments that invite girls to take on the challenge of a subject that is traditionally viewed as male-dominated" (Ramey-Gassert 1996).

This is supported by Esarch (2006) who found that,

> "…scientific field trips may play a significant role in inculcating positive attitudes toward science among children, in boys and even more importantly, in girls". (Esarch 2006)

Therefore, an unexpected finding from the literature surveyed is the advantageous role that field trips can play in fostering gender equality in the scientific profession, a point little considered by many science educators.

2.3.7 Summary of Field Trip Benefits and Reasons to Leave the Classroom

The benefits of a field trip mentioned thus far are: the excursions capability to demonstrate and illustrate objects or phenomena that are not accessible in other settings (Keown, 1984; McNamara and Fowler 1975; Riban and Koval 1971 Rebar 2009; Lonergan 1988; Orion & Hofstein 1994); the discovery that field trips

and informal learning helps students relate their classroom studies to the wider world (Tal & Morag 2009 & Scarce 1997); that field trips have been scientifically shown to deepen conceptual development and reinforce concepts previously presented in the classroom (Ramsey-Gassert & Walberg 1994; Keown 1984; Novak 1976, Lonergan 1988, Tal 2001, Ayres and Melears 1998, Rennie 1994, Wolins et al 1992, Eshach 2006, Anderson 2006); the ability of field trips to foster positive student attitudes in both genders (Dillon et al 2006; Bogner 1998; Orion et al 1996; Jarvis and Pells 2002; Ignatiuk, 1978; Keown, 1984; Kern and Carpenter, 1984; Lonergan 1988) and the beneficial affect that field trips can have on inter-student and student teacher relations (Swan 1985; Gilbertson 1990; Lai 1999; Tal & Morag 2009).

However, none of the literature studied suggests that a field trip caters for only one of these benefits at a single time. A search of current literature has shown that the most important reason that teachers should leave the classroom with their students to participate in some informal learning is that a well prepared and properly performed field trip can have all of the benefits suggested. Increased interpersonal skills can benefit conceptual development and demonstrating previously inaccessible phenomena can help link classroom studies to the wider environment. A properly performed field trip is beneficial in multiple ways and plays an important role in good educational practice. However, for a field trip to be a success, for an educator to reap the benefits that informal education has been shown to offer, then it is crucial to understand the workings of a field trip and how best an educator can structure a field trip to harvest its educational value.

2.4 How is an Effective Educational Field Trip Structured?

This section will review the literature regarding how an effective field trip is structured. This is in order to better understand the research question of how field trips to Loch Lomond are structured through investigating common issues regarding the planning of educational excursions found in the academic literature.

As mentioned previously a field trip may have many benefits, be it in changing attitudes, helping with the development of social skills, promoting autonomy and reasoning or helping to relate science to the wider world. With so many possible beneficial outcomes from a field trip it can seem a daunting task for educators to plan an outing that maximises the cognitive and educational development for the students, allows for personal and social growth but yet at the same time is unlike the standard formal learning they are used to. To help educators and to solve these problems a fairly large body of educational research is available. For the purposes of clarity the structure of a good field trip will be looked at in regards to its key stages suggested by the relevant literature: pre-visit and preparatory work, structuring fieldwork during the outing – looking at the use of worksheets and the role of the 'novelty factor' – and finally the structuring of post-visit activities. Issues of bad practice will also be discussed in order to highlight the problems facing educators in structuring an effective educational science field trip.

2.4.1 Pre-visit

Amongst educational researchers studying field trips there is much agreement about the importance of including pre-visit activities in the structuring of an informal educational excursion. Early educators such as Breukelman (1959) stressed the importance of pre-visit preparation by educators wishing to perform a field trip,

> "Before the trip starts, the leader should explain to the group just what the trip is for, what its objectives are and what is likely to be seen." – Breukelman (1959) cited in Delany (1967).

While this may seem like common sense to many, it has been shown by studies by Griffin & Symington (1997), Cox-Peterson & Ptaffinger (1998) and Olson (1999) that many teachers - for reasons such as lack of time and resources or poor educational management – fail to do this. For the teachers that perform pre-visit preparation there is a vast amount of research that highlights the positive effects that these educational activities can have; Orion and Hofstein (1994) Healey et al (2001) Dillon et al (2006); Griffin and Symington (1997); Falk et al (1978); Finson and Enochs (1987); Anderson et al (2000); Falk Dierking (1992); Gennaro (1981); Ramey-Gassert et al (1994); Koran, Koran & Ellis (1989); Lonergan (1988); Anderson et al (1997) and Ballantyne and Packer (2002). Some proposed pre-visit activities that are suggested for a successful field trip are: an explanation of trip aims (Breukelman 1959), that teachers should be thoroughly familiar with the informal setting to be visited (Anderson et al 1997); the use of prior instructions such as films, slides, lectures, outlines and supplemental reading (Koran, Koran & Ellis 1989) and also a thorough briefing and debriefing of the student participants (Lonergan 1988). While all the papers studied found pre-visit activities to be a good thing, an interesting finding is from Delany's 1967 study. In his work it was found that

> "Two-thirds of the students, those possessing average and less than average academic ability were shown statistically…to have benefited significantly from pre-field trip introduction." (Delany 1967)

It is an interesting point that students of superior academic ability did not significantly benefit from any prior introduction to the field trip. This is useful information for any teacher pushed for time as it suggests that students who are struggling academically should be prioritised for pre-visit activities.

In synopsis the literature reviewed is clear that a successful educational field trip should incorporate a comprehensive pre-visit plan. However while an educator might include the best pre-visit activities in the

world it is undeniable that what goes on during the field trip is what most shapes the educational outcome of the trip. Therefore to understand just how an effective field trip is structured we must now focus on what happens during the educational visit in the informal learning environment.

2.4.2 Learning Factors During a Field Trip

Some general points highlighted by the literature regarding learning during a field trip were found by this study. Firstly the length of the field trip appears to be a factor in the educational value of the field trip. Researchers such as Emmons (1997), Bogners (1998) and Dillon et al (2006) found that there was considerable evidence indicating that longer programmes are more effective than shorter ones. The length of a field trip is often dictated by many factors such as cost, locality, field facilities and the age of the students. While all these factors should be taken into consideration it is an interesting point to note that longer field trips are more effective field trips. Another issue raised by educational researchers regarding learning during a field trip was the question of how far do you structure the learning on your field trip? Educators in general are comfortable in structured formal learning environments and as such there is tendency for some to try to recreate the classroom environment whilst on a field trip; this however has been shown from research to be detrimental to the field trips educational benefit (Griffin & Symington 1997) with researchers finding instead that semi structured field trips are best (Griffin 1998, Falk & Dierking, 1992; Hooper-Greenhill, 1991; Price & Hein, 1991; Rennie & McClafferty, 1995). Researchers DeWitt & Storksdieck (2008) state that,

> "to maximize both cognitive and affective outcomes, it would seem that field trips should provide a moderate amount of structure while still allowing for free exploration". (Storksdieck 2008)

DeWitt & Storksdieck's findings agree with a point mentioned by Griffin (1998), who mentions that,

> "for school groups to make successful use of museums as learning resources, appropriate teaching and learning approaches and strategies, involving a shift from task orientation to student centred learning orientation, are needed." (Griffin 1998)

Finally Openshaw and Whittle (1993) - cited in Dillion et al (2006) - comment upon the need for teachers and outdoor educators to balance the students' desire for a structure within which they can feel comfortable and not threatened and the added excitement caused by the unexpected. All the researchers mentioned in this section highlight the importance to educators of allowing the student some freedom to chose which style of learning best suits themselves in the free-choice learning environment. To cope with this need to employ a semi structure for field trips many teachers implement the use of worksheets to provide some guidance as to what areas in the informal learning environment should be focused upon by the students. Consequently, as worksheets are incredibly common amongst field trips as a tool for structuring it is important for this project to look at their education effect and what benefits and costs they could bring to a field trip.

2.4.3 Worksheets

The use of worksheets during field trips and within informal learning environments is an issue that has divided educational researchers. The proponents favouring their use on field trips are researchers such as, Griffin (1994), Kisiel (2003), Mony & Heimlich (2008) and DeWitt & Storksdieck (2008). Griffin (1994) and Kisiel (2003) reported that some of the benefits of worksheets are that: teachers are comfortable with them, informal learning environments are happy to provide them, some teachers and pupils studied felt that their learning was supported by worksheets and finally that worksheets – "if designed effectively - can promote discovery and inquiry-style field trip experiences" Kisiel (2003). An interesting finding was found in Mony and Heimlich's (2008) study looking at learning during field trips to zoos. In their report Mony and Heimlich noted that visitors to a zoo mentally merged message sources about conservation. The visitors accredited messages to guides or teachers, when in fact they actually received them through

signage; therefore this suggested that visitors to informal learning settings might learn more by reading than they themselves realize, this in turn highlights the importance of worksheets. Finally DeWitt & Storksdieck (2008) noted that,

> "by focusing student attention, well-designed worksheets might tap into the power of existing interpretive materials while providing students with a visit experience that is more reflective of free-choice visits." (DeWitt & Storksdieck 2008)

This clearly is important in regards to earlier findings about the need for a semi structured learning experience.

Worksheets have been found to have many beneficial factors; however not every educator is convinced, so why is this? The answer to this is that structure is often imposed by worksheets and, while some structure is important, informal learning visits should allow the participants a freedom in learning choices and styles not usually accessible in the classroom, many worksheets can over structure and deny students the freedom. Researchers such as Kisiel, (2003) & (2006), McManus, (1985) and Price & Hein, (1991) also found that worksheets on field trips can be used as a tool for behaviour management; and that often worksheets possess too detailed questions that do not allow pupils to explore and engage with the unique experience that informal learning allows. In essence it was found that many educators use worksheets as an instrument to impose formal learning practices in informal environments. However, I believe that these negative findings by the researchers are not strong enough reasons to stop using worksheets altogether, they simply highlight the importance of appropriately designing a worksheet so that it guides the pupil rather than confines them. The issue therefore I feel is not whether worksheets should or should not be used, but rather that in trips where they could have been potentially useful they have been let down by their poor design and misguided use. Therefore just how can a worksheet be utilized effectively? How can it guide a pupil and still allow the student to engage with the unique field experience? To answer this research on this area had been performed by educators such as: McManus, Mortensen & Smart and DeWitt & Storksdieck. McManus (1985) made several recommendations for ways to turn worksheets into more effective learning

tools in an informal setting. In her paper she suggests that worksheets should; encourage observation, allow appropriate time for observation, refer to objects rather than labels, be clear about where information might be found and finally encourage communication among group members. Mortensen & Smart (2007) have built on McManus' proposals and have developed criteria for worksheets to support learning from a school trip. DeWitt & Storksdieck 2008 found that worksheets based on the criteria proposed by McManus and Mortensen & Smart, — work sheets that encourage free-choice exploration of curriculum-related topics— were, "found to increase the number and diversity of students' content related conversations during a museum visit." As discussed earlier a major benefit of field trips is their ability to help with children's communication and team working skills. A well designed worksheet that increases communication as well as the diversity of topics covered can only be a bonus for educators. Worksheets can pose problems for educators as if they are used badly they can stifle creativity, impose too high a level of order and blur the educational focus from a field trip. However, used properly worksheets can be a hugely helpful tool that can facilitate effective learning. The key then is for educators to take time and thought on exactly what the worksheet they're assigning aims to do and how precisely it relates to their educational goals; a well designed worksheet will provide some structure to the field trip, facilitate learning and yet not smother the student nor impose formal teaching practice in an informal setting.

2.4.4 Post-Visit Activities

After an outdoor field trip the need for effective follow-up work has been stressed by several authors - Orion and Hofstein, (1994), Anderson, Lucas, Ginns & Dierking (2000); Farmer&Wott, (1995); Finson & Enochs, (1987); Gennaro, (1981); Lucas (2000). It is important to touch on the subject of post visit activities when investigating how to structure a field trip effectively. Some researchers such as Uzzell et al. (1995) have highlighted the need for clear links to be made between outdoor activities "the world of our physical surroundings" and indoor activities "the world of the school". This is supported by research by Lucas (2000) who investigated how one teacher's thorough preparation and follow-up work to a science centre visit resulted in both conceptual learning and a greater appreciation of the learning opportunities

provided by the visit itself. Griffin (1998) sums up this belief that post-visit activities and learning related to the field trip can enhance the educational capability of a field trip with his research findings which state that,

> "incorporation of the excursion into school-based investigations renders the purposes for the visit clearly apparent, and gives students a goal to achieve back at school using the information gathered at the museum" Griffin (1998).

Structuring fieldwork to support a classroom based learning outcome rather than having the field trip as a standalone event allows the informal learning experience to compliment rather than constrain curricular teaching. In this section we've looked at the need to structure a field trip to include a range of pre and post visit activities which allows an informal learning event to realise its educational potential. Educational research by Griffin (1995, 1996) and Griffin and Symington (1997) has shown that teachers in both primary and secondary schools interviewed during their projects have a poor understanding of ways to facilitate learning during excursions to museums. It is interesting to look at why this may be the case; what are the issues of bad practice in regards to field trip construction and implementation and how can they be avoided?

2.4.5 Bad Habits

Educational researchers studying field trips have noted bad habits that fall into three general areas: a lack of preparation and post visit activities, a lack of field trip structure and finally the use of inappropriate teaching methods. The first two areas mentioned have already been looked at with researchers such as Cox-Peterson & Ptaffinger (1998) noting teachers often neglecting classroom activities which support the field trip - both before and after - and Ballantyne and Packer (2002) warning against over structuring the field experience. The second point is important when looking at inappropriate teaching methods during a field trip. Many educational researchers (Griffin & Symington, 1997; Wals, 1994; Rebar 2009; Olson 2001)

noted that teachers commonly exhibited formal school behaviours during a field trip in informal settings, structuring the field trip as if it were a formal learning event. A common mistake found was that educators often attempt to lead the entire class at once in the informal environment. While this can work in the classroom, on an excursion holding a whole classes attention is problematic as students at the back are often too far away to hear the teacher. It is also much harder for teachers to hold the attention of the entire class for long periods of time outdoors, as there is much more to distract the students than in a classroom environment. Another common mistake performed by educators on field trips was noted in Cox-Petersen & Pfaffinger, (1998) study finding that,

> "teachers have also been documented favouring managing and observing roles rather than facilitator roles while leading museum field trips, thereby initiating fewer interactive activities" (Cox-Petersen & Pfaffinger, 1998).

Museums and informal learning environments provide a rich opportunity for students to learn in a variety of styles to suits a variety of needs. However, educators should not presume that this means they can take a back seat. It has been shown through the literature studied that the best structured field trips allow teachers to be involved in the educational process facilitating new avenues of learning yet still leaving room for the individual student to utilize the novel educational resources in manner best suited to them. This idea ties into the final aspect of structuring an effective educational field trip which will be looked at in this chapter. New educational resources and avenues of learning can have a greatly beneficial effect. However this 'novelty factor' has been shown to be both a boon and challenge. It is important therefore for any educator structuring a field trip to consider the novelty effect and to understand how the new possibilities of learning provided by a field trip can be made to enhance and not confuse a student's educational experience.

2.4.6 Novelty Factor

Various educational researchers have described the role that novelty - or unfamiliarity of the exhibits and their settings - plays in students' learning (Hofstein & Rosenfeld 1996; Kubota & Olstad, 1991). Two of the benefits of an informal learning experience is that it allows the provision of new educational phenomena unavailable in the classroom and also that a field trip provides a freedom from the customary formal environment that students and educators are familiar with. However, many educators have discovered that there is some evidence to suggest that the level of perceived novelty that students experience affects students learning behaviours and therefore also affects the subsequent cognitive learning outcomes derived from a visit to an informal learning centre (Falk & Bailing, 1982; Falk, Martin, & Bailing, 1978; Kubota & Olstad, 1991; Martin, Falk, & Bailing, 1981). Consequently for educators wishing to structure their field trip to maximise learning they must also take into account how their trip will deal with the novelty affect.

Recently there has been some educational research into the novelty factor which can be used as a guide to structuring a field trip. Research by Olson (2001) found that,

> "if the purpose of a field trip is to provide students with a learning experience, properly preparing students for the trip and making connections to the curriculum being studied in class are important" (Olson 2001).

Olson's research is supported by Anderson et al (1997) who noted that results on a post-test of cognitive learning of concepts and principles associated with the exhibits suggested that students who underwent novelty reducing pre-orientation to the physical environment and had prior visitation experience learned more than their counterparts. The importance of pre-visit activities has already been discussed in relation to their ability to clarify the educational aims of a field trip. The fact that researchers discovered that structuring a field trip to include pre-visit teachings also helps reduce the novelty factor again highlights how any educator planning a field trip should include preparatory activities.

Anderson et al (1997) investigated a final point regarding the novelty factor. The investigation asked if a prior visitation to an informal learning environment for orientation before the educational visit to the same

location benefited or harmed the field trips learning outcomes. It was hypothesised that visiting the same location twice could lessen the educational impact as the informal learning environment was no longer new and exciting to the students. However Anderson et al's research found that the combination of pre-orientation and prior visitation resulted in a greater reduction in novelty and a more marked increase in cognitive learning outcomes. This suggests that ideally preparatory work for a field trip should include if possible a pre-visit and an orientation aspect to reduce novelty and enhance cognitive learning.

2.4.7 Structuring Factors

The structuring of a field trip is influenced by many competing factors. Cost, time availability, educational resources, teacher competence, the length of the proposed excursion, the distance to the informal learning site, the type of informal learning environment visited and the age of the students all exercise power on the levels of structure possible for a field trip to an informal learning environment. From the literature reviewed a structural ideal has been assembled. Educators planning a field trip should take into account the novelty affect when planning a field trip; pre and post visit learning activities should highlight the aims of the trip and coalesce with classroom educational aims, supporting formal teaching rather than opposing or ignoring it – for students of a lower ability these activities become even more important. The research studied also highlights the need to structure a field trip to focus less on task-based education and more on the individual learner. It also suggested the best approach for an educator during a field trip is to adopt a looser structure allowing pupils to benefit from the educational freedom that informal learning provides while still providing some guidance either through the use of projects or worksheets. Clearly structuring a field trip is complex and individually specific; however, for a field trip to reap the possible educational benefits mentioned at the start of this review it is something that must be addressed by all educators embarking on a field trip. Structuring a field trip properly results in great cognitive and behavioural development. While we've looked so far at why educators should leave the classroom - as well as how to structure a field trip to maximise the learning outcomes - it is also important to look at how knowledge is attained on a field trip.

What does the educational literature say about how we learn on a field trip, does learning on an excursion differ from learning within formal education; how can we tell?

2.5 Learning on a Field Trip

Understanding how students learn whist on a field trip helps educators to understand the best ways to effectively convey concepts and ideas. Through investigating the academic literature surrounding learning on a field trip it is possible to address many of the research questions. The questions of, when the field parties are at the park what are the variables that affect learning, how is knowledge attained on a field trip and finally what are the strengths and problems regarding informal learning at Loch Lomond and Trossachs national park can be better understood by examining the academic thinking behind 'learning' and what its ideas, definitions and implications are.

2.5.1 Ideas on Learning

The words learning and education often convey different concepts to different people. Brody's work on environmental education describes learning as

> "the comprehension and acceptance of new concepts that are intelligible and rational and lead to a change in the meaning of experience for the learner." (Brody 2005)

As Brody's study focuses on environmental education it forms a useful blueprint for understanding the educational activities performed at Loch Lomond. Brody's environment education literature is of further use for this project because it highlights the notion that,

> "meaningful learning takes place in specific situations which embody a set of comprehensive principles of learning" (Brody 2005).

While traditionally this has referred to formal education and the idea that significant learning takes places in an academic environment, Brody addresses this idea and suggests that informal and nonformal situations can also represent the principles of learning; Brody further argues that for certain situations, for example environmental education, informal and nonformal locations can actually promote meaningful learning better than "tradition" classroom situations.

Eshach (2006) voices the opinion that it is too simplistic to see the field trip as only occurring at the visit location. Eshach is of the belief that the field trip, and consequently the learning that occurs on a field trip, begins with the preparation for the excursion. Taking into account Eshach's ideas it is thus important that when looking at the knowledge attained during a field trip educators carefully acknowledge the preparatory work performed by the participants, work which has been shown to affect students future knowledge attainment during a visit (Orion and Hofstein 1994, Healey et al 2001, Dillon et al 2006, Griffin and Symington 1997). Brody supports Eshach's (2006) and the aforementioned researchers findings on preparatory work by stating that,

> "it is important to note that among all the modern literature related to learning in informal settings, one major theme is found throughout and that is the important role of prior knowledge in learning" (Brody 2005).

The explanation given for participant prior knowledge having such an affect on levels of environmental knowledge attainment is the idea that a student's background knowledge works as a "cognitive anchor" during the field trip from which new information is synthesised (Brody 2005). Flick's (1993) paper also investigates the issue of prior knowledge and suggests that the reason students participate significantly in the teaching-learning process in informal learning situations is a direct result of the relevant prior knowledge that students utilize to make meaning out of new experiences.

2.5.2 Learning Theory

Having briefly looked at the definitions of learning and the need to investigate a field trip from its conception it is now important to look at some of the theoretical themes and concepts utilized by educational researchers. A competent understanding of educational theory can help educators improve the design of their scientific field trips, allowing for increased efficiency; in light of this it is important to review current theoretical findings in regards to informal science learning. Flick (1993) proposed that there are three major dimensions of learning in science: knowledge, attitudes, and skills. To examine the knowledge dimension of learning in respect to informal education some educators have proposed constructivism as a theoretical framework (Eshach 2006; Flick 1993). Constructivism as a theory has been influenced by many people, but is probably most associated with Jean Piaget. Constructivism argues that humans generate knowledge and meaning from their personal experiences. Field trips are fundamentally a personal educational experience, therefore for educators wishing to study informal learning theoretical constructivism is of obvious relevance. Constructivism emphasises students' personal experiences and is thus influential when regarding the active learning that takes place during the field trips at Loch Lomond. The theory of constructivism contrasts with the traditional telling and demonstrating educational methods which have their origins in Locke and other empiricists and whose ideas represent a positivist view of knowledge and learning. Constructivism holds that students gain new knowledge by associating careful observations with new terms, an association which most agree should happen on all good field trips. Flick (1993).

It is interesting when regarding the attitude dimension of Flicks three dimensions of learning that Germann (1988) found that children with more positive attitudes toward science show increased attentiveness to classroom instruction and participated more in science activities. Weinburgh, (1995) investigated Germann's findings and found them to be true and also found that a stronger correlation between achievements in science and attitudes toward science was found in girls than boys.

2.5.3 Social Constructivism

To understand knowledge attainment it is important to understand each of the dimensions of learning. Constructivism has been shown as a useful theory for understanding Flick's knowledge dimension and can also be used to help investigate the dimensions of attitude and skills; however constructivism is also not the only tool available. As mentioned by Germann and Weinburgh attitudes to science are very influential in regards to knowledge attainment. The ideas of social constructivism helps educators understand the attitudes the can affect knowledge attainment. In contrast to the more cognitive constructivism described previously, social constructivism views knowledge as primarily a cultural product (Vygotsky, 1978). During a field trip Vygotsky (1978) suggestion is that, "an interpersonal process is transformed into an intrapersonal one." Vygotsky argues that every capacity in the child's cultural development appears twice: first, on the social level, and later, on the individual level. Social constructivism suggests that attitudes which affect knowledge attainment on field trips are the result of the culture and society from which the student originates; the social events on a field trip can interact with the individual personal histories of the students and thus enhance or hinder knowledge acquirement. It is beneficial for educators wishing to understand informal education to comprehend the theory of social constructivism and interpret its ideas to help understand the role that attitudes have in regards to knowledge attainment on field trips.

Understanding the skills dimension of knowledge attainment noted by Flick (1993) can be enhanced by a theoretical understanding of constructivism in much the same way as the dimensions of knowledge and attitude have been. Hands-on science encompasses the skills sections of Flicks' theory. Flick (1993) notes that the ideas within hands-on science draw their philosophical support from theoreticians such as Piaget, Dewey, and Bruner who collectively represent a constructivist view of knowledge and learning. Understanding the skills dimension of hands-on learning includes appreciating the development of bodily kinaesthetic skills as well as the training of the senses. Comprehending hands-on science either through constructivism - or through more specific hands-on learning theories - helps educators to understand how

new skills are learnt on a field trip which in turn gives a better understanding of the attainment of other dimensions of knowledge during the educational excursion. Flick suggested three theoretically dimensions through which it is important to understand field trips: knowledge, skills and attitudes; however it is also valuable to look not just at these specific educational dimensions but also at any other major theoretical themes regarding informal learning.

Brody's study (2005) found that curiosity or intrinsically motivated learning; multiple modes of learning, the exploration during the learning process and finally the existence of self-developed worldviews, models and prior knowledge among participants were all major theoretical themes regarding informal learning. To understand why Brody's theoretical themes are important and to help put some of the philosophical theories looked at into practice some educators have come up with theoretical models that can be utilizing to help explain knowledge attainment on field trips. Two of the models that are of most interest to this project are Orion and Hofstein's (1994) 'Three Factors Model' and Falk and Dierking's (2000) 'The Contextual Model'.

2.5.4 Learning Models – The Three Factors Model

Orion and Hofstein's (1994) 'Three Factors Model', lists a number of factors that influence learning during scientific field trips in natural environments. The grouping of these factors into three overarching dimensions is of a similar structure to the work of Flick's (1993) theory on the dimensions of science learning. Orion and Hofstein's (1994) model lists their three factors that influence learning during a science field trip as: teaching factors, field trip factors and student factors. 'Teaching factors' as the name suggests are aspects of the trip influenced by components such as the location of the field trip in the curriculum structure, didactic methods, teaching and learning aids, and the quality of teachers present on the excursion. Field trip factors are those such as: the learning conditions presents at each learning location, the duration and attractiveness of route between locations and also environmental factors such as weather conditions during the field trip. The final dimension of Orion and Hofstein's model is student factors. Student factors

concern elements such as: participants' previous knowledge of associated topics; their previous acquaintance with area in question, any previous experience with field trips, previous attitudes to subject matter, previous attitudes to field trips, and finally class characteristics (e.g. year, size, and subject).

Orion and Hofstein's (1994) model is useful in that it addresses and categorizes many of the factors that affect educational attainment during a field trip. The model takes into account Eshach's (2006) belief that a good model cannot ignore the preparatory and post-visit activities of a field trip as well as introducing the aspects of the physical factors of a trip – such as weather – that can have a surprising impact on scientific educational attainment, aspects which are often overlooked by educational researchers. The model while useful, does not however delve as deeply into the affective and cognitive axis of human behaviour as Falk and Dierking's Contextual Model, the model which will now be looked at.

2.5.5 Learning Models – Contextual Model

Falk and Dierking's (2000) 'Contextual Model' aimed to understand museum education. In their model the authors regarded learning as,

> "an effort to create meaning to survive and prosper within the world; an effort that is best viewed as a continuous, never-ending dialogue between the individual and his or her physical and socio-cultural environment" (Falk and Storksdiec 2005).

The eleven key factors that affect knowledge attainment identified by the authors are once again split into three contextual domains, this time identified as: 'personal, socio-cultural, and physical'. Falk and Dierking contend that if any of these principles are neglected then creating meaningful educational events becomes more difficult.

Falk and Dierking's personal context represents the accumulation of the student's personal history that the individual carries with him/her into a learning situation. Regarding the personal context perspective Falk and Dierking argue that one should expect learning to be influenced by: motivation and expectations, prior knowledge, interests, beliefs and the levels of choice and control available to the student. Falk and Dierking's views on the social context are that people are naturally social in cultural settings and therefore educators should expect museums (and other places of informal learning) to always be "socio-culturally situated". Learning regarding this context is influenced by "inter-group socio-cultural mediation" as well as "facilitated mediation by others" Falk and Dierking's (2000). Finally Falk and Dierking argue, through the physical context dimension, that learning which occurs within the physical environment is in fact, "always a dialogue with the environment". Consequently, Falk and Dierking argue that on a field trip a participants learning is influenced by the following environmental components: any advanced organizers and orientation, the design of the location and also the level of reinforcing events and experiences outside of the museum.

2.5.6 Variable Learning Factors

Neither of the two models looked at are models in the 'scientific' sense of the word as they do not predict learning outcomes. However they are important to look at in regards to fact that informal learning is always a complex process which is situated within a changing series of contexts. Predicting learning outcomes for informal education - and field trips in particular – is harder than with formal education as many of the variables that affect field trip learning a specific to the student, location and educator. Falk and Storksdiec (2005) listed eleven different variables that they believed affected learning outcomes:

> "1.Motivation and expectation. 2. Prior knowledge. 3. Prior experiences. 4. Prior interest. 5. Choice and control. 6 Within group social mediation. 7. Facilitated mediation by others. 8. Advance organizers. 9. Orientation to the physical space. 10 Physical environment. 11. Design of exhibits (quality and exposure)". (Falk and Storksdiec 2005)

From their data analysis Falk and Storksdiec (2005) discovered the above factors that influence educational attainment; however they also concluded that while all of the aforementioned factors were shown to individually influence learning outcomes there was no single factor that was capable of adequately explaining visitor learning outcomes across all visitors.

2.5.7 Summary

In this section some theoretical ideas were investigated as well as some of the models that educators have proposed to help researchers understand the informal educational process. Knowledge attainment on a field trip has been shown to be an incredibly complex process with many competing factors influencing the level of learning that happens on both on an individual and a group level.

The different dimensions of learning and the importance of investigating a field trip from its conception were mentioned. Studies such as Ayres and Melears, (1998) and Ramey-Gassert et al., (1994) have argued that students gain extremely valuable learning outcomes from field trips with other researchers such as Rennie, (1994) and Wolins et al., (1992) finding that the knowledge which is attained whilst on a field trip persists well over time.

In order to address the research question of how do we bridge informal and formal education this literature review has looked at many different aspects of a field trip: why educators should leave the classroom, how educators should structure an effective field trip, the uses of terminology such as informal non formal and formal and finally how knowledge is attained on a field trip. By understanding the current literature regarding these areas it is possible to build up a body of knowledge to assess what makes a good field trip, how best to achieve the valuable learning outcomes suggested by researchers and finally how to get the educational ideas conveyed on a field trip to persist over time. However, whether or not Loch Lomond and

Trossachs national park achieves this at present is open debate, therefore it is crucial to understand what the current educational activities are in the park and how they relate to issues raised in this review.

3 Methodology Section

To investigate fully the current situation regarding informal education at Loch Lomond and Trossachs national park it is vital to have a conceptual framework that facilitates the understanding of the current informal educational practices at work in the park. However, as important as a solid theoretical foundation is the implementation of appropriate methods and tools that allow the investigation to both analyse the theoretical postulations and deal with the facts on the ground. In this section we shall first look at the theory behind this investigation and the roles that Grounded Theory, Activity Theory and Social Constructivism have in helping us make sense of the bridging of informal and formal education at Loch Lomond. Next the methodology and methods section will highlight how the use of qualitative data collection and the implementation of Phenomenography will allow an evaluation of the Current educational practices at Loch Lomond. Finally the tools used to carry out the qualitative data collection such as the semi-structured interviews and participant observation will be described and explained.

3.1.1 Theoretical Framework

The project is an exploratory interpretive constructivist project. To clarify this statement it is important to briefly return to the aims of the project. The investigation aims to discover how we can bridge informal and formal education at Loch Lomond and Trossachs national park. To answer this we must explore what the current informal educational activities are in the park as well as the formal educational activities that the students have come from and shall be returning to. The project is of an exploratory nature as nothing similar to the project has been carried out at Loch Lomond and Trossachs national park.

While there is a body of knowledge regarding outdoor education teaching in national parks it is primarily focused on North American research. For a variety of reasons, such as a difference in scale, physical factors and political organisation, not all of this research is relevant in a Scottish or British setting. Therefore an

important aspect of this project is to explore current informal educational thinking in a local Scottish setting. The project is interpretive in its manner as it deals with the feelings and experiences of the visiting teachers and the educational staff at the park. Finally the project has been designed as a constructivist endeavour and attempts to interpret these experiences in ways that might inform this investigation. The ideas of social constructivism and the belief that the community and social structure behind an individual play an important role in a person's educational experience have greatly influenced the designing of this project. The thoughts of the interviewees on these communities, and on the over all project aim of investigating the bridging of informal and formal education, has allowed the construction of this thesis which combines the findings of educational researchers specialising in the subject of informal education and the personal experiences of educators involved at Loch Lomond and Trossachs national park. Having briefly discussed the theoretical overview of the project it is now important to look more closely at the relevant theoretical ideas examined by this investigation.

3.2 Grounded Theory

As mentioned, this project is of an exploratory nature. Therefore an area of theory that is important for this project is 'Grounded Theory' (Martin 1986). Grounded Theory is an analytical qualitative research method that proposes the generation of theory from data produced through research. It operates in a way that can be seen as almost the reverse of 'traditional' research in that it advocates the collection of data without the prior formation of a hypothesis. Once the data is collected – in the case of this project through semi-structured interviews – relevant aspects and concepts from the transcripts are marked with codes allowing the development of categories into which the data can be sorted. From these categories it is then possible to develop a theory explaining the data and from there produce a hypothesis. One of the problems with educational research is that often you're dealing with complex situations and theory is often specific to subsets or situations. Consequently Grounded Theory and Activity Theory were utilized for their descriptive elements as well as their inferential qualities.

As of yet no studies have been found by the author which investigate the bridging of informal and formal education at Loch Lomond and Trossachs national park. Consequently it is impossible to produce a hypothesis to test during this investigation as there is currently little literature and data on the subject. Utilizing the ideas of Grounded Theory is a way to deal with this lack of data. Through semi-structured interviewing of the visiting teachers and park educational staff a body of data was collected which allowed the later development of a theoretical understanding of precisely what is currently happening in the park in regards to bridging formal and informal education.

However, while there is little literature available on the current situation regarding bridging formal and informal education at Loch Lomond, there is some relevant literature regarding outdoor education in similar settings. From this literature – mentioned in greater length in the literature review chapter - some expectations of what is happening at Loch Lomond regarding informal education can be deduced. From the literature review one theory, which is of great interest for this project, is the educational philosophy of Activity Theory, which seeks to explain issues regarding the roles of the students' educational environment, communities and utilization of learning tools.

3.3 Activity Theory

In social science research theory can help the researcher in several ways. Halverson (2002) has argued that Activity Theory possesses a descriptive power, a rhetorical/inferential power and finally that it can lead to a practical application of these inferences. Activity theory is a psychological paradigm that has its foundations in seeking to understand human activities as complex socially located experiences. Developed by Soviet thinkers such as Vygotsky, Luria and Leont'ev, Activity Theory came to the attention of the west relatively recently. Developments of more modern schools of Activity theory - such as Scandinavian Activity Theory - resulted from the combination of Soviet cultural-historical psychological thinking and

western developments such as Cognitive Science and Constructivism. Fundamentally Russian activity theory held two main principles:

1) Consciousness and activity are unified

2) The human mind is of a social nature.

The first idea is that the mind arises, exists and can be understood only in the context of the "subject-object relationship" (Kaptelinin & Nardi 2006). This means that the human mind is fundamentally related to processing interactions between our environment and ourselves. Therefore in order to understand the human mind we also need to understand the surrounding world in which it operates and not examine the mind independently. The second idea states that society and culture are not external factors influencing the human mind but rather are forces directly involved in the production and development of the human consciousness. This idea means that a person is not a clone of the culture and society from where they came but is instead a mixture of cultural and "personal senses" that are individually specific (Kaptelinin & Nardi 2006). The importance of Activity Theory's ideas on culture and society in regards to the work being carried out at Loch Lomond will be looked at later in this section but for now it is important to explore Activity theories ideas on the subject-object relationship and what precisely "activity" means to Activity Theorists.

3.3.1 What is 'Activity'?

In their 2006 paper 'Activity Theory in a Nutshell', Kaptelinin and Nardi state that,

> "Activity is understood as a purposeful interaction of the subject with the world, a process in which mutual transformations between the poles of 'subject-object' are accomplished." (Kaptelinin & Nardi 2006).

This idea of activity as a deliberate synergy is central to activity theory. In the context of activity theory "subject" generally refers to the individual or in occasions a group and "object" refers to the final goal that the subject is pursuing through their activity. Kaptelinin and Nardi argue that human activities are always directed towards objects; for example people learn, sell or design "things". People do not design entities for no purpose or reason.

Activity theorists also argue that in directing their activity towards objects, subjects also in turn direct feelings and emotions. As Activity Theory has been designed as an attempt to understand aspects of human psychology, certain established ideas regarding consciousness and activity have been suggested. Jonassen & Rohrer-Murphy (1999) argue that Activity Theory focuses on the dynamic relationship between activity and consciousness. They further argue that consciousness is the result of everyday practice; that consciousness and activity are mutually supportive, and finally that purposeful actions are only realised through conscious intentions. These beliefs are important to consider when regarding education. If activity theorists are correct then the consciousness of everyday practice (education) is supported by active learning. Therefore, students theoretically benefit greatly from active learning and from taking part in an educational pursuit, which requires active participation. It is this learning which was examined by this project investigating field trips to Loch Lomond.

3.3.2 Changes Over Time

Another idea of activity theory is that constituents of activities are not fixed but instead are dynamic and that human activities exist historically (and evolve) over time (Kaptelinin and Nardi 2006). This is interesting from an education perspective in that the activities the subject chooses in order to pursue their object (goal) may change over time as the subject learns more about the object and themselves. Developmental changes in the subject which result from participating in activities and are determined by the nature of these activities may cause substantial changes in the subject's properties. From analysing the

activities present in a situation educators can open up a possibility of properly understanding both subjects and objects.

For the investigation these ideas were utilized when looking at the structure of the field trips and at the knowledge attained whilst on the trip. Many of the educators at the park have been working there for a number of years. By looking at their attitudes towards the changes they have witnessed regarding informal education over the years, one can argue, for example, it is possible to understand the developmental changes in their educational thinking and practice which have resulted from participating in outdoor activities.

3.3.3 Understanding Activity

Activity Theory proposes that 'activity' can be regarded as the basic unit of analysis. By understanding the activity researchers can then understand both the subjects and objects - an understanding which could not be achieved by focusing on either independently. It is perhaps easiest to understand the activity theories ideas through the example from Loch Lomond of a student carrying out a geographical survey into path erosion. The student is regarded as the subject with the geographical survey described as the object. To survey the path erosion present at a particular location the subject must carry out a variety of activities such the pre-reading of geographical guidebooks, selecting the right materials, choosing the right site etc. The subject object and activity are in a constant state of interaction. The manner of the path erosion survey changes according to the desire of the student, however the person will also be changed by the surveying in that the person shall encounter new experiences – for example using the tools outdoors for the first time - which will change their desires. Both of these will affect and be affected by the activities pursued. By understanding the changes to the activities and the way the subject pursued the object it is possible to gain an insight into learning processes experienced by the subject. The challenge for educators is how do we go about understanding these activities? How is it possible to tell which activities a subject is using to reach their object?

3.3.4 Tools

Through studying the tools the subject uses to reach their goal, activity theorists argue it is possible to interpret the activities behind the tools. Activity theory acknowledges the special role of culturally developed artifacts with theorists regarding them as,

> "fundamental mediators of purposeful human actions which relate human beings to the immediately present objective world and to human culture and history" (Kaptelinin and Nardi 2006).

People rarely interact with the world directly; vast numbers of artefacts have been developed by mankind to mediate our relationship with the world. By understanding these artefacts, their purposes, design and uses, researchers can in turn understand the relationships (physical and social) within which the person was working, helping to explain their thinking process to outsiders. Another important reason for looking at tools is that artifacts usually reflect the experiences of people who have tried to solve the problems before the current user. These people and those that have followed them have invented or modified the tool in order to make it more effective or efficient in its job.

The experiences of our predecessors are accumulated in the properties of their tools, for example how the tool looks and how they're used. Therefore understanding the roles and uses of tools leads to a greater comprehension of the accumulation and transmission of social knowledge. Understanding the tools that a person uses to complete an activity helps us to understand the thinking behind the individual thus unlocking their mental processes. Additionally correctly understanding a tool also reveals the thought processes of the person predecessors. While at first these thoughts may seem abstract in regards to outdoor education at Loch Lomond it should be noted that very few educators when they teach students out doors do it in the traditional passive learning style. A greater emphasis is placed on active learning outdoors with projects

and investigations allowing students to work in their own way. The thought processes that students use to design and carry out their projects, the ways they choose to collect data and process their results can be seen through the tools they uses to achieve their goals.

3.4 Understanding Learning

Understanding the mental processes which constitute learning is one of the great challenges for educational researchers. With learning internalized in the mind of the student, researchers have to look for clues in the behaviour and words of their subject to understand their thinking. To investigate the bridging of informal and formal education at Loch Lomond it is crucial to understand how students are learning in the park and if the way in which they are learn differs from traditional classroom learning. Activity Theory suggested that by looking at the way a student approaches an object and what tools they use during the activity to reach this object we can understand their thinking. By comparing this thinking with how the same students perform activities within formal learning environments then it is possible to compare the way individuals or groups learn in different situations. Activity Theory also emphasises that learning changes over time and that the communities surrounding students (both social and physical) can have profound influence on individual learning. It was due to these ideas that Activity Theory played an important role in the methodology of the project.

3.4.1 Internalization

Empirical studies of higher psychological functions showed that in many cases subjects who used external meditational artefacts to solve a task spontaneously stopped using these artefacts and improved their performance (Kaptelinin and Nardi 2006). Vygotsky (1983) described this phenomenon in terms of internalization. An example of this can be seen in teaching children to count. To begin with children start counting using an abacus or number rule; later they count out loud and finally children count solely in their

heads. The point at which the student changes between these states is of great interest to educators as it provides a guide to the subject's levels of comprehension. It was interesting for the project to consider this thinking in regards to informal and formal education and to investigate if there is a difference between the two spheres of learning, for instance did the educators believe children grasp certain concepts better outdoors or in formal education? It was then useful to discover that if there was a perceived difference in the learning environments then why did the educators interviewed feel this was the case.

3.4.2 Psychological Tools and Externalisation

Vygotsky introduced the notion of psychological tools into Activity Theory. Returning to our path erosion survey metaphor, you could look at the physical tools being used by the subject to survey the path erosion (object). However, investigating the maps, tape measures, recording equipment etc used in the surveying would not give you the entire picture of the thought processes going on inside the subject as they progressed with their activity of surveying. To give a better understanding of the subject's thought processes researchers would also have to consider the internal psychological tools used by the subject. How are they communicating with the others in their group? What is the desired final outcome to look like? Psychological tools can be both physical artefacts (maps, art, blueprints etc) and symbolic systems (languages, numeric systems).

Activity Theory states that internal activities cannot be understood if they are analysed in isolation from external activities due to the mutual transformations between the two kinds of activities (Kaptelinin and Nardi 2006). How a person uses a psychological tool, such as communication, will be the result of their experiences using their physical tools such as maps or task instructions. Changes to the maps or instructions will change how the subject describes the survey and changes in the subjects communication will in turn change the appearance of the maps and instructions for the subject's future.

Internalization shares much with the traditional cognitive science notion of information processing, however externalization is not emphasised in cognitive science. In people externalization is important when an internal action needs to be rethought or scaled up or down (Kaptelinin and Nardi 2006). During the process of informal education knowledge from the classroom often needs to be re-evaluated as a result of the student being in a new setting. Outdoor education involves students experiencing phenomena on a larger scale than ever possible in the classroom. This can lead to a re-evaluation of ideas with students having to rescale their knowledge. Tools facilitate this scaling and rethinking, resulting in externalization. Therefore it was important for this project to not only consider internalization - when students grasp an issue to the extent they abandon supportive tools - but also moments of externalization where the educational setting causes a re-evaluation of thought and the reimplementation of supportive objects.

3.5 Ideas Around Community

Modern Activity theorists such as Yrjö Engeström and Wolff-Michael Roth have advanced Activity Theory from its grounding in subject - object - tool interactions by the incorporation of ideas regarding the community and social structure within which the activity takes place. Engeström (2001) proposed a scheme of activity with three interacting entities—the individual, the object and the community—instead of the two components—the individual and the object— in Leont'ev's in original scheme (Leont'ev' 1981 cited Engeström 2001).

Bringing in ideas of social constructivism is interesting in regards to this project as the cultural and social setting of the learning that is taking place at Loch Lomond is very important. The educational activity happening at Loch Lomond is affected by the social setting of the field trip with its informal learning environment emphasis on group work and the lessening of traditional teacher pupil boundaries. However the educational activities performed at Loch Lomond are also affected by the physical setting of the trip. Learning in an area of outstanding national beauty will affect the learning activities the students engage in -

it affects how they act, think, the speed at which they learn and how they carry out their learning. Engeström encapsulates this belief in his statement that,

> "Any activity system can only be described in the context of the community in which it operates" (Engeström 2001).

This point is of particular interest to this project with its focus on understanding and bridging of formal and informal learning communities present at Loch Lomond.

Roth (2006) purposes that educational communities formed out of school have different properties to those formed within formal education. A particularly interesting point regards the educational goals of individuals within informal learning environments such as Loch Lomond. Roth argues that within school based group activities all pupils are essentially a,

> "monad… existing nearly independently of all other monads. Individual success is valued and rewarded above the success of particular others (individuals) and generalized others (collective). The accomplishment of each student is irrelevant to the success of the collective and vice versa." Roth (2006)

However in informal learning situations Roth argues that,

> "Objects of activity are the result of a division of labor, which ultimately contributes to the maintenance of the society just as it mediates the maintenance of individuals. Differential participation by individuals increases the overall action possibilities and control over life conditions". Roth (2006)

These ideas are interesting to consider within the context of the national park and its informal learning environment as field trips consist of a group from a formal learning location interacting and learning

through informal means and establishing temporary educational communities working on shared goals. Whether pupils regard the work of other field trip members as beneficial to their collective effort or whether – in the in the case perhaps of worksheets – they perform essentially the same work and are assessed against the results of their fellow group members is an interesting point for informal education research to consider.

3.6 Internal Contradictions

A final point which is interesting regarding Activity Theory is the idea of internal contradictions as being the driving force of change and development in activity systems. This was first proposed and conceptualized by Il'enkov (1977, 1982). Recently Il'enkov's ideas have been further developed by researchers such as Gutierrez (Gutierrez et al., 1995; Gutierrez et al., 1999) who have identified the idea of 'third space'. The 'third space' is a concept which Gutierrez et al believed accounted for events in classroom discourse where the,

> "seemingly self-sufficient worlds and scripts of the teacher and the students occasionally meet and interact to form new meanings that go beyond the evident limits of both." Gutierrez et al. (1999)

The idea of a third space and of Il'enkov's (1977, 1982) idea of internal contradictions as the driving force of change will provide an interesting framework for this project. Outdoor education at Loch Lomond contains not the two worlds of Gutierrez et al's work (student and teacher) but three or possibly more spheres of education; for example there are the worlds of the teachers, the students and the park educators. As these worlds interact on a field trip within a relatively short period of time Il'enkov's idea of these differing spheres as being the driving force of change was interesting to investigate during this project.

As mentioned in the literature review much research has focused on the 'novelty effect' of field trips with new stimuli and interaction of the differing spheres of education having both beneficial and detrimental effects on student learning. Investigating whether the conflicting educational spheres of teaching and

setting are productive or restrictive was an important aim of the project and for assessing the bridging of informal and formal education.

3.7 Putting Activity Theory Into Practice

Activity theorists argue that any analysis of the mind should also include an analysis of the interaction between human beings and the world in which the mind is embedded (Jonassen & Rohrer-Murphy 1999). Taking this as our theoretical framework for investigating the bridging of informal and formal education requires that this project does not look at learning on a field trip in isolation but instead seeks to understand the complex interactions which happen on a field trip and affect the way a student's brain interprets and understands their learning experience. The challenge however for this project was how to test the ideas and principles of activity theory in a practical setting.

Activity theory itself does not prescribe a single method of study. It only suggests that the methodology be chosen based on the research topic in question. Unlike approaches based on a particular method such as contextual inquiry, activity theory starts from the problem and then moves to the selection of a method. There were however some guides within activity theory, which helped with the planning and implementation of a constructive methodology.

To begin with activity theory necessitates a qualitative approach to data collection. Studying people's feelings on their surrounding environment and how they perceive their learning environment cannot be done through purely statistical data analysis. In the complex learning environment of a field trip to Loch Lomond spheres of informal and formal learning interact to varying degrees from person to person, from trip to trip. The only way to understand what is happening on these excursions is I believe through semi-structured interviews. The semi-structured interviews performed during the project allowed the stake holders in the educational experience present at the park - the visiting teachers, the park rangers and educators - to explain what they believe is currently occurring in the park. The semi-structured interviews

performed at the park also provided some freedom for the interviewees to expand on the topics they feel are important yet they also provided some structure so that it was possible to compare the feelings and comments of the different interviewees on similar topics.

It was important that the project commits to understanding the activity system at Loch Lomond from as many different perspectives as possible. That is why in this project the interviews included not just the visiting teachers thoughts on their classes learning experiences but also the views of the rangers and park educational staff who were presenting and lecturing to the visiting class.

The combination of semi-structured interviews of the parties involved in learning at Loch Lomond and participant observation of the excursion will allowed this project to tackle the aims of this project:

- Why are teachers and school parties visiting the park's informal learning environment?
- When the field parties are at the park what are the variables that affect learning?
- How are field trips to the park structured?
- How is knowledge attained on a field trip?
- How does the informal learning facilitated at the park connect with the new Scottish Curriculum for Excellence?
- What are the strengths and problems regarding informal learning at Loch Lomond and Trossachs national park?

Utilizing the ideas and theoretical framework of Activity Theory provides a means of framing and focussing upon these big questions. Investigating the group interactions on a field trip, considering the roles of the interacting educational "worlds" of formal and informal education on the excursions, examining the subject - object - activity relationship and looking at the tools the visiting students use to facilitate these activities allowed this project to probe these fundamental questions.

3.8 Phenomenography

Understanding what happens on an 'average' field trip can be a challenge as different people experience the same event in individually distinct ways. An important aim of this project is to understand what happens on a field trip to Loch Lomond, what the strengths and weaknesses of the trip were and what learning took place. In order to investigate these aims it is integral for the project to talk to the rangers and educational staff who provide the field trips and ask them for their thoughts on what a typical field trip to Loch Lomond entails. This information can then be understood through the theoretical framework of activity theory to provide a guide to the learning that takes place during a trip to Loch Lomond.

However taking an 'average' view only gives you half an answer. As many people who work with young people know, what happens on an 'average' field trip or even what should happen on an average field trip can often be quite different to what happens when your group arrived. It was therefore important for this project to not just include the thoughts of the park staff as to what a typical field trip entails but also to speak to the teachers who visited to see if what happens 'normally' on a field trip was indeed what they themselves experienced.

Treating every trip to loch Lomond as an individual learning event full of specific strengths, mistakes and challenges would allow for an accurate analysis of only that trip. The challenge for this project was to incorporate the specifics of the individual trips undertaken by the separate school parties yet also understand the compilation of the information from these trips to allow for some sort of extrapolation of what a general field trip entails. This allowed for the analysis of wider trends. The method used by the project to achieve this was the qualitative approach of phenomenography.

Marton & Booth, (1997) describe Phenomenography as,

> "a method and accompanying set of theoretical assumptions that seek to identify variation in the ways people conceive of and approach learning-related experiences" (Marton & Booth 1997).

Previously Marton (1988) has also stated that,

> "Phenomenography seeks to holistically describe how individual learners conceive of a particular experience, so that the full range of possible conceptions is described" (Marton 1988).

A strength of phenomenography is that unlike participant observation it not only seeks to interpret what people do, but also what they think. In the case of Loch Lomond performance on a field trip is not all we wish to measure, it is important to understand what a class of children on a school trips are thinking as much as what they are doing.

Through interviewing the educational staff at Loch Lomond it is possible to envisage what a 'typical' or 'ideal' field trip entails. Using this as the standard idea of what the teachers should expect from their trip allows the teachers' individual experiences to be quantified. Looking phenomenographically at the differences between what the teachers experienced on their trip and what they 'should' have experienced on an average trip gave the project an idea of the variation between the educational aims, goals and experiences of both the informal and formal parties.

Phenomenographic work provides us with a profile of the variation in experience across all of the adult participants in the program. While it would undoubtedly be useful to also include the variation of views of the children involved on the field trip the numbers of children required to be interviewed and the time available to conduct this project rendered this impossible. Therefore the interviewing of the teachers and park staff was used to provide a guide to the feelings of the many school children who have visited the park. Entwistle, (1997) states that,

> "Phenomenography is, above all, a practical tool for improving education: The perspective it offers on differences in learning experience can enable educators to more deeply understand why and how their learners struggle, and how this struggle might be overcome." (Entwistle 1997)

This quote explains why phenomenography's ideas were utilized for this project. To understand how to bridge informal and formal education its is first important to understand where they are disconnecting and where learners are struggling. Through looking at the differences in what should have happened on a field trip to Loch Lomond and what the educators found to be happening we will have a guide as to what conflict exist in the transition between learning environments.

3.9 Semi-Structured Interviews

Semi-structured interviews were chosen for the project for their ability to question the participants about certain areas of their field trip that were of particular interest to the project yet still allow the interviewees the freedom to discuss areas that they thought were important but perhaps not covered in as much detail by the interview questions as the participant would have liked.

Originally the project intended to interview pupils, teachers and the park education staff. However due to constraint on time and resources and the sheer number of children visiting the park it was decided that the project would focus on the teachers and park staff only. A reason for this is that teachers have a good knowledge of the educational strengths and weaknesses of their students on both a personal and group level. Therefore interviewing the educators in depth provided a strong indicator of the experiences of the children participating in the visits and also fit into the short time frame available for data collection.

Interviewing the teachers and park staff was important in allowing the project to address its aim of discovering how to bridge formal and informal education. The questions designed for the interviews (provided in appendix 1) seek to answer the projects main issue by gathering information about smaller questions that will let us answer the larger questions.

- As previously mentioned the project aims to answer the following questions:

- Why are teachers and school parties visiting the park's informal learning environment?
- When the field parties are at the park what are the variables that affect learning?
- How are field trips to the park structured?
- How is knowledge attained on a field trip?
- How does the informal learning facilitated at the park connect with the new Scottish Curriculum for Excellence?
- What are the strengths and problems regarding informal learning at Loch Lomond and Trossachs national park?

The semi-structured interviews utilized in the project were designed to answer these questions. The list of interview questions provided to the visiting teachers questioned the participant on their field trip, its size, time and purpose. The reason for this and the similar questions asked to the park education staff is to provide an insight into the scale of the excursions happening at the park.

Asking both the rangers and the teachers what educational activities they've experienced on their excursions is designed to discover to what degree the park offers a generic field experience and to what extent the each trip is individually tailored. Good field trips should be designed to meet the desires of the visiting school parties, however this can be problematic as it relies on effective pre-visit communication. Also a national park has limited time and resources so it may not be able to design a unique learning experience that individually suits each school party. Whether this was the case with Loch Lomond was interesting to find out.

Finally, asking park staff and teachers to describe in their own words their field experiences allowed for an analysis of how their trips were structured and how knowledge was attained on the field trip. Sometimes there can be a discrepancy between what the excursion organisers (either teachers or park staff) believe they have structured and are facilitating and what the participants on a field trip are actually experiencing. The interviews performed for this project aimed to discover if this is the case at Loch Lomond.

From the literature search there has been much theoretical (and some physical) research into the role of the novelty effect and how the use of an unfamiliar setting affects children's ability to learn. From studying Activity Theory's ideas, and also the studies of Falk & Bailing, (1982); Falk, Martin, & Bailing, (1978); Kubota & Olstad, (1991); Martin, Falk, & Bailing, (1981) it has been argued that new unfamiliar learning situations can be both productive and ineffective. Asking teachers and rangers if they are aware of the novelty affect and if they have taken any steps to combat this helped answer the debate on the use of new educational stimuli. Investigating the steps taken to combat the novelty affect will helped the project evaluate the effectiveness of their visit by seeking to discover how the students related their informal educational experiences with their curricular teaching after returning to their formal learning environments. Examples of the interview questions to both park staff and educators are provided in appendix 1.

4 Results and Discussion

The results and discussion chapter will look at the findings from the interviews in regards to the project's aim of understanding the bridging of formal and informal education. This chapter is arranged in six sections with each section addressing one of the six research questions which together allow us to understand the bridging of formal and informal education at Loch Lomond and Trossachs national park. The six research questions are:

- Why are teachers and school parties visiting the park's informal learning environment?
- When the field parties are at the park what are the variables that affect learning?
- How are field trips to the park structured?
- How is knowledge attained on a field trip?
- How does the informal learning facilitated at the park connect with the new Curriculum for Excellence?
- What are the strengths and problems regarding informal learning at Loch Lomond and Trossachs national park?

Each of these questions will form a section of this chapter with the emergent themes from the data collection for the project addressed in their own subsections. Issues arising from the literature review will also be looked at in this section in regards to outdoor learning in the national park. This will help to answer to what extent educational strengths and problems at the park are site specific and how much they fit into the larger academic picture discussed in the literature review.

As discussed in the methodology section understanding each of the six research questions individually allows this project to develop an insight in the crucial components that constitute the issue of bridging formal and informal education. The division of the chapter into these six areas allows emergent themes and issues to be found easily. However the divisions are not definitive and some themes appear in more than one chapter. This is a reflection of the many interacting factors that are present in informal education. In

some cases certain themes transcend these boundaries as issues for instance with the new curriculum can affect the structure of a field trip or the specifics of knowledge attained, however to avoid repetition they will, where possible, be analysed in depth in only one section.

During the project nine key educators involved in outdoor learning at the national park were interviewed. Six of the interviewees were involved facilitating field trips to the park and were members of the national park organisation. The remaining three interviewees were teachers who had visited the park and were interviewed to provide an insight into the views of formal educators who utilize informal educational locations.

During the investigation the park's education programme was found to possess a loose organisational structure in regards to outdoor education. This provided the educators interviewed with a high degree of personal freedom in how they organised and facilitating their individual informal learning activities. This resulted in rangers working largely in areas of personal preference. While the positives and negatives of this will be looked at later in this report it is important to mention this at the start of this section as the high levels of ranger autonomy affected all aspects of the data collected.

The literature review began with an investigation in the academic findings regarding why teachers leave the classroom with their students. Through the interviews with educators undertaken for this project it is important to return to these ideas to compare and contrast this reports findings of why teachers visit the national park with other academic findings regarding the reasons that teachers organise field trips.

4.1 Why Leave The Classroom?

One of the first issues looked at in the literature review regarding the question of why should classes leave the classroom was the idea that travelling to an outdoor location can allow educators to show objects or phenomena that are perhaps too large, complicated or impractical to show in detail in a classroom. It is

interesting to note that from the research conducted for this project that this was an issue that was brought up by both visiting teachers and park educational staff. Quotes 1 and 2 come from a visiting teachers asked to explain why they chose to leave the classroom and organise a field trip to Loch Lomond and Trossachs national park.

> "We wanted to identify glacial landscapes getting them to actually look and pick out corries and sort of U shaped valleys and also looking at land use in the area and sort of conflict issues and just experiencing what goes on in the national park and what the national park aims and what are the duties are of the national park rangers." (Teacher 1 Quote 1)

> "Well the main kind of focus seemed to be conflicts, land use conflicts, we did a lot of that, you know looking at vandalism or the use of speed boats; of just the different users of the park you know how they conflict." (Teacher 2 Quote 2)

Both of these quotes illustrate the fact that the subject areas the teachers focussed on (geological features, vandalism, speed boats, conflicts between park users) during their field trips were areas that are impossible to show in a school environment. Their ideas are given further backing by information provided by a third teacher who said the following:

> "...it [the field trip] reinforced what we were doing in the class and gave them different aspects. It's given them the chance to actually see things that I wouldn't of, you know we can talk about it show them a video of it, of areas that are littered, but to actually see it, to see the people coming in and to see the potential conflicts there could be and interact with it was invaluable. To actually run their own questionnaires of the facilities that were available and how the managed site had more than the unmanaged was, yeah, extremely valuable." (Teacher 3 Quote 3)

The idea that simply showing students a video of an issue isn't enough is an area that will be returned later in the report. Due to practical issues – the interviews were conducted very close to the summer school

holiday – only 3 teachers were interviewed. However as park staff were available over the summer and are also an integral part of the outdoor education performed at Loch Lomond it is interesting to see what their opinions are on the areas visiting school parties focus on and why this is.

> "The things they [teachers] seem to want are land use conflicts, geology and part of that is techniques so you will. They ask for as part of the field trip they have to do a part of techniques, outdoor practical techniques so field sketching is a common one. We have done measurement of path erosion through plenometers and photographs and sketching and filling out forms". (Ranger 5 Quote 4)

> "I've heard a lot of the teachers say to me that there are some questions that kids don't answer that well no matter how much they talk to them about them and read to them about it they really need to come out here and see it, feel it, touch it and so a lot of these groups that is what they are coming out for". (Ranger 6 Quote 5)

Quotes 4 and 5 agree with the ideas suggested in the literature review that educators look for something unavailable in classroom setting. However the rangers also bring in some new ideas. Quote 4 is interesting in that the ranger interviewed mentions that it's not just physical objects which school parties leave the classroom to experience but also they leave to engage in practical activities which are impossible in a school environment. Field sketching geological traits is an important skill for geographers to possess but is a difficult task to teach in a classroom devoid of natural landscape formations. The teaching of field sketching and the usage of plenometers agrees with Orion & Hofstein (1994) findings that the field trip can allow students to interact physically and manipulate objects (e.g. biological specimens and physical phenomena) which are unavailable in their formal classrooms, you can hardly measure path erosion without having a path. Quote 5 is interesting in that the ranger backs up the ideas of the teachers interviewed and of ranger number 5 by saying that many teachers come out to the park to see, feel and touch things first hand. However the ranger also brings in an important idea that passive learning for some educational issues is not enough for pupils to grasp the desired concept. Ranger 6 believes that teachers come to the park because

students need to not only hear about ideas and practical techniques but also to engage with then physically. For subjects like science and geography the only feasible way for students to engage in many practical techniques like measuring path erosion is for the pupils to travel to a site where the techniques are not only required but also utilized.

The idea of leaving the classroom as beneficial for active learning is an idea the cropped up in many of the interviews. In quote 6 a teacher explains briefly what the class did on their trip to Loch Lomond and also their reasons behind organising the trip.

> "Certainly for all field trips there's a number of skills the pupils are going to develop; team work, or you know communication or just you know being in the outdoors and all the benefits of outdoor learning and being kind of hands on and kind of seeing the places physically as opposed to just in a picture. So it was a combination of gaining a greater knowledge but also developing skills from the different activities they had to do in the day." (Teacher 2 Quote 6)

While the teacher interviewed clearly believed that there were many reasons to leave the classroom the fact that being "hand's on" was a reason to visit the national park is one that is important and was mentioned by all the teachers interviewed.

Engaging in practical skills and witnessing phenomena were not the only reason given by teachers for organising a field trip to the national park. Dillon et al (2006) state that,

> "well taught and effectively followed up [field trips], offers learners opportunities to develop their knowledge and skills in ways that add value to their everyday experiences in the classroom". (Dillon et al 2006)

From the interviews performed for this project at the national park 7 of the educators interviewed mentioned that the reason they chose to leave the classroom was because doing so would reinforce their

formal learning and tie in nicely with curricular teaching. Issues surrounding the curriculum will be looked at later in this section. However the idea that a field trip can reinforce formal learning and help to promote a deeper understanding of educational principles is a powerful justification for the need to remember the importance of informal learning and field trips in particular when considering education.

In quote 7 teacher 1 states that the primary reason for the decision to visit the national park with a school party was to revise classroom teachings and to help the children remember the formal educational points they had covered. Quote 8 from teacher number 3 agrees with quote 7 in regards to recapping work covered in school. However for teacher 3 placing classroom teaching into a local context was an additional reason to visit the park.

> "I think it [the field trip] was primarily to recap their knowledge, to sort of embed that knowledge more in the pupils." (Teacher 1 Quote 7)

> "It was a standard grade group. I said the sort of things that I wanted to do, I had given them a sort of heads up on what I had actually covered with the kids beforehand the sort of input that they had before they came out and really it was the case that I wanted to reinforce those in the field with any of the sort of local case studies that they could give me and yeah that worked really well." (Teacher 3 Quote 8)

4.1.1 Connecting Formal Learning with Surrounding Communities

The organisation of a field trip to Loch Lomond involves direct communication between the prospective teachers planning the trip and either the ranger who will lead them or the head of the ranger service. For the visiting teachers plan of recapping student knowledge through informal learning experiences to be successful both rangers and teachers should be aware of this and have discussed their aims with each other. It is therefore important that ranger 4 stated,

> "I try an link them [classroom and outdoor education] together and if there's something that the teacher tells me they are doing in class and it links to what we are doing then we'll try and focus on that". (Ranger 4 Quote 9)

Quotes 8 and 9 are important when looking at Flick's (1993) work, which found that,

> "hands-on activities give students the opportunity to identify with scientific investigators in such a way that they can see continuity between their experiences now and in the future." (Flick's 1993)

By consciously deciding to reinforce their students' knowledge through hands on activities outdoors at Loch Lomond which relate to their classroom pursuits teachers and rangers are building a connection between learning in schools and learning outdoors that has the potential to embed classroom practices deeper in the minds of students than purely passive learning. The positive remark from teacher 3 that this "worked really well" is good example of both Flick's findings and the also of the ability of fieldwork at Loch Lomond national to bridge informal and formal learning. Nevertheless one teacher stating that a single field trip worked for their class is not proof that using informal learning at Loch Lomond to help with formal education is successful every time, however it does show that if conditions are right that it can be done.

4.1.2 Changing Attitudes

There were many reasons given for leaving the classroom mentioned in the interviews: the facilities at the park, the fact the park was relatively close to the school and that field trips help motivate pupils to take the subject. However there are two main reasons given that stand out due to the number of educators that mentioned them and the length at which they spoke. These two areas are leaving the classroom to promote new experiences and positive thinking regarding the chosen subject and also the idea that getting students

outdoors into their community to experience their subject first hand is both socially and educationally beneficial.

Fostering positive attitudes towards their chosen subject is an important aim of any educator. Students who enjoy a subject are more likely to engage in the topics provided by the teacher in class and also to carry out further research themselves in their free time. There is also the complimentary effect that if a class of pupils are enjoying a subject then it becomes much easier for the educator involved to teach them and thus the educator themselves also have a more positive teaching experience.

Findings by Dillon et al (2006), Bogner's (1998) and Orion et al (1996) all found that an effective outdoor programme can help improve student attitudes with Bogner (1998) finding that a field trip "provoked favourable shifts in individual behaviour, both actual and intended". Further research specifically into environmental attitude changes by Ignatiuk, (1978); Keown, (1984); Kern and Carpenter, (1984) and Lonergan (1988) found that outdoor field trips are especially effective in changing student perceptions in this area.

From interviewing various park staff it was found that the majority of the educational trips taken to Loch Lomond are in the fields of natural science and in particularly biology, earth science and geography. There has been an increasing drive both socially and politically to raise awareness of environmental issues and to get people engaging in their natural surroundings. The national park covers an area of outstanding natural beauty so it is likely that the park's location would have some effect on environmental attitudes. However whether this is the case and whether engaging in new experiences and fostering positive attitudes is even taken into account as a reason to leave the classroom and arrange a field trip to Loch Lomond was an important question for the project and consequently an area discussed during the interviews.

Eight people interviewed for the project mentioned changing student attitudes during their interviews with quotes 10 and 11 coming from teacher number 2 who booked an excursion in the park.

> "I think it [the field trip] gives them a greater understanding and when they're doing their exams or sitting in class you know they can attach the memories of that day to what they need to write down. Probably more so because its not as if they do it every week so it's more of a unique experience so they will kind of remember it." (Teacher 2 Quote 10)

> Interviewer: "Did you find any strength's for the informal education provided at the park? Either strength's of the staff or strength's from the settings?"
> Teacher 2 "Yeah I don't think there's much to add. Just what I've said in terms of the pupils gaining a totally new experience, a unique experience in terms of how they're learning." (Teacher 2 Quote 11)

For teacher 2 an important reason to leave the classroom is clearly to give the students a learning experience, which is unique and one that differs from classroom learning. The teacher also believed that engaging children in new learning experiences can help pupils gain a greater understanding of the issue on the day and also make them more likely to remember the issue later during their exams. The idea of having fun while learning was mentioned by another teacher interviewed and by many of the rangers. In quote 12 teacher number 3 describes what happened on their field trip:

> "We'd looked at an unmanaged site north of Balmaha, we looked at the managed site on Inchcailloch, the beach on the far side. There was still a lot of good geography going on but it was also good fun." (Teacher 3 Quote 12)

Educational enjoyment is also mentioned by ranger number 1 – quote 13 – and ranger number 4 – quote 14.

> "I mean I think enjoyment always has to come to do with it because you want it to become a memorable experience. I mean I remember when I had outdoor learning opportunities, it's probably what shaped me." (Ranger 1 Quote 13)

> "Yeah but also I think if you think back to my school days you think how much time did I waste just sitting there not even listening, staring out a window; and probably about half of my school life was just wasted because I was not inspired at all and I'm sure that is the same with the majority of kids." (Ranger 4 Quote 14)

Creating positive attitudes happens when students enjoy an activity, the location or the educator. Both the rangers mention in quotes 13 and 14 highlight the importance of inspiring pupils and how lasting that effect can be. Ranger 4 mentions the amount of time that formal educators can waste with some pupils in attempting to teach the students in ways that don't engage them. Ranger 1 mentions that inspirational outdoor learning shaped them into being the person they are today. Inspirational teaching can be due to what activities the students pursue – which will be looked at in more detail in the knowledge attainment section – but also due to the location that they are taught in; ranger 5 mentions this in quote 15.

> "Yeah I mean it's funny generally I think they more, it's not necessarily the activity, its more just being in the place they are in. I think they do get an awful lot from coming out here and maybe for them the activities are secondary." (Ranger 5 Quote 15)

Through the interviews the location of teaching – in this case the national park – has been shown to have an important affect on student attitudes. This is a prime reason to leave the classroom. If educators are serious about wanting to create responsible citizens then a good way to do it is to get the students out of the classrooms and into their communities. These interviews have shown this can be both inspirational and memorable. Field trips can also produce lasting change in an individual. Quote 13 from ranger 1 mentions that outdoor learning produced lasting change and this is supported by quote 16 from Ranger 5.

> "You know it's something as a teenager you go away and you do your own thing but it's when you get older and you start to think about the rest of the world rather than just you, I think then it [outdoor learning] makes a difference. I mean it might not make an immediate difference in the

next couple of years but once you get to think about it you might think: 'Oh I enjoyed that. Maybe I'll go again.'" (Ranger 5 Quote 16)

In the literature review the differences between informal and formal education were discussed. One of the downsides discovered regarding informal learning was that there needs to be a much greater emphasis placed on enjoyment and keeping the pupil engaged Kleis (1973), Ettlng (1993), Eshach (2006). In formal learning environments children are in a separate space from their personal lives, relatively free from distractions. However outdoors at Loch Lomond there are many diversions which means to bridge formal and informal learning effectively – a requirement of the new Curriculum for Excellence – it is important to make learning fun. The fact that the educators at the park are aware of this and have taken it into consideration when planning and producing their activities is good news for teachers wishing to visit the park and wanting to inject some enthusiasm into their chosen subject. Further, due to the long lasting affect that these positive experiences can bring giving the pupils positive attitudes towards subjects such as science and geography could translate into pupils pursuing learning in these subjects outside of the classroom, during their free time or even later into their adult lives.

4.1.3 Outdoor Physical Issues

The final major reason that interviewees stated for teachers leaving the classroom was the belief that is important to get young people out of the sealed school environment and into their local communities and surroundings to experience their subject area first hand and interact with local communities. The idea that school children these days are out of touch with their environment was found to be particularly strong amongst the rangers interviewed. As these rangers deal with hundreds of children from all over central Scotland it is important to understand their views on this area. Ranger number 6 provides an interesting insight into the current situation regarding getting children outdoors shown in quotes 17 and 18

> "There's some many kids from Glasgow who have never been outside their own council... the countryside to them is the local park with the swings. It's, it's quite scary!" (Ranger 5 Quote 17)

> "…I feel that the youth of today... and some young adults too have lost contact with their environment. Completely, not even a wee bit. We've got kids who don't play outside. I think we have completely lost touch with our environment. We live in such a manmade world, we work in a manmade world, we play in a manmade world, we travel in a manmade world; that means for me when the kids come out here I want them to reengage with their environment and that is my focus." (Ranger 5 Quote 18)

This ambition to get children into the outdoors and to experience the natural world is a strong driving force for the park staff. While this would be expected from a park ranger who's job it is to sell to the public the virtues of Scotland's national park it is important to look at in regards to comments from two of the teachers who booked trips to the park.

> "...and then I think they changed round the activities and then got them walking and got them out in the fresh air which is good as well!" (Teacher 1 Quote 19)

> "It was something I would walk up without any problem but taking kids up I hadn't really thought, you know a couple of the kids are going to struggle with this, and they did. It was hot and it was a bit sticky and so on and there was a few of them out of puff by the time we reached the top and you know you have got to rethink a few of these things. I think you know actually we've got kids who are couch potatoes." (Teacher 3 Quote 20)

These ideas that children are physically not as fit as they should be and that they are not spending enough time outdoors is a worrying discovery from the project. If children are not physically fit enough be taught geography up a hill then it is an added challenge to those who want to inspire children in the landscape that they are learning about. It is also interesting to note that while neither park staff nor the teachers

interviewed are involved in areas surrounding health education they were clearly of the opinion that pupils need more exercise and time outdoors than they were getting through the formal teaching curriculum. This idea that leaving the classroom and getting outdoors can be beneficial for your health is a reason that cropped up repeatedly during the interviews.

4.1.4 Healthy Minds Healthy Bodies

Leaving the classroom to increase a student's mental and physical wellbeing is a strong argument for the provision of school trips within the curriculum. From interviewing staff at Loch Lomond it was interesting to discover the volume of activities undertaken to meet the challenge of improving students well being. Physical activities such as nature walks, walking to areas to field sketch and getting out on loch to collect samples were all examples where students are more physically active than in their formal learning environment.

There is also the wider picture surrounding mental wellbeing which is interesting to look at. Due to the implementation of the new Curriculum for Excellence educators are now encouraged to create confident individuals and successful learners. How Loch Lomond and Trossachs national park addresses that is interesting to look at with quotes 21 and 22 providing some examples.

> "...they're going to do activities and they are going to go on the Sir Walter Scott paddle steamer and they're going to do activities with the rangers and the artists; go away somewhere for their holidays, come back in S1. They'll be the first classes to get the Curriculum for Excellence; so it's a transitional project, so they've mixed a wee bit with the other pupils from other schools and then they'll come back out in S1 and work with the artists and the rangers again and their inspiration for their outdoor learning visits will be used to create something based on the poem for a modern day society so well hold a celebration event about it." (Ranger 1 Quote 21)

> "I do a lot of taking groups and schools into the forest, it's one of my key things...Just you know showing them where their food comes from." (Ranger 4 Quote 22)

Both of these activities in different ways address the issues of increasing pupil wellbeing, issues which are now required for with the new curriculum. Quote 21 deals with mental issues surrounding the transition from primary to secondary school. Increasing and maintaining student confidence is crucial during this period so that the change in learning environment doesn't negatively affect educational attainment or the child's self confidence. It is interesting to note the way in which the national park is acting as a facilitator for dealing with this issue in a way which is more fun and exciting then would have been able in a school. Quote 22 however is a more traditional approach to improving wellbeing by getting younger pupils involved in some physical exercise and learning about healthy eating. According to the interviewees both activities work well and cater for different target audiences. By understanding what national educational policy is trying to do through the aims of the curriculum educators at the national park have managed to marry their facilities with the needs of visiting teachers. This bridging of formal educational goals with an informal setting allows both parties to benefit, through increasing visitor numbers for the park and children gaining a new exciting learning experience. It is also good to see that as the curriculum has changed the park has found new ways to meet the new outcomes. This is a very strong reason for teachers to take some time out the classroom and to organise educational trips to the park.

4.1.5 Schools Within The Park

A final point to note is that although this section primarily deals with reasons for school parties to leave the classroom and travel to the park there are in fact a number of small schools within the parks boundaries. For many in these schools leaving the classroom and travelling to sites within the park is for obvious reasons less of a problem. Transport times and costs are greatly reduced and many of the park attractions such as wildlife and forests can be seen in miniature within the school grounds. The park provides

additional support for these schools including rangers and facilitated activities with one ranger interviewed in particular dealing with these schools on regular basis.

As mentioned in the literature review it can often be challenging to divide education into sphere's of formal, informal and non-formal learning. Traditional ideas of exclusive formal in school learning and informal outdoor learning can fall down in many of the situations occurring in the park. A clear example of this is seen through the issues surrounding the parks work with local primary schools. Many of the outdoor learning (nominally informal) activities undertaken at the park by these schools are happening on school (nominally formal) grounds due to the fact that these rural schools possess many of the natural features utilized by park staff for outdoor learning, e.g. ponds, forests and nature trails. It would be an interesting study, and sadly beyond the scope of the project, to investigate how these more rural schools are coping with implementing the new Curriculum for Excellence, with its impetus on informal education, in comparison to urban city schools.

Due to their unique situation schools within the park boundaries seem to have already managed to bridge formal and informal learning to an extent not currently seen in schools outside the park. While there are still some general educational issues with organising park run educational activities for these schools it is interesting to note that in situations where the facilities of the park are on site or close to hand they are utilized more and consequently these schools receive more attention from park's educational staff. This leads support to findings from the literature review suggesting that the major reasons for not leaving the classroom such as transport costs and a lack of educational support are negatively affecting schools out with the park boundaries, who were found to spend less time participating in outdoor educational activities than schools within the park.

4.1.6 Reasons Why Teachers Leave The Classroom

To investigate the bridging of formal and informal education it is imperative to understand what drives teachers to leave the classroom. Through understanding why educators embark on these informal learning experiences it is possible to understand the benefits they believe the trips bring. Through interviewing educators involved in informal education in the park a picture has formed which elucidates the importance of providing children with an education that contains both formal and informal elements.

Reasons for leaving the classroom for a field trip to the park were given as their ability to show children first hand examples of what they are studying in school, that the field trip reinforces and ties in with school work, that field trips allow active learning, that excursions leave positive memories towards the subject area and change student attitudes, that field trips get pupils outdoors and into the local community, that it is good to get students hearing voices other than the teacher regarding the subject, that a field trip can encourage students to choose a subject in the curriculum and finally that the park was chosen as a location for the field trip as it was close by and had good facilities that accommodated all the aforementioned goals. While most of these ideas tied in with findings from the literature review it is interesting to note the new findings such as the belief amongst educators that if a prospective pupil knows a subject includes a field trip then it can encourage the pupil to choose the subject for further study.

The findings from the investigation have shown why educators organise a field trip. However due to the complex components of a field trip what is desired from an informal learning activity and what is achieved can often vary. To create a smooth transition between formal and informal learning environments it is important to look at what variables affect outdoor learning at Loch Lomond and how much they affect the desired educational goals of an excursion.

4.2 Variables Which Affect Learning?

From the interviews performed with educators involved in informal learning at Loch Lomond and Trossachs national park a variety of factors were found to influence the amount of learning that can happen on a field trip and thus the extent to which the activities on the field trip can benefit the curricular work performed by the students. During the interviews performed for this project the factors found which influence the extent of learning during a field trip were: the level of facilities available at the field trip location, class size, health and safety issues, the length of a field trip, whether the trip was part of larger classroom based project, the provision of a pre-visit orientation, weather issues, staff and student attitudes towards the trip and finally the affect that having a different educator can have on a student learning levels. To analyse these variables it is easiest to groups them into three smaller sections, park/logistical variables (facilities, location, class size and health and safety); time related issues (trip length, whether the trip was part of a larger project and orientation); and finally weather and attitude issues (both students and staff).

4.2.1 National Park and Logistical Variables

The park and logistical issues mentioned in the interviews were in regards to facilities, location, class size and health and safety. Of these issues class size and facilities were mentioned most frequently followed by location and then health and safety issues. In quote 23 ranger number 3 describes the current situation.

> "...the biggest thing that we have against us is weather and facilities. I mean the Go Ape Centre is not manageable by as anymore so we have to book. You don't really get too much going on at HQ because the conference rooms are always booked so unless we can use either a visitors centre or book the space outside we're pretty limited as to what we can do." (Ranger 3 Quote 23)

Due the variations in the climate of the west of Scotland it is important that visiting students have somewhere that is safe and dry when visiting the park as even the most dedicated teacher can have issues explaining a concept when they are struggling to be heard over the wind and rain. As a national park Loch Lomond and Trossachs has a variety of aims and requirements of which education is only one. Therefore educational resources can be tight resulting in the sharing of resources such as the head quarters being used for business conferences as well as school talks. A problem occurs when all of the park's indoor facilities are booked and a school party cannot work outside, as the weather is too bad. This situation can limit the number of facilitated ranger led field trips and also the activities the pupils can pursue. This may also be a major problem in regards to informal learning at the park as the provision of a visitor centre and ranger service were one of the reasons given by teacher 3 – shown in quote 24 – for choosing to come to the park.

> Interviewer: "So I suppose that's really, the reason why you chose it [the park] then as the location for your field trip?"
>
> Teacher 3 "It was the video resources that we had and the fact that that it's got a visitor centre so they can go in and look and they can pick up information on the area and also the visitor centre through the Internet was saying that it provided park rangers who could facilitate trips for us and input onto that." (Teacher 3 Quote 24)

The lack of indoor facilities for obvious reasons can greatly affect those wishing to organise an outdoor excursion in the west of Scotland. While the trip may be primarily focused on outdoor attractions if the weather turns bad it is important to have somewhere to go to continue the trip so that at least some of the educational points intended for later in the trip can still be covered.

The provision of facilities affects other variables which can influence learning. The availability of appropriate facilities influence the choice of location within the park for the excursion, how many pupils can come on the field trip and also health and safety issues. The national park covers 720 square miles of the Scottish countryside and as such covers a variety of different physical locations. This ability to provide

something for everyone is one of the park strengths however it also means that some areas are more educationally productive than others.

Luss is a small village on the banks of Loch Lomond and its ability to provide a variety of educational examples in a small area makes it a popular choice for school parties. During the interviews Luss was repeatedly referred to as a "honey pot site" by teachers and rangers and one which allowed students to investigate a variety of goals in one location. However the size of the village and the number of the school parties wishing to visit Luss creates logistical problems which in turn affect learning levels by limiting students' interactions with Luss' educational attractions. This issue of having too many educators wishing to teach in the one place at the one time can also be found in Balmaha and areas in the south of the park which are easiest to access from the large metropolitan areas around Glasgow. Ranger 1 in quote 25 describes the problem.

> "...if they're from the Glasgow area they're not likely to travel to Breadalbane or the Cowl to do their activity although we try to persuade them to take the pressure off, so they mostly go to Balmaha or Luss." (Ranger 1 Quote 25)

Ranger 6 also mentions the problem, shown in quote 26.

> "Purely from a getting there point of view those are the most popular locations which are Balmaha and Luss. I'm sure that schools would rather go to other places but the logistics of getting there as I explained earlier, its just not going to happen." (Ranger 6 Quote 26)

Loch Lomond and Trossachs national park contains numerous areas of educational interest including model villages, the highland boundary fault, Loch Sloy Hydroelectric plant and many sites of scientific interest. For the teachers interviewed a reason given for leaving the classroom was to experience the national parks first hand. However for this to happen it needs to be possible for the students to be physically able to get there. Due to poor transport infrastructure within the park and a need to adhere to a tight school timetable,

accessing all the areas of educational interest within the park was found to be not always possible. Finding ways to overcome these obstacles either through organising longer trips or improving transport access within the park would increase the levels of educational attainment possible when visiting the park.

The final issue from this subsection regards class size and health and safety. These areas are important to look at as the need for educators to adhere to their strict guidelines can influence the planning and carrying out of a field trip. The number of students present at the park on an individual field trip can vary wildly from small groups of around 15 to groups as large as an entire year of pupils. Ranger 1 in quote 27 describes the situation with large groups.

> "We can't cope with 120 young people coming out to visit us at the park in one day. Imagine the number of rangers that would require, that would be like all our ranger staff, so we've broken those up into visits into shorter and smaller groups, so I'll go out and give a pre-presentation about what they will be visiting the park to do, what the parks aims are you know the face of the park and then they would take a group out and visit with the ranger and you know that would work really well". (Ranger 1 Quote 27)

Even with these large groups broken down into smaller groups the situation in the park can still be challenging as highlighted in quote 28 by ranger 6.

> "A lot of what governs us and causes us to be so rigid in the way we do things is the sheer size of the groups. We talk to 33 - 34 kids, it's a lot to do and more often than not what we are doing is half the group with one ranger while the other half of the group is away with another and then we swap in the afternoon. That sometimes is very controlling and makes you have to stick to you know a rigid programme" (Ranger 6 Quote 28)

Through investigating the academic literature and speaking with the educators visiting the park it was found that having large numbers of students on a field trip could pose difficult problems. Quote 27 and 28

describe the logistical problems of accommodating large groups in terms of the manpower required and that class size also affects the type of activities that are possible to perform with the students. Active learning and hands on activities can be powerful learning tools but become a logistical nightmare if attempted in large numbers with few educators. Falk 1993 suggests that class size has a large impact on learning levels as it influences how closely an educator can work with a student during an activity and how many times the students can partake in an activity. A final point regarding the number of pupils on a field trip is that this can also influence health and safety issues due to students' need for supervision. From the interviews performed rangers 3 and 4 and teacher 3 all expressed concern with health and safety issues and in particular described a confusion with supervision guidelines as to the maximum number of pupils a ranger is allowed to work with at any one time.

4.2.2 Time Related Issues

Time related issues can vary the success of a field trip and were mentioned by 5 of the educators interviewed, with rangers 1 and 6 showing most concern. As previously mentioned, for schools within the park transport times to park sites are greatly shortened allowing more time at the field location. However, the vast majority of education visitors to the park are from out side the park's boundaries. Quote 29 from ranger 1 describes a typical day for visitors from the central belt.

> "If you're coming from quite far afield you wanna make the most of your visit, but then you've got the travel time linked into that so if you're getting a bus and you're from Glasgow then it's going to take you about an hour to get you out here. Maybe arriving around ten o'clock / half past ten; you've got to get off the bus do your toilet stop, then your ranger introduction, then activities might not start till half past ten or 11. Do an hour, have your lunch, do an hour, back on the bus travel back to school. So it might be a whole day for the young people but it might only be of pure activities only a couple of hours and they're broken up. So if it's something like a geography class

> then they'd maybe be taken to a couple of sites they'd maybe work with the rangers maybe the teachers could work with them on certain self led things." (Ranger 1 Quote 29)

Quote 29 explains a typical visit and also highlights some of the reasons for the continued popularity of locations such as Balmaha and Luss, which are the easiest for Glasgow pupils to get to. A clear factor which influences the amount a child can learn from an activity is the amount of time that the child can spend doing it. With the need for teachers to return students to the school in time for the end of the school day this can seriously affect the amount of time that a school party can spend in the park, this puts schools which are further from park at a distinct disadvantage. From speaking to the park rangers it was found that very few of the school parties visiting the park stay overnight and that the ones that do have to make their own arrangements as there are no park run facilities to accommodate pupils staying over. This shortage of activity time is an area of concern regarding bridging formal and informal education as teachers organising a field trip have to justify the need to take children away from an entire days learning in school for what may only turn out to be 2 hours teaching time. It is heartening to discover that park staff have taken this into account when planning activities and where possible they provide orientation to visiting school groups before the visit, ensuring less time is wasted upon arrival in the park. Quote 30 from ranger 5 describes this process.

> "I mean with Glasgow schools etc it's kind of easier probably for one ranger to go out and speak to 30 – 60 children rather than waste their time when they're out here being stuck in the building listening to people when they could be outside exploring the countryside and doing activities there. So from that, we can add on another hour of time there so it could be between four and five hours [of activities]." (Ranger 5 Quote 30)

Maximising the time available for learning makes it easier for teachers to justify the length of time it takes for schools to reach the park as well as helping make the visit more productive. However it is not only the park rangers who are taking this idea into account. 2 of the teachers interviewed incorporated the work

from the field trip into their classroom based study. Quote 31 from teacher 3 describes how their class used the information from their trip.

> "They answered as groups, they each had individual workbooks and taking those in and checking through them and they are pretty well filled in; and they perhaps back in the class, they work in groups of three or four and they would use the booklets of others within the group to make sure that they had filled in the slots and the bits and pieces. That particular one at Loch Lomond they wrote an individual report on the areas, that one was managed and one was unmanaged and the problems that were being faced." (Teacher 3 Quote 31)

From academic findings such as Lucas (2000) and Griffin (1998) it was found that using the field trip as part of a class based project or investigation can boost the educational impact of the visit and provide pupils with goal to gaining information on the day. In terms of time management this is also an effective way of organising your lessons so that the field trip incorporates aspects which are only possible at the field location and that time on the day is not wasted undertaking work which can be done in class.

4.2.3 Weather and Attitude Issues

It is a testament to the unpredictability of the climate at Loch Lomond that issues surrounding the weather were mentioned by 7 of the interviewees. As previously mentioned the weather at the park can affect the choice of location for a field trip due the requirements for somewhere to go if the conditions deteriorate. Due to a lack of availability of these indoor locations 2 of the teachers interviewed mentioned having to postpone field trips – in one case twice - to a later date; this can have a very strong influence on how educationally effective a field trip can be. Quote 32 from teacher 2 describes an example of the problems of bad weather leading to a shorter teaching time than desired.

> "...the only issue was timing...because it kept being put off because of bad weather etc. We ended up doing it in a day and it was a 2.45 finish so we were very rushed for time and you almost felt that the rangers were rushing through it and not giving it as much depth as there could be. Some points I did think oh it's a bit of a waste being here and not mentioning this or that and so timing, but then that's something that can't be helped. You're restricted by the school times and getting the pupils back for then." (Teacher 2 Quote 32)

Quote 32 highlights a problem with informal learning in that with so many composite factors a change in one element can have a knock-on detrimental effect on other aspects. In this case poor weather caused a shortening of the trip and consequently led to a perceived rushing through of what could have been useful learning examples. In the later years of secondary the school syllabuses can be so tight that if a trip gets cancelled due to dangerous weather conditions then there may not be time for it at another date. Detrimental weather can also have a negative affect on pupil enthusiasm as noted by ranger 2 in quote 33.

> "Yeah kids don't like rain. And if its practical its hard and I always you know, we try and prepare them, we always say bring wellies, bring rain coats you know and at the end of the day it's Scotland but you find if it does rain that children just lose all interest and that's that and trying to fulfil the same kind of criteria inside as you would do in the experiments or doing practical work outside is hard work and it takes a bit more effort so um the biggest thing that we have against us is weather and facilities." (Ranger 2 Quote 33)

Quote 33 exemplifies the problems of teaching outdoors in Scotland. A key reason noted by educators for leaving the classroom was to provide students with positive educational experiences that helped develop enthusiasm for the subject area. Children, like most people, do not enjoy being cold and wet and so the weather experienced by a field party on their trip can greatly alter the trip's level of success. Quote 33 also brings in the final variable noted by educators which affects how successful a trip is and that is the role of the participants' attitudes towards the excursion. The specifics of staff and visitor attitudes will be looked at

in more detail in the problems portion of this chapter but it is important to note that participant attitudes can greatly affect how successful a field trip is.

The relationship between the ranger leading a field trip and the teacher visiting can greatly vary the outcome of a field trip. Quote 34 and 35 highlight the most common complaints raised during the interviews.

> "I think as I said maybe with a few pupils adjusting to how they should behave in an outdoor situation and that would obviously vary depending on the school but certainly there were a couple of pupils that maybe weren't as willing to listen to the rangers as they would do a teacher." (Teacher 2 Quote 34)

> "We've tried to try and get the schools to run it themselves but they have a lot on their hands and it's much easier for them to say, you know can you come out for a couple of hours and they can go and have their coffee and I'll take the kids out." (Ranger 4 Quote 35)

To teach effectively it is important for an educator to have the respect of the class and the also the support of their fellow educators. In a situation like that which is mentioned in quote 34 it is vital that if the students are not willing to listen to the ranger then the teacher reasserts control and with the support of the ranger instils some appropriate discipline. The park staff at loch Lomond are not responsible for maintaining discipline and it is stated on the booking form that the responsibility lies with the individual teacher. It its therefore a worry that situations like the one mentioned in quote 35 exist where teachers are willing to shelve responsibility onto the ranger and use a field trip as an excuse to catch up on other work or simply just enjoy having a break.

The answer to this problem lies in the attitudes that teachers and rangers bring to a field trip. If a teacher treats a field trip as a "jolly" with little educational worth then the class will too and consequently it wastes the time of all concerned. While an informal learning event is a different learning experience it is not - if

performed correctly - less of a learning experience. It is therefore imperative to approach informal learning with the same professional attitude as formal learning. This will avoid the problems mentioned in quote 34 and lead to a successful learning event.

4.2.4 Models Of Variables That Affect Learning

Two models were looked at in the literature review which both attempted to categorise the variables which influenced the levels of educational attainment on a field trip. Orion and Hofstein's (1994) 'Three Factors Model' listed three over arching dimensions which influence student learning on a field trip: 'teaching factors', 'field trip factors' and 'student factors'. The factors found by Orion and Hofstein interact individually and collectively to influence levels of knowledge attainment.

Falk and Dierking's (2000) 'Contextual Model' was originally designed to understand museum learning, however its description of 11 separate factors which influence learning, as well and its categorization into three larger spheres of 'personal, socio-cultural, and physical' meant that it the model was useful for this project also. Falk and Dierking's (2000) proposed that if any of the spheres listed become neglected then meaningful learning becomes more difficult. From the interviews performed at Loch Lomond Falk and Dierking appear to be correct. Teachers neglecting their classes in favour of leaving learning up to the ranger cause the socio cultural sphere to become distorted as the productive group relationship which is required on a field trip becomes harder and in some cases impossible to attain. In further support of Falk and Dierking's ideas the issues encountered at Loch Lomond regarding trip location, weather and facilities can be viewed as a distortion within the physical sphere and consequential interruption of the student's environmental dialogue.

Falk and Storksdiec (2005) listed eleven different variables that they believed affected learning outcomes in informal learning:

> "1.Motivation and expectation. 2. Prior knowledge. 3. Prior experiences. 4. Prior interest. 5. Choice and control. 6 Within group social mediation. 7. Facilitated mediation by others. 8. Advanced organizers. 9. Orientation to the physical space. 10. Physical environment. 11. Design of exhibits (quality and exposure)". (Falk and Storksdiec 2005)

All of these variables to some extent can be found through the interviews performed for this project at Loch Lomond with the exception of last variable, which is museum specific.

Comments regarding the physical environment were especially common in the interviews, which is perhaps unsurprisingly for a project on a national park and in a culture where it is common to discuss the weather. Issues regarding timing of both transport and activities can be regarded in the context of advanced organisers and orientation to the physical space.

What these models suggest and what the research from this project has found is that knowledge attainment on a field trip is an incredibly complex process. Many competing factors influence the level of learning which happens on a field trip on both on an individual and a group level. However, to effectively bridge informal and formal learning it is imperative that educators recognise these variables and plan their field trip accordingly.

Maximising areas such as prior interest and knowledge experiences increase the likelihood that the visit will be a success and are achievable through effective pre-visit classroom activities. The areas around mediation, organisation and orientation can be addressed when planning and carrying out the field trip. The physical variables can - while not be changed in the case of the weather - at least be appropriately prepared for with back up activities if conditions deteriorate.

Having discovered and discussed what variables affect learning on a school trip it is important to look at how the field trips to Loch Lomond are structured, if they take these variables into account and if they are planned correspondingly.

4.3 How Are Field Trips to the National Park Structured?

The structure of a field trip can have a large influence on the success of an excursion and the ability of the trip to contribute to formal curricular learning. Interviewees were asked to describe the structure of their field trip or in the case of the park educators the structure of field trips they have organised. From these interviews a picture has formed as to what a field trip to Loch Lomond and Trossachs national park entails. Quote number 36 is from Teacher 1 and describes an example of a geography field trip to the park.

> "As I say the rangers came out and did a talk to them before hand and obviously we've been in class looking at national parks and then they were divided into groups and they went off doing different activities. Obviously we were limited to the time we had with the travel but then they did split them up into manageable groups of around 18 and then they looked at, as I said they did field sketching of the landscape, they did activities looking at sort of photo graphs and they also were spoken to about the sort of by-laws and the national park and the land use and conflict issues." (Teacher 1 Quote 36)

Some of the factors mentioned in quote 36 were also found whilst speaking to other educators in the park. Breaking the visiting party into smaller groups was a common practice and for geography parties visiting the park activities such as field sketching, discussing by-laws and conflict issues are commonplace.

The park caters for a large educational market with visitors consisting of primary pupils, secondary pupils of many different subjects, youth groups, families and tourists. For the purposes of this project it was the visiting school parties that were focused on, however even within this group there were some large differences as to the size, goals and activities undertaken by the groups.

Different age groups and curricular subjects often desire different outcomes from their trip to the national park. Consequently park rangers are trained to provide a variety of activities. Ranger number one highlights some of these in quote 37.

> "I guess it depends on the topic; for example with the 'Scott's Land' [a transitional p7/s1 project] one we are doing at the moment it's very structured because you've got a time table to stick to. You know you've got to get them on board a boat you've got to get them back on the bus so you have the time to fill. If it's you know maybe a primary school and they're say studying you know wildlife in Scotland or tourism in Scotland you'll find that primary schools are, they do topics that are on a project basis so they already cover cross curricular through that so you can use a topic to deliver lots of different things and that gives the rangers a bit of freedom to be creative with them." (Ranger 1 Quote 37)

Due to the decentralized nature of the park's educational structure a lot of freedom is given to the individual ranger to structure educational activities. This leads to much variety in the type of educational activities facilitated at Loch Lomond and the structure of the activities present.

He extent to which a field trip is structured depends on a variety of factors such class size, location, which ranger is working, the desired outcomes of the teacher, the age and behaviour of the class and the activities pursued on the day. For some activities such as those involving boats or other transport a more structured approach is necessitated due to the logistics of incorporating this mode of travel. For other activities such as nature walks and interviewing locals a much more flexible structure can be applied allowing for adaptations on the day to maximise learning opportunities.

Griffin & Symington's (1997) study found that there is tendency for some teachers to try to recreate the classroom environment whilst on a field trip leading to over structuring and a lessening of the ability of field trips to provide a perfect occasion for free choice or active learning. In order to maximise learning and avoid either an over structuring of the days learning or a trip that descends into chaos due to there being no

structure, academic researchers found that semi structured field trips work best (Griffin 1998, Falk & Dierking, 1992; Hooper-Greenhill, 1991; Price&Hein, 1991; Rennie & McClafferty, 1995; Storksdieck, 2006).

For this project it was important to investigate these ideas regarding appropriate structuring of field trips in the context of informal education at Loch Lomond and Trossachs national park. From the interviews it was found that the extent to which activities were structured depends a lot on the ranger, the age of the children and the logistics of the activity. Quotes 38 and 39 describe ranger 2 and 4's answers when asked how structured their activities were.

> "It tends to be if we are doing an activity they would come to do that activity, we wouldn't just go off on a tangent, they couldn't just go off on a tangent. No we tend not to. We wouldn't let them do that." (Ranger 2 Quote 38)

> "There's not that much structure to it [my activities] but certainly the schools will approach me quite regularly and ask me for either advice on doing something or to take them out" (Ranger 4 Quote 39)

Quote 40 comes from teacher 3 who was asked the same question.

> "Yeah I mean I tend to structure them quite a bit. I mean you can't leave things like that to chance really you've got to know what you want to do and what you'll be doing at various times" Teacher 3 Quote 40)

Rangers 2 and 4 and teacher 3 all participated in or facilitated different activities run by the park. With so many possible educational activities offered at Loch Lomond and so many groups catered for it is hard to form a general picture on how structured an average field trip to loch Lomond is and how structured it should be as in many cases the structure is completely trip specific. What is good news is that when

working with young children - where research suggests that it is important to only lightly structure activities - the park educators appear to following a lightly organised structured. It is when the groups get older, larger, more logistically complicated and are required to show specific "results" from their trip that they become more structured and consequently are less likely to engage in free-choice learning.

4.3.1 Structuring Issues: Educational Programmes

As mentioned previously the running of field activities at Loch Lomond is fairly decentralized with many of the rangers focusing on organising and facilitating areas they are personally interested in and feel are important. Therefore in some cases there is the potential for the educational programmes of the park and the desired programme of the visitors to diverge leading to the two parties involved in education to have competing aims for the school visit which would negatively affecting students learning. To understand how much this is the case at Loch Lomond it is important to look at the education programmes of the park and its visitors.

The specific issues surrounding the new Curriculum for Excellence will be looked at in more detail in its own individual section. In more general terms however it is still important to look at what points the national park are trying to convey. Quote 41 from ranger 1 sums up the current situation.

> "We don't have set programmes. We tend to have things we've traditionally done, because it's what we've been asked for. I think things will move away slightly because of the advent of the Curriculum for Excellence and what it wants and what the teachers should be asking for. Cross curricular and inter disciplinary learning should come through that, so we're very much in discussion when the booking forms are filled in. What are they currently studying, what will they be moving onto, what can we do to support those things so that when the young people come out we're not staring at a lot of blank faces introducing concepts that they haven't done; because that's just a waste of every bodies time and it can be quite demoralising for the rangers as well. So you

> want to compliment what they've been doing or what they will be doing or focusing on and I think the main what we're focusing on is moving away from what is traditionally seen as an end of year jolly and things becoming much more you know curriculum focused and what are the outcomes that need to be met and how can we help evidence that and achieve that." (Ranger 1 Quote 41)

The fact that park is aware of the introduction of the new curriculum and its requirements in areas such as cross-curricular and inter-disciplinary learning is good news in regards to the park being used as an informal learning location. An awareness in the planning process of the needs of the visitors helps prevent differences in educational focuses arising whist on the field trip and maxims the trips impact. This strategy also has an added bonus regarding attitudes towards learning because as mentioned in quote 41 both the rangers and visitors know what to expect.

It was also noted through interviews for this project that although there are 2 national parks in Scotland – Loch Lomond and Trossachs national park and the Cairngorms national park - there is no joint education strategy between the two. This was found to be due to a difference in organisational styles and a difference in priorities.

In general terms it is the schools visiting Loch Lomond and Trossachs national park that tell the park staff their educational goals and the park acts as a facilitator to makes them happen. While this is good for the visiting schools as they can tailor their trip according to their needs it puts a lot of strain on the park rangers who are expected to change their talks and activities on a daily basis. This has led some rangers to wish for the construction a group of set programmes for park visitors designed around several specific topics. From speaking to members of park staff this process appears to be underway. However, while the teaching of standardised programmes saves time and energy for the park staff, educators must be careful that the new programmes do not leave out important aspects that are required by visiting teachers and the new curriculum. A second potential problem with standardised programmes is that historically one of the strengths of the national park is that the rangers' individual passions and experiences in certain subject areas allow them to enthusiastically convey issues they think are important. If the new programmes which

are to be designed by the park only focus and explain the park's traditional strengths – e.g. areas the rangers are personally interested in – then future teachers focussing on new areas which are important to the syllabus but perhaps less so to the rangers individually may struggle to get their point across during their field trip. This could consequently make the bridging of informal and formal education much harder at the park.

4.3.2 Planning the Structure of a Field Trip

As previously mentioned the planning of the structure of the field trip originates through a dialogue between the visiting teacher and a member of the parks educational staff. The process is highlighted in quote 42 from ranger 1

> "Yeah I mean the booking form has a wee space for topics covered in class recently and when they start to put down the sites that they are visiting and the topics that they working on you know things start to click and you sort of know what they're looking for. And again if they've come out before then you know exactly and you know email systems these days its just you know send an email to the school, the teacher they can bounce stuff back discuss with the ranger, the booking forms completed and then we have records of what the people have asked for in the past and then yeah it all kind of, all that information helps in the planning process." (Ranger 1 Quote 42)

In term of bridging formal and informal education creating a pre-trip planning dialogue is a very effective method of making sure the visitors are getting exactly what they want from a trip. It is also effective in allowing the rangers advanced warning of what is expected on the trip so that they can maximise planning time and arrange the desired activities.

4.3.3 Worksheets

In the final part of the section dealing with structuring a field trip it is important to look at the uses and practicalities of using worksheets whilst on a field trip due to their common occurrence in informal learning.

Depending on the situation, using worksheets during a field trip can be either beneficial or a hindrance. Research has suggested that a major benefit of worksheets are that they can bring some needed structure to a field trip by focussing the students attention on certain aspects of the trip particular if visiting an area with many distractions. Researchers found favouring the use of worksheets include Griffin 1994, Kisiel 2003, Mony & Heimlich 2008 and DeWitt & Storksdieck 2008. Griffin (1994) and Kisiel (2003) listed some additional benefits of worksheets such as the fact teachers are used to using them and that they are relatively easy for the trip location to provide. However, other researchers such as Kisiel, (2003) & (2006), McManus, (1985) and Price & Hein, (1991) found that worksheets on field trips can be detrimental to the learning experience as they are too often used to control pupil behaviour, contain overly detailed questions that do not allow pupils to interact with the informal learning event and essentially act as an instrument to impose formal learning practices in informal environments.

With worksheets having both positive and negative affects on learning part of this project was to investigate the opinions of the educators involved in informal education at Loch Lomond regarding worksheets. It was important to discover whether worksheets were commonly used on field trips to the park and if so were they used appropriately. All the educators interviewed were asked for their thoughts regarding worksheets and some interesting points were found.

Positive aspects of using worksheets whilst at Loch Lomond were found to be: their ability to capture information for use back in classroom, the fact that worksheets can introduce new ideas during the trip that pupils left to their own devices may not have thought of, that they "provide evidence of learning" (quote 43 Ranger 1), that worksheets act as good reference points and aid memoirs, they promote group work and

working in pairs and finally that they can help groups focus in and concentrate on certain aspects of the trip.

Negative aspects noted by educators regarding worksheets consisted of their impracticality in a location where frequent rainfall turns them to mush, that the educator doesn't want to "swamp them with clip boards and pencils" (quote 44 Ranger 1) and that the focus for some particularly young students is on having fun and worksheets make the day less enjoyable. Ranger 3 provided quote 45 which sums up another problem with worksheets.

> "...you wish that they'd listen and not be just listening out for buzzwords because they'll just stop listening straight away and start scrawling and then you are like, 'wow'. You've lost your train of thought now so you're not always able to pick it up again." (Ranger 3 Quote 45)

In addition to their interruptive element other problems mentioned with work sheets were that they could act as a barrier to learning as children spend time writing about the animal rather than touching, listening and experiencing it. Finally it was noted that worksheets can cause an over structuring of the day which limits both creativity and the required educational flexibility which is so important in informal education.

In synopsis many of the problems noted by academic research regarding worksheets were found through the interviews undertaken at the park. New issues such as weather and the fact worksheets can be off putting for teachers were mentioned. These were points which were not found through the literature review. The ability of work sheets to encourage team work was also an issue which was not found in the literature reviewed, however it is important for this project in regards to new Scottish curriculum with its desire for pupils to have increased communication and groups working skills.

During the literature reviewed it was noted that due to the fact that there are many positive and negative points regarding worksheets many teachers have conflicting feelings regarding there use. From speaking to the educators at Loch Lomond I believe that the use of worksheets needs to be considered in relation to the

variables that affect a field trip. The age of the students on the trip, the excursions educational goals, the amount of time available for the trip and the weather conditions present all affect the practicalities of using a worksheet. It is important to note the majority of interviewees were neither strongly for nor strongly against the use of worksheets and were aware of both the strengths and weaknesses of worksheets. Quote 46 from ranger 5 exemplifies attitudes towards worksheets.

"...if you were looking at it purely from the point of view of here's the worksheet now go away and do it and or get back on your bus. That's not how I would envisage it working. It's an integral part of the process, so they are doing an activity and the worksheet is maybe just recording the thing - their outcomes really so they've got something to work on later." (Ranger 5 Quote 46)

In regards to the bridging of formal and informal learning quote 46 and the findings from the interviews suggest that educators are aware of many of the issues surrounding worksheets and field trips and know when to use them appropriately. This is good news for those wishing to organise field trips to Loch Lomond and Trossachs national park as it suggests that when worksheets are used they are only used appropriately.

Informal education is an area that has received much less attention from academic research than formal education. This is for a variety of reasons such as informal learning's complex nature and the traditional idea that important learning happens only in classrooms. However due to informal learning's ability to cater to many aims and its ability to provide learning experiences impossible in classroom I believe it has a vital role to play in the education of young people today. The aims of the educators participating in informal learning were looked at earlier in this section along with the variables that affect the attainment of these aims. Finally this section addressed how to structure a field trip to best deal with these variables.

A pre-visit dialogue between parties involved in a trip helps make sure that both parties involved in a field trip are aiming to teach the students the same information. An understanding of when it is appropriate to use a worksheet maximises the impact of these common educational tools and finally an awareness of the

different needs of differing educational groups helps educators provide the best structure for their target audience.

With all these points considered the next aspect to investigate regarding field trips is that once an excursion is planned and is structured to deal with the various factors that can negatively affect a field trip then how do you maximise knowledge attainment on the field trip. How do you get the most mileage from your visit and ensure that your field trip benefits your formal curricular work?

4.4 Knowledge Attainment

From the literature review and the interviews performed at Loch Lomond and Trossachs national park three major areas were discovered which can greatly influence the levels of educational attainment possible on a field trip. Whether classes have performed pre and post visit activities affects how much children learn and retain information from their field trip. Academic research has shown that successful field trips incorporate a pre and post visit element to their excursions; consequently it was important for the project to discover how prevalent this was for trips to the national park.

Another important feature which influences knowledge attainment whist on a field trip is the familiarity of the students with the activities and location of the informal learning events. This 'novelty factor' and the actions taken by educators to prevent it from detracting from the educational goals of a trip are important to understand both in relation to the national park and the wider context.

4.4.1 Pre-Visit Activities

In the literature review it was noted that many educational researchers highlight the importance of pre and post visit activities (Orion and Hofstein 1994; Healey et al 2001; Dillon et al 2006; Griffin and Symington 1997; Falk et al 1978; Finson and Enochs 1987; Anderson et al 2000; Falk Dierking 1992; Gennaro 1981; Ramey-Gassert et al 1994; Koran, Koran & Ellis 1989; Lonergan 1988; Anderson et al 1997 and Ballantyne and Packer 2002). From the literature it was found that effective pre-visit activities - suggested as the use of prior instructions such as films, slides, lectures, outlines and supplemental reading (Koran, Koran & Ellis 1989) and also a thorough briefing and debriefing of the student participants (Lonergan 1988) - greatly enhanced the educational effectiveness of a field trip. It was also found that if teachers were pushed for time before a trip then students of an average to poor performing education ability will benefit more from pre-visit activities than higher achieving students (Delany 1967).

One way to evaluate the success of informal learning at the national park was to investigate the provision of pre-visit activities. From the educators interviewed for the project, all three teachers who carried out excursions to the park had performed pre-visit activities. The most common activities found were the provision of pre-visit talks performed by the teachers. In regards to directing pre-visit talks at certain areas of the class, 2 of the classes which visited the park were already streamed and as such all the children were of roughly the same ability. In these classes all students received the same pre-visit activities. Teacher number 3 had a mixed ability class and when asked about pre-visit activities responded as shown in quote 47.

> "They probably had the same input but I think the thing is getting out in the field gives you a chance to focus in on some of the kids who may not be as motivated as they see it for the first time and it gives you the chance to, particularly if you've got a ranger leading the group, you can go and work with some of the kids who might be struggling a bit more or you can make comments to the good kids to push them a little bit further." (Teacher 3 Quote 47)

Quote 47 is interesting in that it highlights the idea that specialising on certain areas of the class beforehand is less important as long as during the trip you can direct your teaching at the specific pupils who are struggling. Whilst according to teacher 3 this worked very well on their field trip it should be noted that in other situations it may not be as effective, due to its reliance on the provision of a ranger and in particular a ranger who is capable of controlling the entire group while the teacher leaves to focus on individual pupils. Further the ideas in quote 47 require a teacher who is capable of noticing which pupils are struggling in their new learning environment and when this is happening.

The park staff interviewed for the project had positive views regarding the implementation of pre visit activities. An example is quote 48 from ranger 5.

> "I mean with Glasgow schools etc it's kind of easier probably for one ranger to go out and speak to 30 – 60 children rather than waste their time when they're out here being stuck in the building listening to people when they could be outside exploring the countryside and doing activities there." (Ranger 5. Quote 48)

While quote 48 shows that park staff are relatively happy to perform pre-visit talks, it does depend on the schools location. Many visiting schools are too far for the staff members to travel to due to a lack of available time and resources. If pupils arrive at the park without having had a ranger led pre-visit talk this can result in valuable time on the day of the field trip being taken up with orientation and an explanations of rules and appropriate behaviour. This issue is a particular problem for schools from far away from the park who due to travel times and the school timetable have less time on site than closer schools and due to their location are too far for the Rangers to visit before the trip.

An effective field trips should if possible contain a pre-visit activity to help explain the events of the field trip and lessen any problems the students have in adjusting to an informal learning environment. As mentioned schools which are far away from the park may suffer the double problem of a lack of ranger lead pre-visit activity and also have less time on the day for learning activities due to the need to perform orientation activities onsite and also still return in time for the school day. Thankfully during the interviews it was discovered that park staff are aware of these problems and are taking steps to deal with them, this is shown in quote 49 by Ranger 5.

> "…we've suggested it to a couple of schools, is to do it via a video link or a video conference. We've no idea whether it will work but we can try, we can but try. Another idea has been to film it but that has to, you know that would be a bit mundane. You know watching a video of someone who's not really there is a bit boring but the actual video conferencing has yet to be tried." (Ranger 5 Quote 49)

Quote 49 is interesting in that it highlights the fact that staff members within the park are aware of the importance of a pre-visit activity and also that they are willing to embrace new technological advances in order to solve the problem of reaching far away schools. The quote also suggests that the ranger interviewed is aware of what makes a good pre-visit activity, with its need to be engaging and speak directly to the pupils. By embracing and designing pre-visit activities that engage the visiting pupils with a taste of what is to come on their visit it increases enthusiasm for the proposed trip, saves valuable orientation time on the day and introduces the informal style of learning practiced at the park. This is important in regards to the project as it shows that park staff are already - to an extent - bridging informal and formal education.

4.4.2 Post Visit Activities

Academic research performed by Orion and Hofstein, (1994); Anderson, Lucas, Ginns & Dierking (2000); Farmer & Wott, (1995); Finson & Enochs, (1987); Gennaro, (1981); Lucas (2000) stressed that an important component in bridging formal and informal education is the provision of post visit activities once the group has returned to the formal learning environment. Incorporating post visit activities was also found by Uzzell et al. (1995) and Lucas (2000) who discovered it help clearly link the outdoor learning of physical world with the indoor world of formal education. Griffin 1998 also found that incorporating field trips into a larger class based project helped clarify the purpose of the visit to the students as well as give the students a goal of learning concepts that'll be required back at school. However none of the aforementioned research was performed in Scotland and so for this project it was interesting to discover their ideas in the context of bridging informal learning at Loch Lomond and Trossachs national park.

From interviewing the teachers who had organised field trips to Loch Lomond it was found that one class performed reflective presentations on their visit once they were back at school, one class took photos and videos of their trips - although the trip itself was described as an addition to their classroom work and not part of larger investigation - and the final class were visiting the park as part of a four day programme of

taking the students out into the field. Academic research suggests the importance of post visit activities in making both the fieldwork relevant to classroom based activities and also in linking classroom based work to the world outside of the schoolroom. Therefore it is good news for this project to find that the teachers interviewed during the investigation were each performing post visit activities.

None of the park staff interviewed for the project were involved in post-visit activities with the students from the visiting schools. All rangers noted that they had post visit interactions with the teachers who had led a field party - as they often returned with different classes. The rangers however only usually meet the school parties once. The reasons for this were given as a lack of time to visit the schools and also that none of the teachers visiting the park had requested this. Exceptions to this were found in regards to projects working with local schools within the park where repeat cooperation is more common and the rangers are more likely to see the pupils in a social setting as well as an educational one.

Overall in regards to the data collected for this project the issues surrounding post visit activities appear to be quite positive. While the numbers of educators interviewed were relatively small due to time constraints it is important to note that they do highlight that the linking of outdoor activities into the formal educational environment is taking place. According to academic research this will increase knowledge attainment from the field trip (Griffin 1998). It also links the students overall education to their outside environment in a way that is needed in the Scottish formal education system.

4.4.3 The Novelty Factor

Looking at the role of post and pre-visit activities in this project revealed their importance in increasing the student's knowledge attainment whilst on a field trip. By incorporating field trips into classroom projects it is easier to link the formal and informal spheres of learning. Pre-visit activities help familiarise pupils with the aims of the trip and what should be expected. Post visit activities help ensure that the educational

concepts from a trip are retained and related to class based teaching. Both of these were found to be present from the interviews performed at the national park.

Post and pre visit activities play an important role in another aspect of informal learning, namely the novelty factor. Researchers such as Hofstein & Rosenfeld (1996) and Kubota & Olstad (1991) found that the novelty of an educational learning experience can have an effect on students learning experiences and consequently their cognitive learning outcomes. Within Activity Theory there are also ideas proposed by Il'enkov (1977, 1982) and Gutierrez et al., (1995, 1999) that the introduction of new learning environments causes an internal contradiction of learning within the students which is a driving force of cognitive change. It was important for this project to investigate these academic and theoretical ideas within the context of the outdoor education performed at Loch Lomond.

All of the educators interviewed for the project were unaware of the term 'novelty factor' in regards to field trip education. However after the term was explained all the interviewees had some experience of its ideas and were aware of the concept, although not the terminology. Negative issues found during the interviews around the introduction of students to a new learning environment were found to be: behavioural issues regarding how the pupils should act in the new environment, student's not listening to the ranger as they would a teacher in school, the wearing of inappropriate clothing and lack of awareness surrounding outdoor weather conditions and finally that student's felt out of their comfort zones. As previously mentioned appropriate pre-visit activities can lessen these negative effects regarding the transition between learning environments and thus make a field trip less problematic. As well as pre-visit talks and orientation the park also provides information on its website of what to expect when visiting the park. This is designed to deal with these negative issues related to the novelty factor.

Activity theorists argue that student transitions to a new learning environment can bring benefits as well as problems. While there were some problems found through the interviews regarding the novelty factor it was interesting to note that none of the interviewees thought this was a particularly large issue and that two interviewees felt that challenging the pupils through a transition in learning environments was a very good

thing. Positive issues regarding the novelty factor were found to be: its ability to increase social skills like leadership and team building, that it provides the students with more educational freedom and that it allows students who previously weren't performing well in the classroom environment the chance to learn in a different way. Quote 50 from Ranger 1 sums up a common position found amongst interviewees regarding the novelty effect.

> "…but then it's a good thing as well, because outdoor learning is out the classroom it maybe reduces the barriers that the classroom context can have. Hopefully there's a bit of freedom and hopefully once they get into that mindset maybe they'll start to excel where as maybe they wouldn't have excelled before. It's [the novelty factor] not something I'm overly worried about and it might be a good thing." (Ranger 1 quote 50)

Overall the views of those interviewed for the project correlate with the academic findings reading the novelty affect by highlighting both the positive and the negative aspects of teaching students in different learning environment. In regards to the theoretical ideas proposed by Il'enkov (1977, 1982) and Gutierrez et al., (1995, 1999) that the interaction of learning environments can lead to important cognitive changes it is interesting to look at quote 51 from ranger 6.

> "I see it all the time. I see kids that are A1 stars in the classroom and they walk in here and they are like a fish out of water and there's wee Johnny who's never passed an exam in his life and suddenly is the star pupil of that day because he does go outside, he does climb trees, he does know that that's a blackbird. Suddenly he's buzzing and the teacher will say to me at the end of the day "My god just exactly what happened there. That child has sat in my class and not uttered a word and yet I bring him out here today and it's like a different person". So what works well for some like in the classroom…doesn't work well for others. And if wee Johnny can come out here and maybe have one good day and change his teachers view point on him then what's wrong with that?" (Ranger 6. Quote 51)

Quote 51 neatly summaries the issues regarding the novelty factor and the use of pre and post visit activities to combat it. The quote exemplifies the idea from activity theory that for some people changing learning environments can have a profound positive cognitive and behavioural effect.

Quote 51 also brings in larger issues relating to the need for field trips. Ranger 6 highlights the fact that currently in the formal education system there are children who are sidelined from formal teaching practices. There is a real need to allow students who don't thrive in the classroom-learning environment to have a day when they can show the teacher and the rest of the class just what they are capable of and our research has found that a field trip is a good way to achieve this.

In order to maximise knowledge attainment on a field trip it is important to understand the variables that influence a field trip, to structure a field trip to minimise the variables that negatively affect learning and maximise those that enhance learning. It is also important to understand the novelty factor and that introducing students to a different learning environment can have both negative and positive effects.

Appropriate pre-visit and post visit activities help lessen the shock of a new environment and provide a platform to introduce concepts that bridge both the formal and informal learning environments. If educators are to seriously harness the riches of Scotland's informal learning sites into the formal educational system then these are practical actions that can make this happen. If educators act on this, providing field trips with pre and post visit activities, then it will lead to a benefit for not just wee Johnny but all the Scottish children who are currently marginalised by the formal education system and who are unable to relate all their outside learning to their formal education.

4.5 Scotland's New Curriculum

In 2009 and 2010 the Scottish Government rolled out the new formal curriculum to all state run primary and secondary schools. The 'Curriculum for Excellence' replaced the old national 5 -14 syllabus and brought new ideas into the formal education of Scotland's young people. There has been much controversy over the implementation of the new Curriculum for Excellence within Scotland's schools and the level of support provided to help educators deal with the transition. It is beyond the scope of the project to assess the strengths and weaknesses of the new curriculum in relation to the older syllabus. However it is important to note that this projected was carried out while the formal education system of Scotland was in a state of flux with some schools visiting the park having moved over to the new system while others were still operating from the older 5 -14 syllabus.

The implementation of a new formal curriculum has large implications on those informal learning locations such as Loch Lomond and Trossachs national park which have a history of providing curricular support to visiting educators. This has a consequential affect on this project as the changes in the formal education system have led to changes regarding informal education and how educators bridge the two when one system is changing.

4.5.1 The Curriculum for Excellence

While some educators interviewed during the project were still using the older 5 -14 syllabus it is important for the project to focus on the ideas of the new 'Curriculum for Excellence' as despite its teething pains it still remains the blueprint for future formal education in Scotland. The 'Curriculum for Excellence' is described by the Scottish Government as aiming to ensure that "all children and young people in Scotland develop the attributes, knowledge and skills they will need to flourish in life, learning and work" (Learning Teaching Scotland Website). The government intends that the knowledge, skills and attitudes the young

people will develop will allow them to demonstrate four key capacities: to be successful learners, confident individuals, successful learners, responsible citizens and effective contributors. A diagram produced by the Scottish government explaining the terminology of these capacities is found in diagram 1.

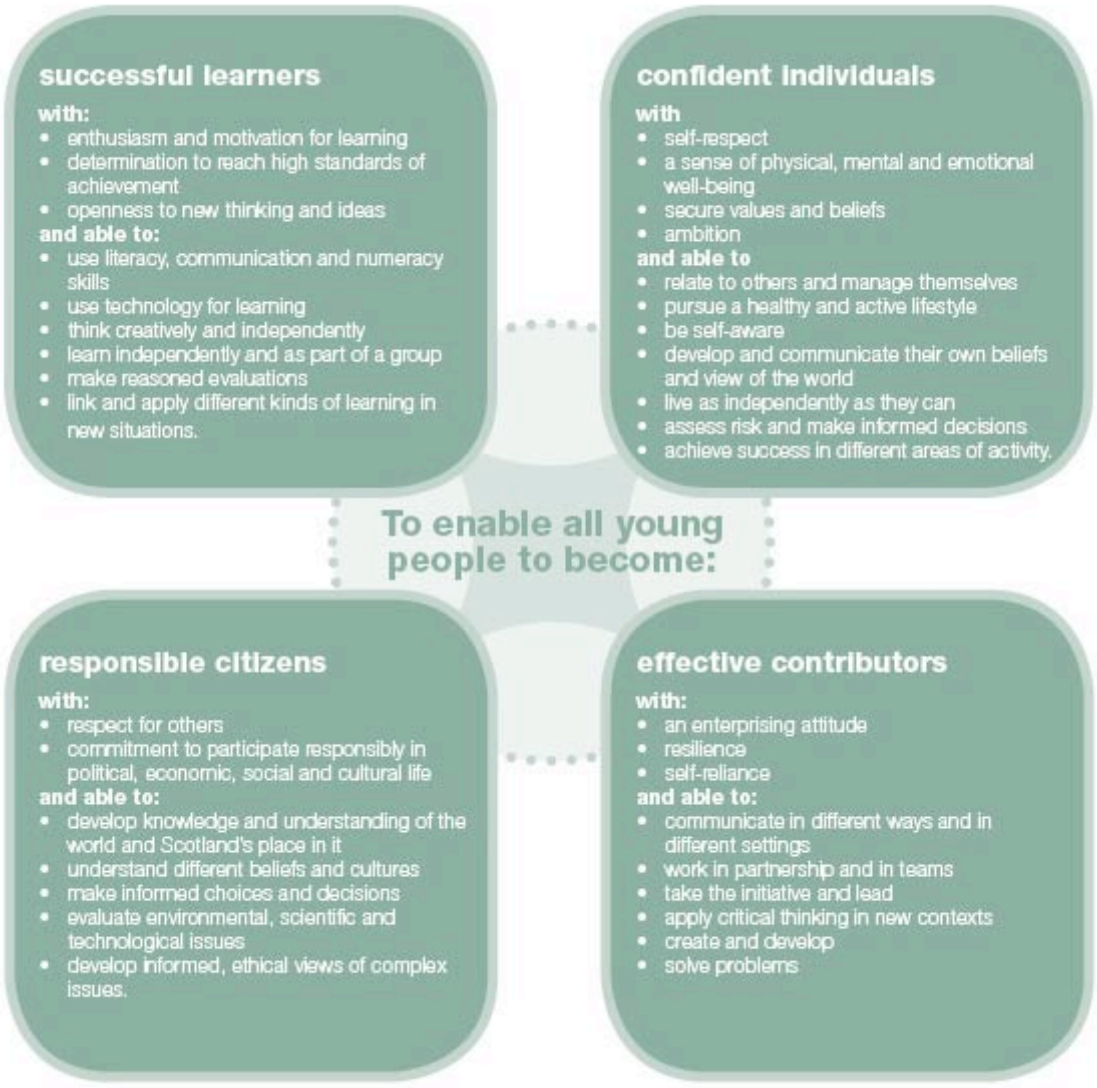

Diagram 1 Scottish Government's four key educational capacities. (Learning and Teaching Scotland Website)

An effective way to achieve the project's aim of understanding the bridging of formal and informal education is to use the government's definitions of the four capabilities as a description of the aims of

formal learning. By comparing and contrasting these aims with the information produced from the interviews performed at the park regarding the aims and practices of informal education it is possible to understand to what extend the two areas of learning are united.

To address the question of, 'How does the informal learning facilitated at the park connect with the new Curriculum for Excellence?' this chapter will focus on the relation between the four capabilities and informal education at the park. It will look at the ideas around cross-curricular learning and outdoor learning and finally any general issues relating to the relationship between the new Curriculum for Excellence and the informal education performed at Loch Lomond and Trossachs national park.

4.5.2 Integrating the Four Capabilities into Informal Education: Successful Learners

All 9 of the interviewees for the project mentioned aspects of informal education that tie into the four capabilities desired by the Curriculum for Excellence. In regards to the aims of the Successful Learners aspect of the new curriculum many of the activities performed whilst on a field trip achieve the aims of developing enthusiasm and motivation for learning. By being outside and participating in fun learning activities the educators visiting Loch Lomond and Trossachs national park are harnessing the enthusiasm children naturally produce outdoors into a constructive educational direction. An example of this is found in quote 52 from ranger 1.

> "If its p1's they're coming to out to learn about, I don't know Autumn changes or something, you still want them to have fun but you want them to have connected with the natural environment" (Ranger 1. Quote 52)

By involving fun active learning techniques to increase educational enthusiasm in a way that is impossible in a classroom, quote 52 highlights the way that informal education at the park is contributing to formal

educational goals. As previously mentioned a reason given by teachers for organising a field trip is its ability to allow students to hear educational ideas from voices other than their teacher. Through activities such as Ranger talks, interviewing tourists and having question and answer sessions with local farmers, students visiting the park whilst on a field trip are opening up to new ideas and thinking and are also having to use their literacy and communication skills to participate in these activities.

Examples meeting the requirements in the Curriculum for Excellence for independent and group learning were found through the educational activities listed by the interviewees, with group projects and individual worksheets answering these curricular requirements. The requirement of students to use technology in order to become successful learners is an area which would appear at first to pose a problem in a national park renowned for its 'natural' experiences. However it was found through the projects interviews that measures are being taken within the parks educational structure to encourage the use of technology during activities. An example of this is found during the interviews is the development of a project between schools within the park and the national park rangers which tracks the signs or Autumn and Spring throughout the park and encourages pupils to take photos of the signs of the changing seasons – for instance leaves falling or birds migrating. Pupils then upload the photos on the Internet to form an interactive map which shows the speed and spread of the seasonal changes.

The findings of the interviews show that there is an awareness within the national park of the need to evolve in order to meet changing curricular requirements. This is good news. What is also heartening is the evidence found by this project of the ability of an informal learning location to branch out into new learning activities. Findings from this project suggest that there can be a flexibility in informal learning environments which allow them to not only show their attractions in the way they have traditionally but also change to evolve new educational activities in order to better connect to the changing desires of a formal curriculum.

4.5.3 Confident Individuals

In diagram 1 there are listed the curricular requirements of the second capability, entitled confident individuals. The first criteria of the 'confident individuals' capability deals with the need to teach Scottish students about the importance of self-respect and to instil within the student a sense of physical, mental and emotional wellbeing. While the educational activities performed at the national park are primarily designed to convey educational concepts and teach practical skills the social aims of the curriculum were not forgotten. Quote 53 from Ranger 1 provides an example of the consideration informal educators at the park put into achieving formal curricular goals.

> "How do we meet responsibility for all subjects like health and well being? Well by just being out in the park is your emotional wellbeing. Your physical well being - taking part in activities outside of the classroom will increase that. So that's meeting those outcomes. Maybe we need to incorporate more...Well the discussion and the debate that can form around the discussions that are being covered [in the park] can lead to literacy [skills], it doesn't have to be physically reading a book in the countryside to meet literacy outcomes, and I think that that's what people start to think of but the more you look into it, it can be a bit more abstract." (Ranger 1. Quote 53)

Quote 53 highlights the depth of consideration that park educational staff have given towards the new curricular requirements. In regards to the criteria of confident individuals many of the activities performed at the park meet these requirements through the parks location. Getting children moving around outdoors benefits students' mental and physical and emotional health. Interacting with tourists, rangers, farmers and other students can help students to become self aware, to relate better to other people and to develop their communication skills in real world environment. Quote 53 also highlights the consideration given by the park to addressing areas of the curriculum which might seem traditionally unlikely to happen outdoors. Ranger 1's desire that literacy skills should also happen whilst on a field trip opens up the idea of outdoor learning to subjects like English and History which perhaps traditionally would have over looked a national park.

The desire of educators pursuing outdoor activities at Loch Lomond and Trossachs national park to achieve multiple aims from their field trip has led to innovative ways to teach curricular subjects. This innovation on the part of informal learning locations to accommodate all possible formal subjects is an area which is often over looked by educational researchers. By leaving the utilization of our national parks up to traditional subjects like geography many teachers are missing the chance to teach in an innovative manner which could reach out to students who are put off by traditional methods of teaching subjects such as English and the arts.

4.5.4 Responsible Citizens

The criteria of the 'Responsible Citizens' capability designated by the Scottish government emphasises many ideas which were found to be present at Loch Lomond and Trossachs national park. The priority given by the new curriculum to teaching students about respect for others and their need to act responsibly fits in with the educational priorities of the national park. Quote 54 from Ranger 1 provides an example of this,

> "Yeah I think overall, overarching everything, we try and promote a care and respect for the park and the natural environment of Scotland as a whole but focussing on the park because we are in the park. We want to engender that sense of sustainability that they can take back when they come back for a visit with their family …. so everything is done with an overview of the national park ... so that they just develop that sense of respect so that when they're visiting when they are adolescents, when they are older, that they'll have that sense of you know, behaving responsibly, of caring for the environment, that kind of thing. So everything really that we do is that education for sustainability issue/ ethos and there's threads of that throughout. (Ranger 1 quote 54)

Quote 54 highlights the fact that the park was originally designed to safeguard an area of outstanding natural beauty. Consequently it has always been in the parks interest to teach visitors about how to act responsibly in the countryside. The convergence of the new curriculum's goals with the parks original aims has – perhaps unintentionally –formed a bridge between one of Scotland's most popular tourist sites and Scotland's formal education system.

While the project has discovered that both the park and the new curriculum are aiming to teach students about respect it was important to look at the views of the teachers visiting the park to discover if they were aware of this educational priority and had any experience in its implementation.

All three teachers interviewed mentioned that they had participated in activities which dealt in areas surrounding 'respect'. Teacher 1 described looking with the students at local by-laws and the need for regulation to protect natural areas, teacher 2 focussed on vandalism and conflicting uses of the park and teacher 3 looked at issues surrounding littering and the differences between managed and unmanaged areas. All of these suggest that the messages of respect and responsibility are being conveyed through informal educational activities within the park and that formal educational goals are being achieved in informal settings.

The 'Responsible Citizens' capability of the Curriculum for Excellence stimulates educators to visit informal learning sites in order to meet formal learning requirements. The emphasis on teaching students how to participate responsibly in Scotland's political, economic, social and cultural life encourages educators to find ways to show students what Scottish society consists of. By acting as a location where the students can sample aspects of Scottish society that they are unable to access within the classroom the national park can play an important role in meeting curricular desires. Using issues such as vandalism in the park means that Loch Lomond and Trossachs national park can act as an exemplar of wider issues whilst still getting across site specific messages and achieving their own goals of widening interest and usage of the park. This benefits both parties and is a clear indication of how informal and formal learning environments working together can have a greater effect than either party working individually.

4.5.5 Effective Contributors

The final capability listed by the Curriculum for Excellence – see diagram 1 – is the idea of 'Effective Contributors'. While previously in this section we've looked at the ability of informal education sites such as Loch Lomond to facilitate the new educational emphasis on areas such as pupil confidence, respect and involving pupils in their local environments the final capability is perhaps the easiest to bridge with informal education. The curricular idea of 'effective contributors' – diagram 1 - requires students to develop "an enterprising attitude, resilience and self-reliance". It furthers requires that educators teach students to be able to "communicate in different ways and different settings, to work in partnerships and in team, to take the initiative and lead, to apply critical thinking in new contexts, to create and develop and finally to solve problems." In order to understand how easily informal education could meet these curricular goals it was important for this project to interview educators using the park.

As previously mentioned all three teachers interviewed stated that there were many reasons why they organised a field trip to the park. Whilst educational goals were often the primary reason for a field trip, quote 55 from teacher 2 and 56 from teacher 3 highlight that a properly performed field trip can appeal to multiple aims.

> "I think it [the field trip] was primarily to recap their knowledge, to sort of embed that knowledge more in the pupils. But certainly for all field trips there's a number of skills the pupils are going to develop, team work or you know communication or just you know being in the outdoors and all the benefits of outdoor learning and being kind of hands on and kind of seeing the places physically as opposed to just in a picture. So it [the field trip] was a combination of the gaining a greater knowledge but also developing skills from the different activities they had to do in the day." (Teacher 2 quote 55),

> "...so primarily it was the education but the fact that they are out of the classroom working with other people that they might not normally work with and they are problem-solving, they are having to think, they are working in groups, social aspects of it and the fact that they are out in public and that they are being watched also helps as well." (Teacher 3 Quote 56)

Performing informal learning activities at the park allowed the classes of teacher's number 2 and 3 to meet many of the requirements of the 'Effective Contributors' criteria. Communication, leadership and critical thinking skills are all improved through the group projects and field sketching performed during geography field trips to Loch Lomond. Through interviewing farmers and parties connected to Loch Lomond the pupils on field trips with teachers 1, 2 and 3 all achieved the curricular goals of communicating in different ways and in different settings. Also through their post visit activities the students created and developed work which reproduced their new found knowledge back in their formal learning environments. Finally the ideas of resilience, self-reliance and leadership were found to be especially important to teacher number 3 who was a strong believer in the ability of field trips to help build confidence by placing students in leadership and team building scenarios which are impossible in the classroom.

Teacher number 3's ideas were also supported by members of the park educational staff who work with many charities and youth groups. Youth groups perform many of the same educational activities as school parties but due to their nonformal educational structure they often spend more time focussing on team building and confidence exercises than learning about educational concepts. The rangers interviewed believed these activities to be a success which suggests that if any teachers wished to organise school trips which focused more on social and behavioural goals than at present then there is already the support network and expertise within the park to help facilitate this.

4.5.6 General Points Regarding the New Curriculum

The introduction of a new curriculum has greatly enhanced the ability of informal education to benefit curricular teaching. During the interviews teacher 3 noted that the previous curriculum was too exam orientated and didn't leave enough time to incorporate informal learning experiences. This is shown in quote 57.

> "You've got your N.A.B's to cover ... you know the fact that the kids are doing five Highers, the fact that they are being pulled here and there and everywhere; they've also got sort of school duties and sporting duties and extracurricular things that they are doing. You know just to propose that I am going to take them out for a day for a field trip oh oh oh." (Teacher 3 quote 57)

Quote 57 highlights why many educators believe that old Scottish curriculum had to change. An over emphasis on testing and a work load too high for the pupils meant that they were missing out on many educational activities that could really benefit them in order to meet set learning outcomes. While some feel that the new Curriculum for Excellence has moved too far in the opposite direction and is not specific enough, the new curriculum I feel is at least a step in the right direction. This chapter has shown that for each of the four capabilities it is relatively easy to bridge informal learning activities such as those at Loch Lomond with the new formal curriculum. By providing enough space within the curriculum for teachers to take time out for field trips the Curriculum for Excellence is giving informal education the time it needs to support formal education. If these trips are planned and carried out effectively then the educational benefits for many who struggled under the old system could be enormous.

Another bonus regarding the new curriculum is that by taking field trips and informal learning seriously the new curriculum has alleviated some of the problems that informal learning locations had in the past. During the interviewees many of the rangers discussed the problems of "jollies". During the old syllabus many teachers if they had some spare time and money at the end of the year would visit the park with a class for no specific purpose other than wanting a day out. Rangers would be asked to teach ideas nobody

particularly cared about and the work would be ignored upon return to the class. This was demoralising and frustrating for the rangers and a waste of time and resources. By developing a curriculum that supports field trips and through providing measures to test their effectiveness it is now less likely that these field trips will happen.

A final interesting point regarding the new Curriculum for Excellence is that many of the ideas of from Activity Theory and Social Constructivism appear to have influenced its design. By designing a syllabus that promotes cross curricular and outdoor learning the Scottish Government are supporting the idea that communities and society play a role in students ability to learn. By specifically desiring educators to get students to interact and learn in variety of settings and locations the Curriculum for Excellence can be seen as testing Il'enkov's (1977, 1982) ideas of internal contradictions being the driving force of change. Challenging young people's ideas on their role in Scottish society is important in addressing the new governmental priority on citizenship but it can also have a knock on effect in causing young people to develop a new found appreciation for the spectacular informal learning locations that they have around them. As a result of field trips organised to meet the new curriculum requirements, staff at Loch Lomond can – if they take note of the curricular goals – bridge the requirements of the park and the formal curriculum on order to support each other. This allows young people to understand and appreciate the importance of the park while also enhancing their formal educational studies resulting in benefits for the student, park staff and Scottish society as whole.

4.6 What Are The Strengths And Problems Regarding Informal Learning At The National Park?

In this chapter we have looked at the reasons why educators leave the classroom, what variables affect learning during a field trip, how field trips to Loch Lomond and Trossachs national park are structured, issues surrounding knowledge attainment whilst on a field trip and finally to what extent the new Curriculum for Excellence relates to informal education carried out at Loch Lomond and Trossachs national park. The reason for asking all these questions is that in order to answer the projects aim of how do we bridge formal and informal education in Scotland we have to look at smaller aspects of the issue in detail which elucidate the larger issue.

The final question of this chapter is entitled, 'What are the strengths and problems regarding informal learning at Loch Lomond and Trossachs national park?' Understanding the strengths and problems present regarding informal education at Loch Lomond and Trossachs national park will allow us a greater insight into the issues surrounding the bridging of formal and informal education. By tying together findings from the previous five questions as well as introducing some new themes our final section will allow the formation of an understanding that addresses the projects overall aim. The problems discovered by the project regarding informal education will be looked at first and are broken down into three areas: logistical problems, behavioural problems and Physical Problems. After having discussed the problems found at the park this section will then address the strengths of informal education performed at the park with the strengths addressed in the two sections of staff and organisational strengths.

4.6.1 Problems Regarding Informal Education

In this section the problems found by this project regarding informal education at the national park will be discussed. Logistical, behavioural and physical problems were all found with informal education performed

at the park. Logistical problems were the most commonly discussed issues with seven of the interviewees describing problems associated with this issue.

4.6.1.1 Logistical Problems

There were four areas of logistical problems found regarding informal education performed at Loch Lomond and Trossachs national park. These were problems regarding staffing logistics, transport issues, facility problems and timing issues.

Examples found of logistic problems regarding transport were mostly in regards to the busses required to bring the students to the park due to the lack of accessible public transportation available at the park. The costs of hiring busses and the requirement to fill busses in order to get value for money - which can lead to pupils being on field trips which are not necessarily relevant to them – were found to be the major transport problems found during interviews.

Facility related problems found in the interviews were the lack of places available to take pupils indoors if the weather makes outdoor education dangerous or impractical. Currently there are indoor facilities available in three park locations however one is due for closure in the near future. This places a strain on the locations which have indoor facilities as they attract far more school groups and it also means that even with a very large park at their disposal many school groups only experience a small part of the park.

A point found regarding facilities and timing issues was that there are no park run facilities which provide accommodation for overnight stays. While some parties have arranged their own accommodation at youth hostels, the level of work required by the teachers to organise this means that that vast majority of visits only last the length of a school day. This means that in practice for a visitor from Glasgow they are only working on activities in the park from around 10.30 to around 2.30 with a break in the middle for lunch. This issue of there not being enough time available at the park is a major concern especially as findings

from researchers such as Emmons (1997), Bogners (1998) and Dillon et al (2006) found that there was considerable evidence suggesting that longer programmes are more effective than shorter ones.

Of all the logistical problems found the issues surrounding staffing were the most common with 4 interviewees highlighting problems. The major logistical staffing issue found was the perception amongst the staff interviewed that there are not enough park staff and supportive resources allocated by the central park authorities to assist with education carried out in the park. It was found that out of a summer ranger staff of around 80 only 15 -20 are involved in the educational side of park activities. An additional problem found was that several staff members noted concern over not having enough time to work with school parties as they felt they were tied up doing other work such as visitor management or dealing with park bureaucracy. There was also a prevalent belief found among the rangers that education is not as high up the park's list of priorities as it should be. This is highlighted in quote 58 by ranger 4.

> "We have to do visitor management because that's where, that's what the press want. That's where you get a picture of Loch Lomond as a bomb site and it's on the front page of the Herald and they're going "Loch Lomond national park it's a S***t hole" and stuff like that. So out chief executives are all marketing media people. They want us to look dressed in pretty clothes and - I think there's £2000 each on uniforms – what I am trying to say is that we don't get any funding from the government to do education. We have got a list of… how many priorities, I think 15 priorities; visitor management is at the top and education I think comes 12th- something like that. So in order to earn our wages we have to do visitor management. Biodiversity comes in about 5th or 6th. So it all comes in above education. As individuals we fight for our education but if the crunch came to the crunch we would stop doing it because basically we wouldn't have jobs." (Ranger 4 quote 58)

This was followed shortly by another important statement by ranger 4 shown in quote 59.

> "I can't on a Saturday on Glasgow fair, I can't not do visitor management. You know if a group wanted to come on a bank holiday Monday and do some education it's just no way. If my boss found out, if the chief executive found out I probably get fired, it would be pretty serious." (Ranger 4, Quote 59)

Quotes 58 and 59 highlight some fundamental issues with informal education at the national park and in society in general. As the national park is publicly funded there is a strong desire that the public should clearly be able to see that their money is being well spent. In the eyes of the park authorities this is best achieved through making sure that the park looks good. While this is perhaps understandable given societies obsession with appearance, putting visitor management above everything else in the park means that if a ranger has to choose between teaching a school group about say the geology of the park or making sure camp sites are tidy then they will have to make sure the camp site looks nice and leave the field trip to work on their own. This means essentially we are putting the needs of tourists, recreational users and media types above the needs of our children and future generations. I think this is incredibly short sighted. Given the benefits of field trips and informal education in general in helping children in everything from understanding science concepts to making them feel part of the their local communities, it is tragic that they could be denied these opportunities as the ranger who specialises in their subject had to be somewhere else for a photo shoot.

4.6.1.2 Behavioural Problems

After logistical problems behavioural issues were the next most commonly discussed area during interviews. The issues surrounding appropriate behaviour whilst on a field trip to Loch Lomond and Trossachs national park can be broken down in to staff and pupil behavioural issues. Issues regarding staff behaviour were more common with 5 interviewees highlighting problems, whereas there were four educators who cited problems with pupil behaviour at the park.

There were few concerns regarding ranger behaviour found during the interviews. The only issue from the teachers interviewed concerned a teacher's belief that although their experience with the rangers at the national park was very positive, they believed some informal educators - as they are not trained teachers in the same way as in the formal education system - lacked the "performance" required of a teacher while educating young people.

Concerns from the park staff about behavioural problems regarding visiting teachers were more common than vice versa. The reason for this could be due to the larger number of park staff interviewed and the fact that a ranger deals with many teachers whereas a visiting teacher tends to deal with only one or two rangers.

The largest behavioural problem noted by park staff regarding teachers was the fact that some teachers use a field trip as a break for themselves, leaving the running of the entire field trip up to the park ranger. This problem was mentioned by 4 of the rangers interviewed. Other problems mentioned were a lack of understanding of who was in charge of discipline during a field trip and a perceived lack of support for the ranger from some visiting teachers. The final problem mentioned was that some of the visiting teachers approach the provision of a field trip as a way to organise a fun day out at the end of term, with little regard as to whether the pupils actually learn anything. This is demoralizing for the staff and was widely felt to be waste of their time.

Pupil behavioural issues were mentioned by two park rangers and two teachers interviewed for the project. Behavioural concerns noted by the park rangers were that sometimes teachers perhaps only bring the good students out on a field trip as they feel they either deserve it or are easier to manage. This is problematic as many of the children who are badly behaved in class act up as they are not responding well to traditional teaching methods. It is these children who would perhaps benefit the most from the informal education activities at the park and it is wrong they should miss out.

A further issue regarding pupil behaviour is safety related. The two teachers who mentioned student behavioural issues present on their field trip both believed that the change in learning environments meant that pupils were unsure how to act appropriately and so pushed the boundaries of what they were allowed to do. Incidents described during the interviews such as on one trip where pupils were given some free time and decided to go for an unsupervised swim in the loch or in another case wander off into town for some shopping highlight the fact that informal educators require must keep a close eye on what their students are up to. This is much harder outdoors and in an informal environment than in the classroom. Quote 60 describes teacher 3's thoughts on the matter.

> "I mean you want to give them a little bit of time to go out and look at it themselves...I turned my back for two minutes and again they're in there buying the pies and so on and all the rest of it. Which isn't a bad thing but you know you have just got to keep an eye on them. Anything out in the field like that you are giving them a bit of freedom but it is controlled freedom." (Teacher 3 quote 60)

This idea of controlled freedom for health and safety, as well as education reasons, is crucial for successful informal educational. It also ties in with the findings from Griffin (1998), Falk & Dierking, (1992); Hooper-Greenhill, (1991); Price & Hein, (1991); Rennie & McClafferty, (1995); Storksdieck, (2006) - mentioned in the literature review - who state that a semi-structured field trip works best in terms of educational attainment.

4.6.1.3 Physical Problems

During the interview six of the interviewees mentioned physical problems which affect informal education in the park. As previously mentioned weather can be problems for educators operating in a national park. One of the teachers interviewed noted their trip was cancelled twice due to severe weather conditions. For educators who wish to use their trip as part of class based activities then this can be a major setback.

Another issue regarding the physical conditions present in the park is that for some pupils the landscape can be physically exhausting. During the interviews teacher number 3 described a geography trip up a hill on a warm day which left several of the less physically fit pupils out of breath and uncomfortable. While this may not necessarily be a bad thing it is something that educators should be aware of. A final issue regarding the parks diverse weather is that often students who visit the park – particularly from urban areas – are inappropriately dressed for the weather and the terrain. Quote 61 from ranger 1 described the situation.

> "I've seen the shocked faces when they get off a bus and they haven't dressed for the occasion and they're wearing a really nice white pair of trainers and you know they're like "there's midges and ticks! You didn't tell me about that!" you know and we do try and there's information on the website for the teachers about what they should be bringing and you do try and make them a bit aware about it but you know you think, national park! That should ring a few bells..." (Ranger 1, Quote 61)

Quote 61 highlights both an issue of educating pupils outdoors who are unaccustomed to it and also of the need for this to happen. The fact that some urban children are unable to visualise what visiting the countryside will be like and what they should wear, even with guidance, clearly highlights the divisions there are in this country between urban and rural children. There is a need to expose inner city children to the countryside for a whole range of social and mental benefits. What this projects findings suggest is that currently urban children they are not experiencing the countryside enough out of school hours and that field trips could go a long way to improving the situation.

4.6.1.4 Summary of Problems Found with Informal Education at the Park

From the literature review and the finding in this chapter there were a variety of problems found with informal education and field trips in particular. In the literature review educational research suggested that problems which could occur on a field trip fall into three main categories: a lack of preparation and post visit activities, a lack of field trip structure and finally the use of inappropriate teaching methods. It was interesting to look at the results from this investigation in regards to these academic findings in order to understand how common these issues were at the national park and also to discover if there were any site-specific problems which were not highlighted through academic research.

In regards to field trips suffering due to a lack of preparation the findings from this investigation suggest that at Loch Lomond this is not an issue. All of the teachers interviewed included pre and post visit activities and actively tried to link the field trips educational points with work that was being carried out in class. Pre-visit talks and orientation involving teachers and park staff are common at the park but are limited to schools which are close to the park. This is due to lack of time available for the park rangers to travel out to schools as education is just one of their many jobs. While this is a concern and ideally all students visiting the park should have a pre and post visit meeting with park staff and educators, unless there is a large increase in rangers employed - which for public funded bodies in the current political climate is highly unlikely – then this will remain unlikely.

Problems surround the structure of a field trip were found in this investigation but interviewees believed their occurrence was rare. As mentioned, the provision of pre and post activities lessened the 'novelty affect' and consequently none of the interviewed educators saw introducing students to a new learning environment as problematic. Interestingly many interviewees said the new learning environment was actually beneficial to the student's education.

Other problems highlighted in the literature review regarding an over structuring of the field trip were found to some extent. Park staff interviewed stated that some educators while planning a trip pick sites that are impractical to cover in the allocated due to travel times and logistics. They did however emphasise that there is a communicative dialogue between visitors and park staff before an excursion which usually prevents these problems. In terms of over structuring activities this was found in some cases in the park but not in all. Being tied into travel times and the school day along with rigorous health and safety precautions and the need to show educational attainment meant that in many cases a higher degree of structuring was required than the academic literature would have ideally envisaged.

In regards to the behavioural issues listed in the literature review such as teachers using formal teaching methods in informal environments or teachers leaving too much of the running of a field trip up to the informal educators, these were found to be present and relatively commonplace at the park. A lack of understanding of who is in charge of maintaining discipline whilst on a field trip was an area of concern for the interviewees, as was the belief amongst park staff that some visiting teachers did not approach the field trip with the level of seriousness required. Some of the rangers interviewed however felt that the implementation of the new curriculum with its emphasis on outdoor learning would make these occurrences less likely.

Overall there were some issues found during the project which were not foreseen through the literature review. Physical problems such as the weather and terrain were not found in academic literature but were found to pose a large problem to park educational visitors. Behavioural issues found were broadly similar to those discussed in the literature with the same issues of a lack of appropriate teacher behaviour, and the problems of maintaining students' discipline, featuring during interviews.

Practical logistical issues were more of a concern for the park than were suggested from the literature review with concerns about facilities available and the amount of time during the field trip to perform activities raised. The final important point regarding the logistics of informally educating large numbers of students at the park was found to be the severe strain that this placed on the park educational staff. While

all the staff interviewed enjoyed the educational aspect of their work it is however only a part of their overall job. Even the 'Learning Development Advisor' who is in charge of informal education at the park has other job requirements such as looking after volunteering issues and also water conservation.

There was the overall feeling throughout the project that although the park staff interviewed for this project were passionate about informal education and professional in their conduct they were lacking in support from higher management levels - and ultimately government bodies - who are not viewing the national park as being as important for education as it is for tourism or recreation. This lack of will to emphasise and support Scottish informal education sites means that staff who do work on projects where the formal and informal learning environments meet are frequently overstretched and often overlooked by government educational planning and support. This is a waste of valuable resources which, as this project has shown, have much to offer and support the formal curriculum and the wider Scottish society.

4.6.2 Strengths Found with Informal Education At The Park

During the literature review it was shown that a variety of academic researchers have found that informal education brings a host of benefits. However none of the academic research reviewed was performed in a Scottish setting and relatively little informal educational research in general deals with national parks. It was therefore important for the final aspect of this project to investigate what the strengths of informal education at Loch Lomond and Trossachs national park are and how outdoor informal education benefits the formal education performed in Scottish schools.

4.6.2.1 Organisational Strengths

Of the issues regarding strengths found at the national park those concerning the organisation of the field trips were the most commonly discussed with 7 of the interviewees focussing on this area. Particular

strengths mentioned were the willingness of the national park authorities to provide their education staff with the tools or materials which they feel are necessary to facilitate their field trips. Secondly another strength mentioned by interviewees was the diversity of the backgrounds to the staff working at the park. The national park ranger service recruits people with a variety of different job histories and consequently there was a belief found amongst interviewees that student's listening to the park educators were learning about ideas and experiences from not just the national park but from all over the world of employment. The final strength noted through interviews regarding the organisational skills of the park staff was the ability of the park staff to communicate effectively with the field trips coming to the park to discover precisely what they desire from their excursion. This was shown in quote 62 from teacher 2 and quote 63 from teacher 3.

> "I think they already had quite a good idea of the intermediate course and where it could tie in with what we were studying, and certainly during the actual trip they were linking it in with what they should know about. So they certainly seemed to have quite a good idea of the standards that they should be educating the pupils to." (Teacher 2 Quote 62)

> "Yeah it was just ideal. Everything was geared up for what we wanted with the kids. It was tailored to what we wanted, we had good local examples that I wouldn't necessarily off have picked out, and yeah I couldn't really fault it. I'd definitely put it in next year and yeah ask for the same again...I wouldn't change it again, it was ideal." (Teacher 3 Quote 63)

The key to bridging formal and informal education is in understanding what educational ideas both areas are trying to convey and how they are achieving this. Through constructive dialogue throughout the field trip's planning process and an awareness of the current requirements of the formal curriculum the national park has managed to create a way of incorporating the local strengths of the park with the desires of the visiting parties in order to create, in one case, the ideal informal educational experience.

4.6.2.2 Staff Strengths

The strengths found in the interviews regarding the staff at the national in many ways overlap with the park's organizational strengths. One of the greatest strengths of the national park organisation is that its flexible decentralised educational structure allows its rangers to specialise on areas that interest them and that they are passionate about. Additionally the parks management also encourage that rangers find ways of connecting these specialist areas with the curriculum in order for visitors to achieve the educational outcomes desired by the formal education system. This is enormously useful in helping to bridge informal and formal education.

From the interviews there were many positive qualities found regarding the park educational staff. The park rangers who facilitate outdoor learning were seen as friendly, approachable, enthusiastic, accommodating and as part of the local community. Informal learning with its emphasis on voluntary participation and its flexible structure requires educators to maintain the interest of students to a greater extent than in formal education. The personal qualities used to describe the educational staff at Loch Lomond suggest that the people involved in the presentation of the informal educational activities are well suited for the job.

A final point of note regarding the strength of the staff available at the national park was the high levels of personal enthusiasm and job satisfaction found amongst the park staff throughout the investigation. Examples of this are shown in quotes 64 from ranger 4 and 65 from ranger 6.

> "That's why I'm in this job I guess. I mean it's not really a career for me it's more of a vocation getting to preach to the masses." (Ranger 4 Quote 64)

> "Yeah we've got the best job in the world and we know that, and I don't think there is one person here who doesn't think that and if they do then they don't tend to last long, they tend to leave cause I don't think they can stick the fact that we are all so enthusiastic about it." (Ranger 6 quote 65)

Having a staff base who enjoy their job and are passionate about their subject makes it much easier to teach young people outdoors and makes it far more likely the students will become interested in subject area too. Evidence of this is shown in quote 66 from ranger 3.

> "I think instilling a sense of interest, lighting a spark. I think that's something we do quite well because people see what we do and then they, you know it's quite funny, you always get at least one kid per group who goes, 'oh I wanna be a ranger'. And you know it's quite nice to kind of think aw wow I've instilled just that little bit of interest in you, and hopefully it will grow. And you know I always tell our visitor groups, senior or secondary I mean, that we do do voluntary duties and you get lots of them kind of signing up to that as well. So they are taking it on and taking it further so I think that is something that we are quite good at as well, is actually kind of getting a spark and following it up." (Ranger 3 Quote 66)

Quote 66 highlights the final important point regarding good informal education in that it isn't, and shouldn't be, a standalone event. Education has the ability to change people's perceptions and understanding of the world but also just as importantly to change their behaviour and how they act. Currently there is large drive politically to involve more people – particularly young people - in volunteering and playing an active role in their communities. People are unlikely to volunteer for projects or organizations they know little about. Therefore having an informal learning event such as field trip to an area where charities and non-governmental organizations are working shows young people exactly what work is currently going on, why it's needed and also encourages them to find out more and to join in themselves. Lighting this spark and engaging young people is the challenge of many modern day educators. The fact it is being performed successfully at Loch Lomond is a credit to the organization and the strength of its staff.

4.6.2.3 Summary of Strengths

The strengths of informal education in regards to the national park, its staff and its management can be found in two sections of this investigation. In the first section of this chapter the reasons why teachers and educators visited the national park were noted and discussed. From these findings strengths were found in regards to the national park, its location, staff and facilities. The park is seen as prime example of a location where many of the geographical and social and cultural issues featured in the curriculum can be seen in a real world setting. The park staff's ability to show teachers and pupils first hand examples of what they are studying in school is major strength of the park and also helps bridge the formal and informal learning environment. Interviewees believed that the field trips provided at the park reinforce and ties in with school work, and that the active learning performed on the field trips is both a reason to visit in itself and that the excursions leave positive memories towards the subject area as well as changing student attitudes.

From both the first section of this chapter looking at reasons to leave the classroom and the final section covering any other strengths found at the park it was noted that a major advantage in pursuing informal education at the park was the ability of field trips there to get pupils outdoors and into the local community. Teachers also believed it was good to get students hearing voices other than their teacher regarding their subject and to learn about the volunteering opportunities present locally. The passion with which the park staff approach their subject goes some way to explaining the teachers views.

Overall the investigation has shown that the national park possesses many natural strengths. A synopsis of these strengths are shown in quote 67 from ranger 1.

> "I think from the national park point of view it's the fact that we're seen as the pinnacle of if you like landscapes/ heritage, you know cultural biodiversity. You can see all these things in minute detail in local parks, in country parks.... your school grounds and so on, but a visit to the park seen as the pinnacle of that... and that's where our strength is." (Ranger 1 Quote 67)

Most people when thinking of a national park think of its physical attractions. Quote 77 mentions this but also brings in the idea that the park isn't just a standalone attraction showcasing one feature. The park's physical attractions and its informal learning opportunities are in many ways a larger and more obvious version of the informal learning opportunities present near or at the schools and formal education locations the students and teachers come from. The key to bridging informal and formal education is in encouraging teachers and students after their visit to the park to explore these locations themselves and to lead their own informal active learning activities. While there is a desire amongst the educators interviewed during this project for this to happen, most conceded that at present this was not commonplace. Until this normalization of informal learning happens and becomes accepted by the formal education system then it is likely that the spheres of informal and formal learning will continue to be regarded separately in Scotland to the detriment of its students and communities.

5 Summary

This chapter will summarize the investigation into bridging formal and informal education in schools. The first section of the summary will recap the major findings of the investigation, following the same chronology as the report. The chapter will begin with a summary of the introduction and methodology, briefly recapping the project's original aims, theoretical framework and construction. Next the main findings of the literature review, results and discussion will be covered, both in regards to the six smaller research questions and to the project's overall motive. There will then be a brief conclusion of the overall findings.

The second section of this chapter will deal with strength of the findings of the report and indicate any areas requiring further research. Limitations and improvements will also be covered in this section as well as a description of the significance and value of the report's findings. The final section of this chapter will suggest an agenda for future research.

5.1 Introduction

In the introduction the project addressed the need for a Scottish education system that fully embraces both the current formal academic system and Scotland's wealth of informal learning locations. Bridging the educational work performed in Scotland schools with the resources and specialties of its informal learning locations such as national parks museums and science centres would provide many benefits for pupils, teachers and society. The introduction of the new Scottish Curriculum for Excellence, with its emphasis on cross-curricular and informal education, suggests a political eagerness to embrace informal learning. However currently there is little research on the practicalities and personal experiences of educators facilitating this bridging of informal and formal education. This project addresses these issues.

The introduction described the reasoning behind the selection of Loch Lomond and Trossachs national park as a case study site due its popularity, location and the variety of educational activities performed there.

In order to address the projects aims of investigating the bridging of formal and informal education six smaller questions were developed which provide an insight into the larger issue. The questions are listed below:

- Why are teachers and school parties visiting the park's informal learning environment?
- When the field parties are at the park what are the variables that affect learning?
- How are field trips to the park structured?
- How is knowledge attained on a field trip?
- How does the informal learning facilitated at the park connect with the new Curriculum for Excellence?
- What are the strengths and problems regarding informal learning at Loch Lomond and Trossachs national park?

These six questions were then addressed in the literature review and the results and discussion section.

5.2 Methodology

The methodology chapter of the investigation consisted of two sections, the theoretical framework of the project and the practical techniques utilized to address the investigation's aim.

In the methodology section the lack of contemporary research into outdoor education in the UK - and in its national parks in particular – was noted. Due to this lack of available background research the ideas and techniques of 'Grounded Theory' were employed during the project. In addition to 'Grounded Theory' the theoretical paradigm of 'Activity Theory' was discussed and utilized during the project. The interpretation

and uses of tools in outdoor learning were discussed in the methodology section as well as the role that surrounding community plays on students educational experience. Finally ideas surrounding the notion of internal contradictions being the driving force of change in activity systems were looked at in regards to learning in the national park.

In the second section of the methodology chapter the practicalities of putting the theoretical ideas discussed into practice were addressed. The use of 'Phenomenography' to discover a 'typical' field trip to the park was used in this project, and from this 'typical' trip it was then possible to discover the strengths and weaknesses of informal education in the national park. Finally the usage of semi-structured interviews to obtain the information needed to answer the project's research questions was discussed, with the importance of interviewing both visiting teachers and park educators noted.

5.3 Literature Review, Results and Discussion

The literature review, results and discussion chapters collectively addressed the project's aim. As previously mentioned this aim was investigated through the use of six sub questions to provide an insight into the various components which influence the bridging of formal and informal education. A summary of the results will follow under the headings of the six sub questions. Ideas found in the literature review were compared with results from the interviews performed at the park to provide a guide to the general picture regarding bridging formal and informal education and also to highlight any site-specific issues. The literature review also described the current debated regarding the terminology usage of informal, formal and non-formal education. For this project it was decided that the term 'non-formal' refers to youth group education work such as that performed by Scout or Guides, 'formal education' refers to all education performed in schools and based on the Scottish curriculum and 'informal education' refers to learning which is outside of the classroom and the school environment but is still aimed at school parties.

5.3.1 Why Leave The Classroom?

In order to better understand the bridging of formal and informal education it was important to look at the reasons educators left the classroom and why they organised informal learning experiences. In the literature review reasons found for leaving the classroom were: the excursions capability to demonstrate and illustrate objects or phenomena that are not accessible in other settings; the discovery that field trips and informal learning helps students relate their classroom studies to the wider world; that field trips have been scientifically shown to deepen conceptual development and reinforce concepts previously presented in the classroom; the ability of field trips to foster positive student attitudes in both genders and finally the beneficial affect that field trips can have on inter-student and student teacher relations. The literature also suggested that the most important reason that educators should leave the classroom with their students to participate in some informal learning is that a well prepared and properly performed field trip can have produce all the benefits suggested within the one excursion.

Results from the interviews performed at Loch Lomond revealed that educators visited the park for the following reasons: field trips to the park show children first hand examples of what they are studying in school; field trips reinforce and tie in with school work; field trips allow active learning; excursions leave positive memories towards the subject area and change student attitudes; field trips get pupils outdoors; exercising and into the local community; that it is good to get students hearing voices other than the teacher regarding the subject; that a field trip can encourage students to choose a subject in the curriculum and finally, that the park was chosen as a location for the field trip as it was close by and had good facilities that accommodated all the aforementioned goals.

Many of the reasons for participating in informal education listed in the literature were found at the national park. However issues regarding the ability of field trips to get students exercising, hearing new teaching voices, experiencing different teaching styles, and the ability of field trips to encourage pupils to further study the subject were new findings discovered by the project.

5.3.2 What Variables Affect Learning Whilst At The Park?

Having looked at the reasons for visiting the national park, it was important to discover the variables that affect learning during a field trip. Understanding the variables which affect leaning on a field trip allows for a more effective field trip and makes it easier to bridge the informal learning on a field trip with formal curricular work.

In the literature review the variables found which affect learning whist on a field trip were: the length of a field trip, levels of motivation and expectation, prior knowledge, experiences and interests, levels of choice and control and organisation, within group social mediation and facilitated mediation by others, advanced organisation, pre-visit orientation, physical environmental conditions, the design of the activities and also that student levels of learning were affected by the interaction of the three realms of teachers, students and the physical environment. It was also found that all of the listed factors may influence a field trip to differing degrees with no factor being consistently dominant or weaker.

From the research performed at the national park the variables found to affect learning were: the level of facilities available at the field trip location, class size, health and safety issues, the length of a field trip, whether the trip was part of larger classroom based project, the provision of a pre-visit orientation, weather issues, staff and student attitudes towards the trip and finally the affect that having a different educator can have on a student learning levels.

Many of educators interviewed for the project listed the same variables they believed influenced their field trip as were found in the literature reviews. However it was found from the investigation that there was a stronger emphasis placed on the role that the weather has on the success of a field trip than would have been suggested through the reviewed academic literature. This also affected the emphasis placed by interviewees on the role that the availability of park facilities play on the trip success rates. Finally amongst visitors to the park issues regarding the amount of time available to participate in educational activities were a common concern.

5.3.3 How Are Field Trips To The Park Structured?

Having looked at the variables that affect the bridging of formal and informal learning it was important to look at how field trips are structured and how they respond to these variables.

From the interviews performed at the national park it was found that the structure of a field trip was very dependent on the particular educator leading the field trip. Field trips were found to be were designed through a dialogue between the park staff and the visiting school party. The extent to which a field trip was structured was dependent on a variety of factors such class size, location, which ranger is working, the desired outcomes of the teacher, the age and behaviour of the class and the activities pursued on the day.

Having found in the literature review that semi-structured field trips work best it was interesting to find that these were commonplace at the park. Complex activities such as those involving boats or a number of tools were however found to be more structured than other simpler activities. A dialogue before a field trip between the parties involved allowed for the construction of a field trip which met the needs of the visiting school group. This limits time wastage and assists with the bridging of formal and informal education as it prevents the trip focussing on areas which are irrelevant to curricular work.

The literature review suggested that longer trips are more effective trips. A finding from the project was that many of the educators visiting the park were aware of this but felt that spending more time at the park was problematic due to a need to adhere to the school timetable. A lack of facilities to provide overnight accommodation was found to limit many field trips from Glasgow to around 2 – 3 hours, which was widely felt to be insufficient.

The park was found to possess no set educational programme with educators focusing on areas which have been traditionally asked for. However some of the park staff interviewed were keen on developing a standard programme.

5.3.4 Knowledge Attainment

Assessing the levels of knowledge attainment possible on a field trip to the park was made through investigating ideas regarding informal education, the structuring of field trips and the variables which affect informal education.

In the literature review effective field trips were found to contain: pre-visit preparatory work, a loose structuring of fieldwork activities during the outing and appropriate post visit activities. The extent to which these factors were present during trips to the national park were investigated during the project.

Interviews at the park found that pre-visit activities such as orientations or ranger talks were relatively common for visiting school parties. However the existence and length of the talks were dependent on the distance from the park to the visiting parties school. It was also found that where distance prohibits the visitation of a ranger to a school then park staff are investigating new ways such as the use of webchats and video presentations to make sure these school parties received pre-visit activities.

Post-visit activities involving the park staff are almost unheard of, however some teachers interviewed stated that their pupils performed followed educational work after the trip at school, although not with the park staff.

While the numbers interview for this project were relatively low, the discovery that educators are linking some classroom studies with park based fieldwork shows that in some cases informal and formal education is being bridged at the national park.

Ideas surrounding the 'novelty effect' were discussed during this project. Some academic literature suggests that a sudden change in learning environment may cause problems for students and hamper their ability to learn. Other literature however suggested that a change in learning environment can actually be beneficial to students as it challenges previous norms and causes new ways of thinking.

Negative issues found during the interviews regarding the novelty affect were found to be: behavioural issues regarding how the pupils should act in the new environment, student's not listening to the ranger as they would a teacher in school, the wearing of inappropriate clothing and lack of awareness surrounding outdoor weather conditions and finally that some student's at the park felt out of their comfort zones.

It was interesting to discover that none of the interviewees regarded the 'novelty effect' as a particularly large issue and two interviewees felt that challenging the pupils through a transition in learning environments was a very good thing. Positive issues regarding the novelty factor were found to be: its ability to increase social skills like leadership and team building, that it provides the students with more educational freedom and that it allows students who previously weren't performing well in the classroom environment the chance to learn in a different way. These findings are broadly in line with the current academic debate regarding the issue.

The provision of pre-visit activities lessens the negative aspects of the novelty affect. Consequently this may explain the predominantly positive participant attitudes regarding the suspect.

As worksheets are a common tool used in informal learning issues surrounding their use were also looked at by the project. Academic literature suggested that worksheets were found to be either a bonus or a hindrance depending on their usage. Academic proponents suggested that worksheets can be beneficial as many teachers are comfortable with them and informal learning environments are happy to provide them. Research also suggested that some teachers and pupils felt that their learning was supported by worksheets and also that worksheets can promote discovery and an inquiry-style field trip experience as well as focus student attention onto certain aspects of the trip deemed to be important. Negatives aspects regarding worksheets were found to be that they can cause an over structuring of the field trip, that they can constrain pupil behaviour, and that often worksheets possess too detailed questions that do not allow pupils to explore and engage with the unique experience that informal learning allows. In essence it was found that

many educators use worksheets as an instrument to impose formal learning practices in informal environments.

In synopsis many of the problems noted by academic research regarding worksheets were found through the interviews undertaken at the park with some for and some against their usage. New issues such as worksheets being impractical in the rainy weather and the fact worksheets can be off putting for teachers were discovered. These were points which were not found through the literature review. The ability of work sheets to encourage teamwork was also an issue which was not found in the literature reviewed.

5.3.5 Connecting Informal Learning With The New Curriculum For Excellence

The investigation was conducted whilst the Scottish formal education system was in a state of flux. The implementation of the new 'Curriculum For Excellence' had begun for some school parties visiting the national park but not others. However, eventually all formal education in Scotland will follow the new curriculum. The new curriculum was based on four key capacities: 'successful learners', 'confident individuals', 'successful learners', 'responsible citizens' and 'effective contributors'. The informal learning activities performed at the park were investigated in relation to these capacities as well as the other issues such as cross-curricular learning and outdoor education.

Regarding the capability of 'Successful Learners' the informal educational work performed at the national park correlates to curricular designs. An emphasis on fun, group work and active learning met curricular requirements. For areas such as technology use, which are traditionally less associated with national parks, park staff were aware of this requirement and were facilitating ways to integrate this into informal learning activities performed at the park. This showed flexibility amongst the informal educational staff, one which is required for the bridging of formal and informal education.

For the ‘Confident Individuals’ capacity park activities such as group work, individual work and getting children moving around outdoors benefits students’ benefited students mental physical and emotional health. Educators believed that getting students to interact with tourists, rangers, farmers and other students helped students to become self aware, confident and to relate better to other people through developing their communication skills in real world environment. It was also found that park staff are attempting to move away from solely teaching traditional subject areas such as Geography by finding was of teaching literacy and other subjects at the park.

The criteria of the ‘Responsible Citizens’ was found to relate easily to the park’s own programme of teaching young people about respecting the local environment. The investigation of by-laws, unmanaged park locations and studying cases of vandalism within the park was said by interviewees to provide real world examples of formal curricular concepts. This linked informal activities at the park with formal school work and benefited both educational parties.

The final capability of ‘Effective Contributors’ was addressed through performing informal learning activities at the park. Communication, leadership and critical thinking skills were taught through group projects with examples being the field sketching performed during geography field trips to the park. Curricular ideas such as leadership were found to be especially important to one teacher and three of the rangers.

The introduction of a new curriculum was found to enhance the ability of informal education to benefit curricular teaching. Curricular requirements have meant that informal education is seen less as simply a fun day out than previously. Also the more flexible nature of the new syllabus has allowed for the creative development of novel educational activities within the park, addressing a broader ranger of subjects than before. However, even with the advent of the new curriculum the majority of secondary school field trips to the park are predominantly from subject areas such as geography which have traditionally always visited the park. There will need to be a greater drive amongst non-traditional subjects if the parks educational potential is to be met.

5.3.6 Problems Regarding Informal Learning At The National Park

Evaluating the strengths and problems found regarding informal learning at the park highlighted the benefits and difficulties of bridging informal and formal learning. Problems were broken down into logistical, behavioural and physical problems.

Logistical problems discussed during interviews covered staffing logistics, transport issues, facility problems and timing issues. Transport issues found were a lack of infrastructure within the park leading to an over emphasis on the south of the park; the high cost of bus hire and a requirement to fill buses leading to pupils visiting the park who perhaps should not have been on the trip.

Facility related problems found were the severe lack of places available to take pupils indoors if the weather turns bad. Currently there are only 3 locations available in the park for this, with one due for closure. There was no also overnight accommodation provided by the park for school parties.

Of all the logistical problems found the issues surrounding staffing were the most common. The major logistical staffing issue found was the perception amongst the staff interviewed that there are not enough park staff and supportive resources allocated by the central park authorities to assist with education carried out in the park. An additional problem found was the concern over not having enough time to work with school parties as they felt they were tied up doing other work such as visitor management or dealing with park bureaucracy. There was also a belief found amongst the interviewees that education is not as high up the park's list of priorities as it should be; this was explained by a perceived organisational over emphasis on visitor management.

Behavioural problems found regarding informal education at the park were the fact that some teachers use a field trip as an excuse to ease off their role as an educator leaving the running of the trip entirely up to the

park staff. Other teachers were described as not approaching the trip with the appropriate attitude, simply seeing it as a fun day out rather than an educational opportunity. Issues regarding an uncertainty of who disciplines unruly students during a field trip, and of certain students being unsure of how to act appropriately in an outdoor environment were noted by the project. Some of the rangers interviewed however felt that the implementation of the new curriculum with its emphasis on outdoor learning would make these occurrences less likely.

Physical Problems highlighted by the project were: severe weather conditions delaying or limiting access to the park, that some pupils were too physically unfit to participate in some of the outdoor activities performed at the park and finally that there are frequently pupils who turn up in inappropriate clothing for outdoor informal education.

Overall there were some issues found during the project which were not foreseen through the literature review. Physical problems such as the weather and terrain were not found in academic literature but were found to pose a large problem to park educational visitors. Behavioural issues found were broadly similar to those discussed in the literature with the same issues of a lack of appropriate teacher behaviour, and the problems of maintaining students' discipline, featuring during interviews. There was also a feeling that higher management levels, within the park and formal education system - and ultimately government bodies - are not viewing the national park as being as important for education as it is for tourism or recreation.

5.3.7 Strengths Found with Informal Education at the Park

The strengths section of the project covered any general strengths, which were not covered in the previous chapters.

Particular strengths found during interviews were the willingness of the national park authorities to provide their education staff with the tools or materials which they feel are necessary to facilitate their field trips, the diversity of the backgrounds to the staff working at the park and finally the ability of the park staff to communicate effectively with the field trips prior to visiting the park to discover precisely what they desire from their excursion.

One of the greatest strengths of the national park organisation is that its flexible decentralised educational structure allows its rangers to specialise on areas that interest them and that they are passionate about. Additionally the park encourages rangers to find ways of connecting these specialist areas with the curriculum in order for visitors to achieve the educational outcomes desired by the formal education system.

The park rangers who facilitate outdoor learning were seen as friendly, approachable, enthusiastic, accommodating and as part of the local community. A final point of note regarding the strength of the staff available at the national park was the high levels of personal enthusiasm and job satisfaction found amongst the park staff throughout the investigation.

5.4 Main Findings and Conclusions

Bridging formal and informal education is important and would benefit pupils, teachers and the wider Scottish society.

There is currently only a small amount research performed on the area in a Scottish context.

The national park was used as a case study to investigate wider Scottish issues regarding the bridging of formal and informal education.

People were found to visit the park for many educational and social reasons, which were not mutually exclusive.

There are many interacting variables that affect informal learning with weather and the availability of facilities being particularly import regarding the national park.

The perceived beneficial ability of field trips to get students exercising, hearing differing teaching voices, experiencing different teaching styles, and the ability of field trips to encourage pupils to study the subject were new findings discovered by the project.

Field trip structures varied depending on the activity and organiser. There was no standard park programme and no joint education strategy for Scotland's two national parks.

Ideal field trips should contain pre and post visit activities follow a semi-organised structure with longer excursions being more effective. However there is no park run overnight accommodation provided and few indoor educational locations.

Attitudes regarding worksheets were broadly similar to those found in the academic literature with some for and some against. However attitudes towards the novelty affect differed from the literature with few interviewees perceiving any detrimental educational affects regarding educating pupils in new learning environments with many advocating teaching pupils outdoors.

The investigation was carried out a time of great change in the formal Scottish education system. The new curriculum was found to be more favourable to informal learning than the previous syllabus.

Many informal educational activities run at the park already met formal curricular goals. There was a willingness amongst park staff to organise activities to meet new curricular goals and to embrace new technologies and activities which would allow this.

There are some logistic, behavioural and physical problems, which are currently limiting the degree to which the national park can assist in the bridging of formal and informal education. Transport issues, local facility availability and the requirement of staff to simultaneously pursue other non-educational aims were problems found during the investigation.

The park was found to possess many organisational strengths, strong educational attractions and have enthusiastic, flexible and approachable staff.

Regarding informal education in general the project found that there was perceived to be a new drive to increase student exposure to informal education. However at the time of conduct this was mainly carried out by certain enthusiastic educators and the majority of students visiting the park were from 'traditional' park visiting subjects such as Geography. Bridging formal and informal education is possible in Scotland and was found to be present at the national park, however its importance and requirements are complex and often overlooked by the Scottish formal education system.

5.5 Comment on Findings

The results from the investigation are import in that they are one of the few studies looking at the current bridging of formal and informal education in Scotland. Scotland's national parks are a relatively recent development (Loch Lomond and Trossachs national park was opened in 2002 and the Cairngorms national park was opened in 2003) and so there has been little educational research performed on their usage or educational potential. The results of this project are valuable in that they provide an insight into site-specific issues regarding the bridging of formal and informal education but also elucidate many of the larger issues facing informal education in Scotland, the UK and beyond. National parks provide a variety attractions to tourists, business people and locals, however their educational potential is often overlooked. This project sought to address this issue.

Due to unexpected developments during the investigation the project was not able to focus in depth on all of the areas which were desired. A substantial gap in the project is that no students were interviewed during the project. It would have been interesting to gauge student attitudes regarding the importance of informal education and their perceived issues surrounding formal education. Regrettably due to limited time and unforeseeable circumstances this was not possible for the project. Secondly it would have been beneficial for the project to assess the levels of educational attainment resulting from informal education at the park and to have performed at study to discover if certain methods of bridging formal and informal education were more productive than others. Sadly due to lack of time available this was impossible, however it would be a valuable area of future research.

A limitation of the project is the relatively low numbers of interviewees. Due to the summer school holidays and other factors it was easier to access park educational staff than visiting teachers. Consequently there was a greater number of park staff interviewed than teachers. It would have been preferable for the project to interview additional teachers to discover more about their views regarding informal and formal education, however this was not possible. Another limitation was the severe lack of academic research found regarding outdoor learning in the UK and Scotland in particular. Whilst there is a relatively large body of education research regarding national parks it is predominantly North American. There are many differences regarding the scale and number of the national parks in Scotland and North America with UK national parks having different aims and issues than their American counterparts. Another limitation was that the majority of academic research regarding informal learning addresses museum learning and science centres. Due to the vastly larger number of museums than national parks this wasn't surprising however it was in some aspects problematic for this project.

Improvements to the project would consist of a larger number of interviewees, including the views of students visiting the park. Individually observing field trips at the park would allow for a greater analysis of the projects theoretical framework and in particular the ideas surrounding activity theory and tool use. Secondly it would have been interesting to interview park educational staff from both national parks,

however due to the large distances involved this was impractical for the project. A major issue regarding the project was that it was conducted at a time of change within the formal education system due to the implementation of the new Curriculum for Excellence. There was a feeling amongst interviewees that the new curriculum would make bridging formal and informal education easier in the future. Consequently it would be valuable to return to many of the ideas of the project in the future when the formal education system is more settled.

Overall the project gives a description of the current situation relating to the bridging of formal and informal education, both in general and specifically relating to national parks. The project found that the bridging of formal and informal education is possible and is currently evident in Scotland's national parks. However this bridging is not commonplace and relies on the work of a few dedicated individuals who see the benefit of widening student's education experiences. A useful area of future research would be to understand how to involve more formal educators in areas of informal education so the utilization of these educational fields become less reliant on certain dedicated individuals.

Due to the similar experiences that modern societies are facing, many of the issues raised by the project are important beyond Scotland. The increased urbanisation of society risks creating young people who are out of touch with the natural world and the positive social, mental and educational benefits it can give. By understanding how best to harness the potential of informal education students can gain more from their education than is currently occurring. Informal learning has been shown by this project to have multiple educational benefits, vastly helping students socially, academically and those currently disengaged from the formal education system. By better understanding how to combine the best of the formal education system with the distinct advantages of informal education then it is possible to give young people the quality education that they deserve.

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7 List of Interview Quotations

Teacher 1 Quote 1) “We wanted to identify glacial landscapes getting them to actually look and pick out corries and sort of U shaped valleys and also looking at land use in the area and sort of conflict issues and just experiencing what goes on in the national park and what the national park aims and what are the duties are of the national park rangers.”

Teacher 2 Quote 2) “Well the main kind of focus seemed to be conflicts, land use conflicts, we did a lot of that, you know looking at vandalism or the use of speed boats; of just the different users of the park you know how they conflict.”

Teacher 3 Quote 3) “...it [the field trip] reinforced what we were doing in the class and gave them different aspects. It's given them the chance to actually see things that I wouldn't of, you know we can talk about it show them a video of it, of areas that are littered, but to actually see it, to see the people coming in and to see the potential conflicts there could be and interact with it was invaluable. To actually run their own questionnaires of the facilities that were available and how the managed site had more than the unmanaged was, yeah, extremely valuable.”

Ranger 5 Quote 4) “The things they [teachers] seem to want are land use conflicts, geology and part of that is techniques so you will. They ask for as part of the field trip they have to do a part of techniques, outdoor practical techniques so field sketching is a common one. We have done measurement of path erosion through plenometers and photographs and sketching and filling out forms”

Ranger 6 Quote 5) “I’ve heard a lot of the teachers say to me that there are some questions that kids don’t answer that well no matter how much they talk to them about them and read to them about it they really need to come out here and see it, feel it, touch it and so a lot of these groups that is what they are coming out for”

Teacher 2 Quote 6) “Certainly for all field trips there’s a number of skills the pupils are going to develop; team work, or you know communication or just you know being in the outdoors and all the benefits of outdoor learning and being kind of hands on and kind of seeing the places physically as opposed to just in a picture. So it was a combination of gaining a greater knowledge but also developing skills from the different activities they had to do in the day.”

Teacher 1 Quote 7) “I think it [the field trip] was primarily to recap their knowledge, to sort of embed that knowledge more in the pupils.”

Teacher 3 Quote 8) “It was a standard grade group. I said the sort of things that I wanted to do, I had given them a sort of heads up on what I had actually covered with the kids beforehand the sort of input that they had before they came out and really it was the case that I wanted to reinforce those in the field with any of the sort of local case studies that they could give me and yeah that worked really well.”

Ranger 4 Quote 9) “I try an link them [classroom and outdoor education] together and if there’s something that the teacher tells me they are doing in class and it links to what we are doing then we’ll try and focus on that”.

Teacher 2 Quote 10) “I think it [the field trip] gives them a greater understanding and when they’re doing their exams or sitting in class you know they can attach the memories of that day to what they need to write down. Probably more so because its not as if they do it every week so it’s more of a unique experience so they will kind of remember it.

Teacher 2 Quote 11) Interviewer: “Did you find any strength’s for the informal education provided at the park? Either strength’s of the staff or strength’s from the settings?”
Teacher 2 “Yeah I don’t think there’s much to add. Just what I’ve said in terms of the pupils gaining a totally new experience, a unique experience in terms of how they’re learning.”

Teacher 3 Quote 12) “We’d looked at an unmanaged site north of Balmaha, we looked at the managed site on Inchcailloch, the beach on the far side. There was still a lot of good geography going on but it was also good fun.”

Ranger 1 Quote 13) “I mean I think enjoyment always has to come to do with it because you want it to become a memorable experience. I mean I remember when I had outdoor learning opportunities, it’s probably what shaped me.”

Ranger 4 Quote 14) “Yeah but also I think if you think back to my school days you think how much time did I waste just sitting there not even listening, staring out a window and probably about half of my school life was just wasted because I was not inspired at all and I’m sure that is the same with the majority of kids.”

Ranger 5 Quote 15) “Yeah I mean it’s funny generally I think they more, it’s not necessarily the activity, its more just being in the place they are in. I think they do get an awful lot from coming out here and maybe for them the activities are secondary.”

Ranger 5 Quote 16) “You know it’s something as a teenager you go away and you do your own thing but it’s when you get older and you start to think about the rest of the world rather than just you, I think then it [outdoor learning] makes a difference. I mean it might not make an immediate difference in the next couple of years but once you get to think about it you might think: ‘Oh I enjoyed that. Maybe I’ll go again.’”

Ranger 5 Quote 17) “There’s some many kids from Glasgow who have never been outside their own council... the countryside to them is the local park with the swings. It’s, it’s quite scary!”

Ranger 5 Quote 18) “…I feel that the youth of today... and some young adults too have lost contact with their environment. Completely, not even a wee bit. We’ve got kids who don’t play outside. I think we have completely lost touch with our environment. We live in such a manmade world, we work in a manmade

world, we play in a manmade world, we travel in a manmade world; that means for me when the kids come out here I want them to reengage with their environment and that is my focus."

Teacher 1 Quote 19) - "...and then I think they changed round the activities and then got them walking and got them out in the fresh air which is good as well!"

Teacher 3 Quote 20) "It was something I would walk up without any problem but taking kids up I hadn't really thought, you know a couple of the kids are going to struggle with this, and they did. It was hot and it was a bit sticky and so on and there was a few of them out of puff by the time we reached the top and you know you have got to rethink a few of these things. I think you know actually we've got kids who are couch potatoes."

Ranger 1 Quote 21) "...they're going to do activities and they are going to go on the Sir Walter Scott paddle steamer and they're going to do activities with the rangers and the artists; go away somewhere for their holidays, come back in S1. They'll be the first classes to get the Curriculum for Excellence; so it's a transitional project, so they've mixed a wee bit with the other pupils from other schools and then they'll come back out in S1 and work with the artists and the rangers again and their inspiration for their outdoor learning visits will be used to create something based on the poem for a modern day society so well hold a celebration event about it.

Ranger 4 Quote 22) "I do a lot of taking groups and schools into the forest, it's one of my key things...Just you know showing them where their food comes from."

Ranger 3 Quote 23) "...the biggest thing that we have against us is weather and facilities. I mean the Go Ape Centre is not manageable by as anymore so we have to book. You don't really get too much going on at HQ because the conference rooms are always booked so unless we can use either a visitors centre or book the space outside we're pretty limited as to what we can do."

Teacher 3 Quote 24) Interviewer: “So I suppose that's really, the reason why you chose it [the park] then as the location for your field trip?”

Teacher 3 “It was the video resources that we had and the fact that that it's got a visitor centre so they can go in and look and they can pick up information on the area and also the visitor centre through the Internet was saying that it provided park rangers who could facilitate trips for us and input onto that.”

Ranger 1 Quote 25) “...if they’re from the Glasgow area they’re not likely to travel to Breadalbane or the Cowl to do their activity although we try to persuade them to take the pressure off, so they mostly go to Balmaha or Luss.”

Ranger 6 Quote 26) “Purely from a getting there point of view those are the most popular locations which are Balmaha and Luss. I’m sure that schools would rather go to other places but the logistics of getting there as I explained earlier, its just not going to happen.”

Ranger 1 Quote 27) “We can’t cope with 120 young people coming out to visit us at the park in one day. Imagine the number of rangers that would require, that would be like all our ranger staff, so we’ve broken those up into visits into shorter and smaller groups, so I’ll go out and give a pre-presentation about what they will be visiting the park to do, what the parks aims are you know the face of the park and then they would take a group out and visit with the ranger and you know that would work really well”.

Ranger 6 Quote 28) “A lot of what governs us and causes us to be so rigid in the way we do things is the sheer size of the groups. We talk to 33 - 34 kids, it’s a lot to do and more often than not what we are doing is half the group with one ranger while the other half of the group is away with another and then we swap in the afternoon. That sometimes is very controlling and makes you have to stick to you know a rigid programme”

Ranger 1 Quote 29) “If you’re coming from quite far afield you wanna make the most of your visit, but then you’ve got the travel time linked into that so if you’re getting a bus and you’re from Glasgow then it’s

going to take you about an hour to get you out here. Maybe arriving around ten o'clock / half past ten; you've got to get off the bus do your toilet stop, then your ranger introduction, then activities might not start till half past ten or 11. Do an hour, have your lunch, do an hour, back on the bus travel back to school. So it might be a whole day for the young people but it might only be of pure activities only a couple of hours and they're broken up. So if it's something like a geography class then they'd maybe be taken to a couple of sites they'd maybe work with the rangers maybe the teachers could work with them on certain self led things."

Ranger 5 Quote 30) "I mean with Glasgow schools etc it's kind of easier probably for one ranger to go out and speak to 30 – 60 children rather than waste their time when they're out here being stuck in the building listening to people when they could be outside exploring the countryside and doing activities there. So from that, we can add on another hour of time there so it could be between four and five hours [of activities]."

Teacher 3 Quote 31) "They answered as groups, they each had individual workbooks and taking those in and checking through them and they are pretty well filled in and they perhaps back in the class they work in groups of three or four and they would use the booklets of others within the group to make sure that they had filled in the slots and the bits and pieces. That particular one at Loch Lomond they wrote an individual report on the areas, that one was managed and one was unmanaged and the problems that were being faced."

Teacher 2 Quote 32) "...the only issue was timing...because it kept being put off because of bad weather etc. We ended up doing it in a day and it was a 2.45 finish so we were very rushed for time and you almost felt that the rangers were rushing through it and not giving it as much depth as there could be. Some points I did think oh it's a bit of a waste being here and not mentioning this or that and so timing, but then that's something that can't be helped. You're restricted by the school times and getting the pupils back for then."

Ranger 2 Quote 33) "Yeah kids don't like rain. And if its practical its hard and I always you know, we try and prepare them, we always say bring wellies, bring rain coats you know and at the end of the day it's

Scotland but you find if it does rain that children just lose all interest and that's that and trying to fulfil the same kind of criteria inside as you would do in the experiments or doing practical work outside is hard work and it takes a bit more effort so um the biggest thing that we have against us is weather and facilities."

Teacher 2 Quote 34) "I think as I said maybe with a few pupils adjusting to how they should behave in an outdoor situation and that would obviously vary depending on the school but certainly there were a couple of pupils that maybe weren't as willing to listen to the rangers as they would do a teacher."

Ranger 4 Quote 35) "We've tried to try and get the schools to run it themselves but they have a lot on their hands and it's much easier for them to say, you know can you come out for a couple of hours and they can go and have their coffee and I'll take the kids out."

Teacher 1 Quote 36) "As I say the rangers came out and did a talk to them before hand and obviously we've been in class looking at national parks and then they were divided into groups and they went off doing different activities. Obviously we were limited to the time we had with the travel but then they did split them up into manageable groups of around 18 and then they looked at, as I said they did field sketching of the landscape, they did activities looking at sort of photo graphs and they also were spoken to about the sort of by-laws and the national park and the land use and conflict issues."

Ranger 1 Quote 37) "I guess it depends on the topic; for example with the 'Scott's Land' [a transitional p7/s1 project] one we are doing at the moment it's very structured because you've got a time table to stick to. You know you've got to get them on board a boat you've got to get them back on the bus so you have the time to fill. If it's you know maybe a primary school and they're say studying you know wildlife in Scotland or tourism in Scotland you'll find that primary schools are, they do topics that are on a project basis so they already cover cross curricular through that so you can use a topic to deliver lots of different things and that gives the rangers a bit of freedom to be creative with them."

Ranger 2 Quote 38) “It tends to be if we are doing an activity they would come to do that activity, we wouldn’t just go off on a tangent, they couldn’t just go off on a tangent. No we tend not to. We wouldn’t let them do that.”

Ranger 4 Quote 39) “There’s not that much structure to it [my activities] but certainly the schools will approach me quite regularly and ask me for either advice on doing something or to take them out”

Teacher 3 Quote 40) “Yeah I mean I tend to structure them quite a bit. I mean you can't leave things like that to chance really you've got to know what you want to do and what you'll be doing at various times”

Ranger 1 Quote 41) “We don’t have set programmes. We tend to have things we’ve traditionally done, because it’s what we’ve been asked for. I think things will move away slightly because of the advent of the Curriculum for Excellence and what it wants and what the teachers should be asking for. Cross curricular and inter disciplinary learning should come through that, so we’re very much in discussion when the booking forms are filled in. What are they currently studying, what will they be moving onto, what can we do to support those things so that when the young people come out we’re not staring at a lot of blank faces introducing concepts that they haven’t done; because that’s just a waste of every bodies time and it can be quite demoralising for the rangers as well. So you want to compliment what they’ve been doing or what they will be doing or focusing on and I think the main what we’re focusing on is moving away from what is traditionally seen as an end of year jolly and things becoming much more you know curriculum focused and what are the outcomes that need to be met and how can we help evidence that and achieve that.”

Ranger 1 Quote 42) “Yeah I mean the booking form has a wee space for topics covered in class recently and when they start to put down the sites that they are visiting and the topics that they working on you know things start to click and you sort of know what they’re looking for. And again if they’ve come out before then you know exactly and you know email systems these days its just you know send an email to the school, the teacher they can bounce stuff back discuss with the ranger, the booking forms completed

and then we have records of what the people have asked for in the past and then yeah it all kind of, all that information helps in the planning process."

Ranger 1 Quote 43) "[worksheets] provide evidence of learning"

Ranger 1 Quote 44) "swamp them with clip boards and pencils"

Ranger 3 Quote 45) "...you wish that they'd listen and not be just listening out for buzzwords because they'll just stop listening straight away and start scrawling and then you are like, 'wow'. You've lost your train of thought now so you're not always able to pick it up again."

Ranger 5 Quote 46) "...if you were looking at it purely from the point of view of here's the worksheet now go away and do it and or get back on your bus. That's not how I would envisage it working. It's an integral part of the process, so they are doing an activity and the worksheet is maybe just recording the thing - their outcomes really so they've got something to work on later."

Teacher 3. Quote 47) "They probably had the same input but I think the thing is getting out in the field gives you a chance to focus in on some of the kids who may not be as motivated as they see it for the first time and it gives you the chance to, particularly if you've got a ranger leading the group, you can go and work with some of the kids who might be struggling a bit more or you can make comments to the good kids to push them a little bit further."

Ranger 5. Quote 48) "I mean with Glasgow schools etc it's kind of easier probably for one ranger to go out and speak to 30 – 60 children rather than waste their time when they're out here being stuck in the building listening to people when they could be outside exploring the countryside and doing activities there."

Ranger 5 Quote 49). "…we've suggested it to a couple of schools, is to do it via a video link or a video conference. We've no idea whether it will work but we can try, we can but try. Another idea has been to

film it but that has to, you know that would be a bit mundane. You know watching a video of someone who's not really there is a bit boring but the actual video conferencing has yet to be tried."

Ranger 1 quote 50) "…but then it's a good thing as well, because outdoor learning is out the classroom it maybe reduces the barriers that the classroom context can have. Hopefully there's a bit of freedom and hopefully once they get into that mindset maybe they'll start to excel where as maybe they wouldn't have excelled before. It's [the novelty factor] not something I'm overly worried about and it might be a good thing."

Ranger 6. Quote 51) "I see it all the time. I see kids that are A1 stars in the classroom and they walk in here and they are like a fish out of water and there's wee Johnny who's never passed an exam in his life and suddenly is the star pupil of that day because he does go outside, he does climb trees, he does know that that's a blackbird. Suddenly he's buzzing and the teacher will say to me at the end of the day "My god just exactly what happened there. That child has sat in my class and not uttered a word and yet I bring him out here today and it's like a different person". So what works well for some like in the classroom…doesn't work well for others. And if wee Johnny can come out here and maybe have one good day and change his teachers view point on him then what's wrong with that?"

Ranger 1. Quote 52) "If its p1's they're coming to out to learn about, I don't know Autumn changes or something, you still want them to have fun but you want them to have connected with the natural environment"

Ranger 1, Quote 53) "How do we meet responsibility for all subjects like health and well being? Well by just being out in the park is your emotional wellbeing. Your physical well being - taking part in activities outside of the classroom will increase that. So that's meeting those outcomes. Maybe we need to incorporate more...Well the discussion and the debate that can form around the discussions that are being covered [in the park] can lead to literacy [skills], it doesn't have to be physically reading a book in the

countryside to meet literacy outcomes, and I think that that's what people start to think of but the more you look into it, it can be a bit more abstract."

Ranger 1 Quote 54) "Yeah I think overall, overarching everything, we try and promote a care and respect for the park and the natural environment of Scotland as a whole but focussing on the park because we are in the park. We want to engender that sense of sustainability that they can take back when they come back for a visit with their family …. so everything is done with an overview of the national park ... so that they just develop that sense of respect so that when they're visiting when they are adolescents, when they are older, that they'll have that sense of you know, behaving responsibly, of caring for the environment, that kind of thing. So everything really that we do is that education for sustainability issue/ ethos and there's threads of that throughout.

Teacher 2 Quote 55), "I think it [the field trip] was primarily to recap their knowledge, to sort of embed that knowledge more in the pupils. But certainly for all field trips there's a number of skills the pupils are going to develop, team work or you know communication or just you know being in the outdoors and all the benefits of outdoor learning and being kind of hands on and kind of seeing the places physically as opposed to just in a picture. So it [the field trip] was a combination of the gaining a greater knowledge but also developing skills from the different activities they had to do in the day."

Teacher 3. Quote 56) "...so primarily it was the education but the fact that they are out of the classroom working with other people that they might not normally work with and they are problem-solving, they are having to think, they are working in groups, social aspects of it and the fact that they are out in public and that they are being watched also helps as well."

Teacher 3 Quote 57) "You've got your NAB's to cover ... you know the fact that the kids are doing five Highers, the fact that they are being pulled here and there and everywhere; they've also got sort of school duties and sporting duties and extracurricular things that they are doing. You know just to propose that I am going to take them out for a day for a field trip oh oh oh."

Ranger 4, quote 58) “We have to do visitor management because that’s where, that’s what the press want. That’s where you get a picture of Loch Lomond as a bomb site and it’s on the front page of the Herald and they’re going “Loch Lomond national park it’s a S***t hole” and stuff like that. So out chief executives are all marketing media people. They want us to look dressed in pretty clothes and - I think there’s £2000 each on uniforms – what I am trying to say is that we don’t get any funding from the government to do education. We have got a list of… how many priorities, I think 15 priorities; visitor management is at the top and education I think comes 12th- something like that. So in order to earn our wages we have to do visitor management. Biodiversity comes in about 5th or 6th. So it all comes in above education. As individuals we fight for our education but if the crunch came to the crunch we would stop doing it because basically we wouldn’t have jobs.”

Ranger 4, Quote 59). “I can’t on a Saturday on Glasgow fair, I can’t not do visitor management. You know if a group wanted to come on a bank holiday Monday and do some education it’s just no way. If my boss found out, if the chief executive found out I probably get fired, it would be pretty serious.”

Teacher 3 Quote 60) “I mean you want to give them a little bit of time to go out and look at it themselves...I turned my back for two minutes and again they’re in there buying the pies and so on and all the rest of it. Which isn't a bad thing but you know you have just got to keep an eye on them. Anything out in the field like that you are giving them a bit of freedom but it is controlled freedom.”

Ranger 1, Quote 61) “I’ve seen the shocked faces when they get off a bus and they haven’t dressed for the occasion and they’re wearing a really nice white pair of trainers and you know they’re like “there’s midges and ticks! You didn’t tell me about that!” you know and we do try and there’s information on the website for the teachers about what they should be bringing and you do try and make them a bit aware about it but you know you think, national park! That should ring a few bells...”

Teacher 2 Quote 62). "I think they already had quite a good idea of the intermediate course and where it could tie in with what we were studying, and certainly during the actual trip they were linking it in with what they should know about. So they certainly seemed to have quite a good idea of the standards that they should be educating the pupils to."

Teacher 3 Quote 63) "Yeah it was just ideal. Everything was geared up for what we wanted with the kids. It was tailored to what we wanted, we had good local examples that I wouldn't necessarily off have picked out, and yeah I couldn't really fault it. I'd definitely put it in next year and yeah ask for the same again...I wouldn't change it again, it was ideal."

Ranger 4 Quote 64) "That's why I'm in this job I guess. I mean it's not really a career for me it's more of a vocation getting to preach to the masses."

Ranger 6 Quote 65) "Yeah we've got the best job in the world and we know that, and I don't think there is one person here who doesn't think that and if they do then they don't tend to last long, they tend to leave cause I don't think they can stick the fact that we are all so enthusiastic about it."

Ranger 3 Quote 66) "I think instilling a sense of interest, lighting a spark. I think that's something we do quite well because people see what we do and then they, you know it's quite funny, you always get at least one kid per group who goes, 'oh I wanna be a ranger'. And you know it's quite nice to kind of think aw wow I've instilled just that little bit of interest in you, and hopefully it will grow. And you know I always tell our visitor groups, senior or secondary I mean, that we do do voluntary duties and you get lots of them kind of signing up to that as well. So they are taking it on and taking it further so I think that is something that we are quite good at as well, is actually kind of getting a spark and following it up."

Ranger 1 Quote 67. "I think from the national park point of view it's the fact that we're seen as the pinnacle of if you like landscapes/ heritage, you know cultural biodiversity. You can see all these things in minute

detail in local parks, in country parks ....your school grounds and so on, but a visit to the park seen as the pinnacle of that... and that's where our strength is."

8 Appendix 1

8.1 Interviews for Park Educational Staff

Time Allocated – around half an hour.

Introduction.

Could you please describe your title and role in the park's educational structure…

What are the current educational activities happening in the park?

How long are the average visits?

Do school trips follow their own educational program for their visits or does the park set the program?

Are there certain more popular areas that the teachers focus on?

Do the teachers discuss with you what they shall be focusing on before the visit and if so what arrangements do you make to accommodate this?

Are the educational materials and activities provided by the park tied into a formal curriculum, either the older syllabus or the new Curriculum for Excellence?

Are worksheets provided by the park?

How structured are the educational activities provided by the park?

How much freedom are the visitors given to choose education activities?

What in general are the key educational points you wish to convey to a visiting school group?

Are your goals for a visit mainly based on educational or social outcomes?

Are you aware of the 'novelty effect'?

Does the park take any steps to deal with this, for example pre-visit/ post-visit activities?

Do you remain in contact with or meet up with the school parties after their excursion?

Do you get any feed back on the field trips from the school parties?

Are there any issues relating to informal education at the park that you wish to discuss?

Are there any problems with informal education at the park that you wish to discuss?

Are there any strength's with informal education at the park that you wish to discuss?

8.2 Interview For Visiting Teachers

Time Allocated – around half an hour

Introduction.

How large is your school party?

Which educational authority are you from?

What age group(s) does your school party consist of?

What is your specialist area of teaching, e.g. Science/Primary teaching/ Geography....?

How did you hear about Loch Lomond and Trossachs national park?

Why did you choose Loch Lomond as the location of your field trip?

What, if any, pre-visit educational activities did you perform with your class?

Did you perform more pre-visit activities with a particular section of the class? e.g. those possessing below average academic ability?

Did you discuss educational aims with the park staff before the visit?

What are your primary goals for the excursion?

What in general are the key educational points you wish to convey to a visiting school group?

What is the structure of your field trip? Does it allow for free choice learning?

Have you provided your class with worksheets for the trip?

How does your field trip experience relate to your current curricular work in the classroom?

Is the visit part of a class based investigation or project?

Are you planning any post-visit educational activities with the children after the visit?

Did you feel you school trip to the park was valuable? If so, why?

Have you visited the park before with a school trip?

Have you heard of the educational novelty effect? What if any steps have you taken to combat this?

Did you change your teaching style or methods during the field trip, if so how?

Are there any problems with informal education at the park that you wish to discuss?

Did you find any strength's regarding informal education at the park that you wish to discuss?

Are there any issues relating to informal education at the park that you wish to discuss?

9 Addendum

After the submission of the thesis a small selection of extra literature has come to the attention of the author. In view of the findings of this literature there are certain amendments and further clarifications to the thesis that have necessitated the inclusion of this final section. The additional literature influences claims made in the thesis about other research in the field of informal education as well as the extent of research performed in Scotland on bridging formal and informal education. The addendum also includes further information about the voices of Scottish young people and the debate surrounding adventure education.

9.1 Additional Scottish Research

Nicol and colleagues (2007) describe outdoor learning in Scotland as a mixed economy with provision coming from the public, private and charitable sectors. Due to practicality issues the project focussed on only one provider of outdoor education. However, it should be clarified that although the national park is a large facilitator of outdoor education it is not the only provider in Scotland. There are a variety of other organisations that perform outdoor education with school parties and youth groups. Of these organisations it should be noted that Learning Teaching Scotland and Scottish Natural Heritage (SNH) have formulated their own research and development programme, 'Outdoor Connections'. This programme investigated the current state of outdoor education in Scotland for 3 – 18 year olds. The existence of the Outdoor Connections programme augments the findings of this thesis and the author acknowledges that it makes a contribution to Scottish research in the area of bridging formal and informal education

Important findings for the thesis from SNH regarding outdoor education and the Curriculum for Excellence are that there is no national framework, statutory requirements, regulatory mechanism, formal teaching

qualifications, quality assurance or educational policy which encourages the delivery or maintains the standard of outdoor learning experiences (Nicol et al 2007).

At the same time results from SNH and Learning and Teaching Scotland's Outdoor Connections programme were found to agree with the results of the thesis. Both the thesis and SNH found that there are significant opportunities for outdoor education within the new Curriculum for Excellence, particularly for primary children. Additionally in secondary education geography and biology continue to provide the largest opportunities for outdoor education. SNH's research also concurs with the research findings from this thesis, that although some educators make remarkable efforts to get their pupils outdoors, the overall picture is inconsistent. Additionally, negative issues relating to teaching outdoors such as the financial cost, the organisational time required, transport issues and the weather were all findings found both in the SNH research and the work of this thesis. Finally the findings of the Outdoor Connections programme reflect the conclusions of this thesis, in that there needs to be greater communication, co-ordination of policy and practical support between formal and informal educational providers.

The original thesis claimed that there had been no Scottish research on the bridging of formal and informal education in regards to the new Curriculum for Excellence. It should be stated however that there has been research in this area; specifically the Outdoor Connections programme and the SNH report 'Taking learning outdoors' (2006). However, despite the valuable work of SNH, the field of research on informal education in Scotland remains very small. Additionally SNH's work was not mentioned by any of the park educators or teachers interviewed for the thesis. This is not to say that the work has not affected official park policy or that the educators interviewed are unaware of the work, but simply that they did not discuss it as an influence. This resulted in the omission of the research from the original thesis.

9.2 Young People

During the investigation at the national park themes arose about the disconnection between young people and the natural environment as well as the factors that influence young people's enjoyment of outdoor activities and their desire and ability to learn outdoors. However, some valuable research which investigated these issues in a Scottish context was omitted from the original thesis. The work performed by SNH on investigating young people's attitudes regarding outdoor education is highly useful in describing the social context within which educators at the national park operate.

Scottish Natural Heritage's report 'Scotland's teenagers and their awareness of, attitudes to, and actions for the natural heritage' (1999) found that young people do not believe that natural heritage is important in their lives and that there were low concerns about environmental matters. This is supported by the work of Nicol (2002) who argues that there has been a wider historical shift from the 1970s towards educational outcomes relating to personal and social education rather than environmental education. Higgins (2000) further argues that support for formal outdoor education provision as a whole has declined over the same time period.

A more recent report by SNH, 'Young people's interactions with natural heritage through outdoor learning' (Mannion, Sankey, Doyle, Mattu, & Wilson 2007) found that there were relatively few outdoor learning events taking place in local areas and that although young people stated they wanted more outdoor provision from schools, some young people did not see schools as well-placed to facilitate the sorts of outdoor experiences they valued mainly because of concerns with 'health and safety'. Work by Takato (2004) also found that for many young people in Scotland their relationships with the natural environment appeared "shallow and idealized".

It is important to include the findings from these papers in order to further clarify the social context within which the outdoor educators and young people at the national park are operating. This is a context in which, prior to the introduction of the new curriculum, Scotland's formal outdoor education section has been in decline and its young people disengaged from their natural heritage.

Further investigation of the views of young people would be very beneficial in understanding the bridging of formal and informal learning. While this was originally envisaged for the thesis, due to unforeseen events it was not possible. The concerns of Scottish young people were raised through interviewing the educators who work with the students. However, it would be advantageous for further researchers in the area to speak directly to the young people involved at the national park about their concerns and experiences.

9.3 Adventure Education

The final area from the new literature which is of interest to this project is the debate surrounding adventure education. Due to the lack of overnight accommodation and limited staff numbers many of the more extreme adventure activities, which are described in the North American and Australian educational literature as making outdoor education effective, are not currently facilitated through the national park ranger service. This was the reason for this literature's exclusion from the original thesis. However Martin (2004) states that "high adventure activities" - for example white water rafting – are one of the most effective educational tools available for developing positive relationships between people and the environment. While the educational ranger service at the national park do not themselves provide high adventure activities to school parties it is important to contemplate Martin's ideas as well as consider the extent to which adventure activities enhance the outdoor learning experience and how they can be best utilised to achieve social and educational goals.

Overall this section has been included to rectify the claims of there being no Scottish research on the bridging of formal and informal education and to acknowledge the work performed in this area by Scottish Natural Heritage. The addendum has also included additional information on the views of young people regarding outdoor education; the context within which Scottish outdoor education operates and finally it has highlighted the role of adventure education within outdoor learning.

9.4 Additional References

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