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The confluence of methods: A case study investigating the benefits of fieldwork to year 12 students studying rivers

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Abstract

Fieldwork is seen as an integral part of Geography by many and has been cemented into forthcoming teaching by the recent new syllabi. Geography teachers are always looking for opportunities to go on fieldtrips and to 'do' fieldwork, but how often do we consider why we are doing it? Is it actually beneficial to the students or do we do it undertake these expeditions because we feel it is expected of us? In addition, pressures to minimise timetable disruption and tighter Health and Safety regulations mean that the scope and frequency of fieldwork is often curtailed. Any fieldwork undertaken must therefore be highly focused on learning to ensure that students can obtain the maximum benefit from the experience. This study looked at one example of a Year 12 residential fieldtrip to assess students' learning about rivers. Photo-elicitation, mind mapping and interviews were used with a sample to assess knowledge before and after the trip. In addition, whole group questionnaires were used to find the students' perceptions of fieldwork. Whilst there was no conclusive evidence that this particular trip helped the sample students to learn about rivers, the study found many positive benefits including improved staff-student relationships, and more enthusiastic students.

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Introduction

"Fieldwork provides many geography teachers and students with some of their most significant and enjoyable educational experiences" (Canton, 2006: 7). Fieldwork is seen as synonymous with Geography and is connected with the subject more strongly that it is with others like history or science. Whilst experiences of fieldwork can be found in other areas, Geography has a "historically accumulated experience" and is able to "take the lead in planning these [wider] dimensions of education in the whole curriculum" (Foskett, 1997: 190). Fieldwork is often used as a way of attracting students to participate in the subject by highlighting the destinations in prospectuses and websites of schools and universities. It is also used in schools to attract students to choose Geography at GCSE and A-Level (Ferretti, 2007). Such is its importance that the Qualifications and Curriculum Authority "guidelines clearly state that fieldwork should be included in both AS and A2" (Pointon and Wood, 2007).

Fieldwork takes students outside their normal comfort zone and puts them in new and challenging situations. Not only is this necessary for them to collect the information needed from a geographical point of view, but it also allows them to develop as individuals as well as geographers. In November 2006, the Government introduced its *Learning Outside the Classroom* manifesto (DfES, 2006) with the aim of encouraging all young people to experience learning in a broader context that is not confined to the classroom. This is something that Geography teachers have been doing for years and this recent broader initiative serves to highlight the continued relevance of fieldwork today.

In this assignment I am going to investigate the effectiveness of fieldwork as a teaching and learning method, looking specifically rivers in the context of a group of Year 12 students who

participated in a four-day residential fieldtrip to Derbyshire. This case study will serve to demonstrate the opinions and perceptions these young people have of geography and of fieldtrips and, through comparative questionnaires, will contrast their pre- and post-trip opinions. Further in-depth study will be used to explore the extent of the geographical learning facilitated by the trip with a six of the students. These results will be used to drive a discussion of the relevance of fieldwork and the importance of it in Geography as well as in a wider learning environment.

First I will examine what students should be learning about rivers and discuss why it is a topic that is seen as important enough to be taught in schools. To do this, I will consider the specification of the OCR (Oxford Cambridge and RSA Examinations) exam board, used by the school in which my case study is based, as well as evidence from interviews with the Head of Department and Fieldtrip Organiser. I will put forward the case for fieldwork as an aid to the learning of geographical topics. Secondly I will explore the students' expectations of the fieldtrip to explore what they hoped to gain from the trip and what they see as the point of fieldwork in general. This will lead into a discussion of the results gained from questionnaires and in-depth interviews with students to see how they felt they had benefited from the trip.

Throughout, these larger sections will be tackled using a series of research questions that were posed to focus the project. The first question is 'what should students be learning about rivers and why?', which is followed by thinking about how fieldwork can support this learning. This section is broken down into 'why are rivers important?' and 'why is fieldwork important?' which leads into 'why have I chosen to focus on rivers fieldwork?' A further discussion of other literature on fieldwork helps to place this work and this fieldtrip in the context of other experiences of fieldwork both nationally and globally to give a broader overview of what students elsewhere are learning and why. The second question asks 'what were the students' expectations of the fieldwork and how did they change?' which leads into the third research question, 'what did the students learn about rivers?' These steps will be used to show how this fieldtrip supported these Year 12 students in their learning about rivers and will go to suggest how fieldwork can support student learning in other ways.

Placing the research

Why are rivers important?

River Environments constitutes part of the compulsory Managing Physical Environments unit of the OCR GCE AS Level, which also includes Coastal Environments, Cold Environments and Hot-arid / Semi-arid Environments. This is one half of the AS Level and counts as a quarter of the A Level (OCR, 2008).

Students learn about the processes and factors which produce fluvial landforms and are asked to engage with questions about how a river can be a multi-use resource, what issues arise as a result of river basin development and the management challenges associated with the developments. These questions help the student to focus their learning on the key concepts that cover the processes of river evolution both spatially and temporally, river landscapes and features, and drainage basins. These all help to build a bigger picture to allow students to understand interactions between humans and rivers and how and why these can and need to be managed appropriately.

Rivers have been a stable part of the geography syllabus because of their importance to human existence. Rivers have shaped the natural environment to form waterfalls and v-shaped valleys, deltas and ox-bow lakes, to name but a few of the features a student will study in their time in school. They have also been instrumental in locating settlements; places were situated near a river for trading purposes, as a crossing point or a defensive measure. The rivers would also have provided power for industries and a source of drinking water and food. Students learn about the historical implications of a river in terms of its human and physical impacts before going on to discover how and why rivers are used to facilitate human kind. Within this, students will cover case studies where river management has failed to prevent, or has even exacerbated, problems which cause flooding and how this can have a wider impact on the lives of the local residents than the immediate problem of rising water. The Royal Geographic Society (RGS) highlights Professor Angela Gurnell's work on restoring urban rivers (2009) on its website under the heading 'Geography Today' as a topic which is currently at the forefront of geographical investigation. Without the input at school level, future generations will not have an understanding of the importance of our rivers.

Why is fieldwork important?

Throughout the specification, fieldwork opportunities are highlighted. "There is an expectation that an investigation or fieldwork will be carried out to research the form and cause of river features or marine features" (OCR, 2008: 10). There is a number of reasons why fieldwork is a requirement of the exam board. Firstly, it allows the students to "develop fieldwork skills in the context of Human and Physical Geography which relate directly to their course of study" (p. 9). Secondly, it enables students to synthesis skills and knowledge learnt from a number of sources to give them the opportunity to "become adept in the use and application of skills and new technologies through their geographical studies both in and outside the classroom" (p. 7). Finally, the OCR exam board states that "this AS specification enables candidates to carry out research and out-of-classroom work, including fieldwork, as appropriate to the topics selected" (p. 5), which would appear to suggest that fieldwork is also part of the requirements simply because it is seen as being an integral part of Geography.

There is a clear framework provided by the exam boards of the areas where students should be participating in fieldwork and what they should be studying. But there are also other reasons why Geography teachers are so keen on fieldwork and why many are willing to spend time away from their families during the trip and countless hours before and after preparing and debriefing the activities. It is also important to acknowledge the weight of responsibility placed on teachers who lead fieldwork trips, especially those that involve a residential element. There is a requirement at Vista Community College (name changed for anonymity) for a ratio of 1 teacher to every 10 students. This responsibility of *locus parentis* is often given to people who are only a few years older than the students they are taking, especially when newly qualified teachers go on sixth form field trips.

Victoria Cook, a Geography teacher and PhD researcher from Leeds, investigated the views of teachers towards fieldwork with particular reference to the way in which they perceived the risk element of it. She interviewed ten teachers from six schools in the north of England. The schools had small departments, some with only one teacher; the catchment areas were ethnically diverse and had lower than average results.

One of the main reasons for the perceived difficulties in organising fieldwork was the amount of paperwork involved. The Local Education Authority requires trip leaders to be familiar with the information provided in a 350 page document; something that takes time and concentration which many teachers do not have free in their timetable. The area had also sadly suffered the fatality of a student on a fieldtrip and as a result parents and teachers viewed it as a risky activity. Cook (2006) points out that children are more likely to be involved in road traffic accidents than they are to be killed on fieldtrips but this does not stop parents allowing children to walk to school.

Coupled with parental perception of the risk of fieldtrips is the fear that teachers will be liable if something goes wrong whilst they are in charge of the children. Legally it is the teacher who could be prosecuted and many will not be willing to put themselves in such a position, particularly if they are taking children who may not have the best behavioural record. There seems to be a link between the value teachers place on fieldwork and the extent to which they are willing to take responsibility for a trip. Those who see fieldwork as a valuable tool which will be of benefit to the students, and, as will be seen in Lai's (1999) article, to the relationship between students and teachers, will be more likely to put the effort in to facilitate a trip; likewise those who do not see the benefit will not be inclined to work as hard for something they do not see as useful.

Cook highlights the responsibility that some teachers voluntarily take on, often without remuneration, because of the value and importance they place on fieldwork. Wood and Walker (2007) emphasise the increasing pressure on curriculum time, which is making fieldwork harder to fit in to the timetable. Despite these difficulties from a number of different sources, geography teachers are still willing to take on the challenge because they see it as an important part of geography and of a student's development, and that it is something that is worthwhile and indispensable in the modern geography curriculum.

Fieldwork is also an important tool for building on students' personal experiences and enhancing their understanding of learning outside the classroom. Cook (2008), whilst researching towards her PhD, undertook a study aimed at discovering the perceptions Year 9 students had towards fieldwork. This was done with pupils from three state secondary schools in an urban area in northern England. The premise for the study was that the different personal factors of the students would lead them to draw a diverse range of experiences from the trip. Accepting this fact will help teachers to plan for learning in different ways to maximise the benefit.

Three hundred and thirty eight students from three schools undertook a pre-fieldwork activity to gauge their perceptions of fieldwork. Due to the differing sizes of the schools, one had 259 pupils participating in the fieldwork, one 70 and the third only 9 girls (it was a single-sex school). Cook supplemented this data with "in-depth interviews that were carried out with 11 or 12 students in each school." (p. 72). She does not say how these students were chosen, nor does she take into account the third school that only had 9 participating students so could not have provided 11 or 12 students. This anomaly continues unchecked when she mentions that no students at the girls' school associated the fieldwork with Geography. It seems unbelievable that a state secondary school could have a Year 9 intake of just nine students. Perhaps the fieldwork studied in this school was combined with another subject to make the trip viable, thus removing Geography as the sole focus of the trip. In addition, Cook fails to give details on the content of the three fieldtrips at the different schools which makes comparing them directly problematic. Finally, when analysing data collected from the students, she seems to infer a greater significance from her statistics than the numbers would seem to allow. For example, she describes a school where teachers are encouraged to explicitly introduce the idea of learning styles into their classrooms and highlights a total of 30 students who noted this in their pre-fieldwork activity, saying that this "demonstrates the effect of framing on the students' perception of fieldwork" (p. 73). These 30 children represent less than 12% of the students at that school. If this was meant to be a whole-school initiative, one would expect a much higher proportion of students to be responding in this way and therefore 12% of the sample does not strongly support her statement.

Despite these methodological discrepancies in the data collection and, perhaps, some over-emphasising of statistical information, I agree with Cook's basic premise that fieldwork is an intensely personal experience which influences and can be influenced by a range of external factors. It is a teacher's job to try to ensure as best they can that each student benefits as much as possible from the experience. Discovering their perceptions and preconceptions beforehand will help them to tailor the fieldwork to their group to maximise its impact.

There is a lot of published research on fieldwork in one form or another but due to the wide variety of possible subject matter within the scope of fieldwork and scenarios in which it can take place, there is very little literature pertaining specifically to river-based fieldwork. The majority of small scale studies are, like this one, case studies because of their individual and discrete nature.

Kwok Chan Lai (1999) was a researcher at the Hong Kong Institute of Education when he studied a geography fieldtrip to Cheng Chau, one of Hong Kong's outlying islands. The aim of the research project was to investigate the different experiences of students and staff on a geography fieldtrip. The trip comprised 109 boys from Secondary 4, the equivalent of Year 11 in the UK, four teachers (three of whom were Geographers) and Lai as researcher. The trip studied both human and physical features of the island and used a variety of teaching methods.

Lai used a multi-method technique to triangulate his findings in an attempt to increase the validity of his results. He conducted interviews with three of the teachers and three groups of students, although he does not say how he selected the teachers or students he spoke to or how many students were in the groups. He also took part in the fieldtrip to allow him to use participant observation as one of his methods and he backed this up with documentary evidence from the students' worksheets.

Before the trip, the teachers were interviewed about their expectations of the trip. They had all participated in the Cheng Chau fieldtrip in previous years and felt that it was "one of the most distinguishing features of geography", that "student's responses to past field trips had been favourable" and "that their students, including those who were normally inattentive, behaved better in the field than in the classroom" (p. 243-244). Despite this, it seems from the responses of the teachers after the trip that they were almost surprised by how much they perceived the students had benefited because of the amount and detail of their comments. Lai highlights "a much richer outcome than what the teachers had intended" (p. 252) because of the issues the teachers brought up, which included better student-teacher relationships, students working on their own accord and students appearing to engage with the subject. However, I would argue that these outcomes are ones which cannot be planned for and are ones which teachers are not going to base the premise of a fieldtrip on. Of course, better relationships between teachers and students is a good result and will undoubtedly help both parties in future learning but it is something that happens spontaneously rather than being engineered. If these by-products, which are extremely useful, became the *raison d'être* of the trip, there would be a danger of losing the geographical focus, which would ultimately reduce the viability of the trip in the eyes of a school's Senior Management.

Some of the students on the trip mentioned in their interviews that they preferred the second half of

the trip where they were able to work on their own without teacher supervision. They disliked the teacher-led walk at the start because they felt that they were being stifled. Lai said that "[i]n the more free learning environment, students were found to be more proactive and teacher-student rapport improved. Some students have taken greater responsibility for their learning" (p. 252). He goes on to suggest that greater freedom may be beneficial to students and quotes Hawkins (1987) who left his group to go and sit on top of a hill and let the environment wash over him. Lai does this without thought of the implications on staffing and risk assessments that this greater freedom for students would require. Whilst I agree that students need to be able to conduct fieldwork without being mollycoddled by their teachers, it is important to consider the risk factor when carrying out these activities.

In conclusion, Lai states that "a significant number of learners are more inclined to have greater freedom and have more control of their learning in the field" (p. 253). This assertion is problematic because of the way in which he has conducted his sampling. He does not say how many students he has interviewed or how they were chosen, only that there were three groups. He later refers to "five of the ten students" who "preferred the afternoon mode" (p. 248) which had more freedom. Whilst half a body of students may be significant, 5 students from a year group of 109 represents only 4.6% of the total, a number which cannot be seen to be representative of the entire year group, especially as there is no mention of how they were chosen. Making generalisations from this case study with such small numbers of interviewees as evidence is perhaps extending the scope of the research further than I am comfortable with.

Why have I chosen to focus on rivers fieldwork?

Fieldwork can support a student's learning about rivers by providing the opportunity for first-hand interaction and experience with the subject matter. Following the course of a river from source to mouth provides a much clearer illustration of the changes involved than a textbook can. It gives students the chance to take measurements of the river using specialist equipment rather than relying on secondary data. Using a wider scope, fieldwork demands teamwork and cooperation as well as synthesising a range of skills and knowledge to collect, interpret and present data in a meaningful way. Chatterjea et al. (2008) identified this through highlighting a need to process the data in a more efficient manner to ensure that the maximum benefit can be derived from pupils' efforts.

I have chosen to look specifically at the fieldwork on rivers because it is a relatively unstudied area. The study of rivers is a major requirement of the syllabus (see Table 1) as is the opportunity fieldwork. For the majority of the population it is easier to get to a river than it is the coast and therefore it is it logical to assume that a river study is likely to be more accessible to more students. The river study also formed part of the fieldtrip I would be accompanying and due to constraints on time, fitted in with the research outline.

Doing the research

For research on this scale, there is a choice of methodology between case study and action research. Denscombe (2007) discusses in detail the strengths and weaknesses of each method which can be deployed with great effect in the correct situation. Action research relies on a process of continual planning, doing, evaluating and incorporating the results of the evaluation into driving the research forward. This is useful in cases where there is time between sessions where data can be analysed, and so interpreted to be used in the subsequent planning stages.

A case study is designed to investigate one particular incidence of a phenomenon in detail to allow the researcher to study the relationships and processes that create the outcome (Yin, 1994). This allows the study to be finite without the requirement for the research to be evaluated and reincorporated. A case study approach was chosen because it suited better the type of research that was going to be carried out. As the fieldwork took place over the course of four consecutive days there was no opportunity for the cyclical evaluation process, which is the strength of action research. Whilst feedback from this fieldtrip will inevitably be used in the planning of the next trip, that is on a much larger timescale than this research is concerned with, so action research was deemed not appropriate in this case.

Case study methodology has been criticised because the boundaries of where one case finishes and another starts are not always easy to define. In this instance, the case is easily defined as the group of students and teachers who went on the fieldtrip this year. Access is another issue that can create problems, but as a trainee teacher in the school involved in the study I was afforded access to students and teachers in a way that another researcher may have found problematic. Finally, case studies have been known to suffer from the ‘observer effect’ where the researcher influences the

outcome of the research simply by being present and influencing the way subjects behave. In this case I had been in the school for two months as a trainee teacher and become know to the students and teachers so my influence as an observer was minimised.

The subject for this case study was a four-day Geography fieldtrip at the beginning of March to Derbyshire for Year 12 students at The Vista Community College in Cambridgeshire. The school is an 11-18 mixed comprehensive school with about 300 pupils in the sixth form, approximately a quarter of who study Geography. The trip aims to cover a wide sweep of the curriculum with opportunities for conducting fieldwork in a number of areas including river studies, scree slopes, land use and glacial features. This year 37 students went on the trip from a class of 40.

The planning for the trip began months in advance, as it required approval by the senior management team and inclusion in the school calendar. Parents were notified by a letter from the trip organiser of the opportunity; given details, and the costs were explained. Whilst there is no obligation for pupils to go on the trip and it is possible for them to participate in the AS and A-Levels without going, the department strongly urged parents to consider allowing their children to go. Financial support was available for those students for whom it proved difficult to pay.

Due to the difficulties in taking time off timetable and the paperwork, cost and organisation involved in taking students out of school, the Head of Department tried to fit in as many opportunities for fieldwork as is possible in the four days. Table 1 below shows the fieldwork activities, along with their learning objectives and how they fit into the wider Year 12 scheme of work.

A variety of methods were used during the research process in order to gain as much insight into the case as possible during the short time frame. This kind of multi-method approach allows for triangulation of results, which increases the rigorousness of the study (Darbyshire, 2005). Questionnaires were given to the students both before and after the trip. These were aimed at answering the second research question; ‘what were the students’ expectations of the fieldwork and how did they change?’ All the geographers in Year 12 were given the pre-fieldtrip questionnaire to gauge their expectations of the trip and to find out why some of the students were not participating in the trip. Only students who had been on the trip were asked to complete the post-fieldwork questionnaire, which asked similar questions but also if their opinion of the subject had changed.

The questionnaires were conducted at the beginning of a Geography lesson in the weeks before and after the trip, as this was the most efficient way of seeing the students in groups. As some of the students were not present on the days the questionnaires were conducted for various reasons, there is a difference in the number of returns before and after the trip, but this is to be expected.

Year 12 Autumn term	***Managing Physical Environments***	**Fieldwork Activity**	**Learning Objectives**
	River Environments	• River Study	To give student the opportunity to engage in a variety of data collection techniques. To test theories learnt in the classroom such as erosion on outside and deposition on inside of meander.
	Coastal Environments		
	Cold Environments	• Scree Slope study	To give student the opportunity to engage in a variety of data collection techniques. To test theories learnt in the classroom. To take students to an unknown environment which most students have not been before.
	Hot arid and semi-arid environments		
Year 12 Spring / Summer term	***Managing change in Human Environments***		
	Managing urban change	• Meadowhall Shopping Centre • Bakewell	To visit one of the largest out of town shopping centres in the UK. To experience the re-presentation of place used to attract customers. To see how an old market town has adapted to become a tourist centre.
	Managing rural change	• Blue John Cave	To see an old industry first hand To discover how it has changed over time to survive.
	The Energy Issue	• Hydro Electric Power – Ladybower dam	To show students the potential of HEP in the UK. To demonstrate the sheer size of these projects.
	The Growth of tourism	• Castleton and Tideswell comparisons • Dovedale and Mam Tor – National Park management	To compare two villages of similar size in an area with distinct functions (or lack thereof) in the tourist industry. To experience places managed by the national park to assess the management processes used

Table 1: Fieldwork activities (OCR, 2008)

Denscombe (2007) argues that a sample should not have less than thirty respondents because this leads to distortion of the numbers when they are converted into percentages; which skews the

results in much the same way as I highlighted in Cook's (2008) article. Due to the small numbers involved in this case study, getting 30 paired responses from 37 participating students would have been very difficult and, due to the short timescale, chasing the missing responses was not possible. I think that the 25 paired responses provided a good sample and I have included the number of cases next to all percentages quoted in my analysis for clarity.

The aim of this study was to investigate the benefits of fieldwork in the process of learning about rivers. The questionnaires do not deal directly with rivers but with the trip and Geography in general, as I felt it necessary to be able to place the river study in the wider context of fieldwork. The questionnaire method was not suitable for discovering what the students knew before and had learnt as a result of the trip because that requires a more in-depth approach; therefore other techniques were deployed.

In-depth study, which involved informal interviews, photo-elicitation and concept mapping, was carried out with six students before and after the trip aimed at answering the third research question, 'what did the students learn about rivers?' The three boys and three girls were selected, by the Head of Department, because they demonstrated a range of abilities and were members of his class who I had taught on previous occasions and were willing to participate.

Photo-elicitation was used as a way of introducing the topic of river studies to the students. They were given a sheet of paper with a photo of a river meander and were asked to label the picture with any detail they could whether or not is was specifically river-related. Whilst they were labelling, I explained the purpose of the research to the students and asked them to elaborate or explain some of the notes they had made. Such a technique is beneficial, especially when working with young people, as it helps to build trust (Hurworth, 2003) and is a way of breaking eye contact.

The second sheet they were given consisted of the words "Meander" and "River" in the middle. Students were then asked to create a concept map adding anything they felt relevant to the two words and joining them together with lines if they felt necessary. A concept map is "a tool used to represent an individual's [...] knowledge and ideas about one particular theme" (Meier, 2007). It was made to clear to the students that there were no right or wrong answers; I was interested in what they knew rather than what they thought was correct. These interviews were conducted

informally so as not to create the impression of the research being a test, something which regularly occurs in schools (Hazel, 1995).

The two techniques were repeated with the same students after the fieldtrip. The original sheets were returned to the students who were asked to add anything they could; again it was stressed there were no right or wrong answers. As well as the photo-elicitation and the concept mapping, there was a discussion with the students about their experiences of the trip, what they liked and disliked as well as how they felt the fieldtrip would help them in their exams.

The final method of data collection used on the fieldtrip was a combination of participant/non-participant observation including notes made during and after the trip. The process of researching and teaching or teaching and researching throws up some difficulties as it becomes problematic to define where the divide between the two is. Do the students view me differently knowing that I am conducting 'research', using them to as my data set, than they would view me as a 'normal' teacher? Does it raise ethical questions that I was making observations of students that they may not necessarily have been aware of?

Hester Parr argued that if she had informed people that she was conducting covert ethnography on them, and asked for their consent, it would have removed the covert element and may have caused them to alter the very behaviour she was trying to study thereby rendering the subject "unresearchable" (2001). As long as the research did not cause physical, emotional or psychological harm to anyone and is the most effective way to conduct the research, she argues that it is as ethically justifiable as it can be.

In this case, I told the students who were chosen for the in-depth study what I was researching and why, and explained the research process to them. I made it clear that it had no consequences for them in terms of their school attainment and that I just wanted them to be honest and to try their best. The remaining students who only completed the questionnaire knew I was conducting some research on the fieldtrip but they did not know the details. I do not believe that my participant/non-participant observation caused any harm to any one and, therefore, believe that it was ethically justifiable.

Discussions with the Head of Geography and the trip leader also took place to find out about the

process of organising the trip in the wider school context. This is important due to the increased pressure on schools to fit in more teaching to already tight timetables. Most recently, this has been the Government-directed increase in the amount of physical exercise that must be delivered each week. Inevitably this has an impact on the other subjects and results in cuts being made.

As with any case study, the research carried out is based on the results gathered with a specific group in a particular place at one time. Therefore the results cannot be used to make generalisations about the benefits of fieldwork to students across the country but can be used to illustrate one discrete example.

Analysing the research

What were the students' expectations of the fieldwork and how did they change?

In order to ascertain if the trip was a useful part of the students learning, it is important to find out what they were expecting to get from it. All too often the expectations of students are not considered and the success of a field trip is judged by the criteria set down by the teachers in charge. Before taking part in the fieldtrip, and on their return, students were asked to complete a short questionnaire about their feelings and expectations towards the trip. The data was collated and only responses from students who had completed both the pre- and post-fieldwork questionnaires were included in the analysis. Twenty five paired questionnaires from 9 boys and 16 girls were used in the analysis. The first section of the questionnaire asked students to rate statements on a scale from 'Strongly agree' through 'Neither agree nor disagree' to 'Strongly disagree'. These were aimed at discovering the student's opinions of the importance and relevance of fieldwork.

The first statement was "Fieldwork is an important part of learning Geography". The results before the fieldtrip showed that all the students agreed or strongly agreed with the statement highlighting the belief that the fieldwork is an integral part of their Geography education. The post-fieldtrip results show that two students from the sample neither agree nor disagree with the statement, perhaps as a result of feeling the trip was not as important in their learning as they had previously thought. However, there is a large increase in those students who strongly agree with the statement, from 16% (4 students) to 52% (13 students). This implies that more than half of the sample felt that the fieldtrip was an important and valuable part of their Geographical learning.

Students were asked to respond to the statement "Fieldwork makes learning fun". Before the trip 32% (8 students) strongly agreed and 68% (17 students) agreed with the statement. After the fieldtrip, there was a 20% (5 students) increase in those who strongly felt that the learning on the fieldtrip was fun. Increased enjoyment during the learning is a positive sign that students were enjoying the subject and it is hoped that the enjoyable experience will prove valuable when recalling the information.

Part of the survey asked students what they were most and least looking forward to on the trip. Common responses about what people were not looking forward to included being outside in the cold, getting wet and muddy, and walking long distances:

Q – What are you least looking forward to on the trip?

"Bad weather, being tires and really long walks" (questionnaire 33)

"Being away from home" (questionnaire 28)

"Getting muddy and wet. Aching after walking. Being hungry" (questionnaire 23)

"Walking miles!" (questionnaire 3)

I think that these were fears of the unknown and whilst we did walk over 20km on the trip in some cold and wet weather, it was not as bad as had been expected. Misconceptions of fieldwork are not uncommon; Cook (2008) reported finding some striking misconceptions with one group of students where one thought a National Park would be like an urban play area with slides and that fieldwork was when workers came to maintain the area. Obviously, these preconceptions were addressed, and only present through a lack of prior experience. It is not uncommon for people to reflect on experiences and spotlight the high points so whilst they may have had to walk a long way, a highlight for one of the students was climbing Thorpe Cloud, a small peak at the south end of Dovedale where the gradient reaches 1:1 in places. After the trip, the responses to the question were much more specific; many students cited their least favourite part as having to eat lunch on the bus on the second day whilst waiting for the heavy rain to stop so they could carry out their surveys of Castleton.

Before the fieldtrip, 44% (11) of the students agreed with the statement that "Fieldwork helps me understand difficult things that I wouldn't understand in the classroom", a further 28% (7 students) strongly agreed and the remaining 28% (7 students) were unsure, selecting neither agree nor disagree. The post-fieldtrip results showed a big change in those who were previously unsure of the

benefits of fieldwork in helping to understand difficult concepts. Of those 7 students, 4 agreed with the statement after the trip and 2 remained unsure. The remaining student disagreed with the statement, implying that they felt they would have been able to learn about difficult topics more effectively in a classroom setting. This may have been due to the overarching nature of the trip, which was aimed at allowing students a taste of fieldwork in a variety of topic areas without focussing in complete detail on any one specific topic. This highlights a difference in expectations between student and organiser; the trip leader wanted to give a summary to give a real life experience to something learnt or going to be learnt in class where as the student was expecting to learn all about the topic.

Perhaps the most interesting result from the questionnaire was the result from the statement "There are things that we learn on fieldtrips that cannot be done in the classroom". Almost all of the students agreed or strongly agreed with the statement; only one was unsure. This shows that the students perceived the fieldtrip to be a very effective way of learning Geography. The results of the post-fieldtrip questionnaire show a shift down the scale with a drop of 8% (2 students) in those who strongly agreed and an increase of 8% (2 students) in those neither agreeing nor disagreeing. This implies that some of the students felt they could have learnt some things covered on the trip in the classroom.

The final statement students were asked their opinion on was "It is worth taking time off other subjects to focus on fieldwork". This is an issue that is at the forefront of the Senior Management Team's minds when they discuss and approve any excursion that eats into the teaching time of other subjects. Disruptions need to be minimised and contact time between teachers and students should be evenly distributed across the school; no one subject should dominate. 48% (12 students) of the students agreed, with a further 20% (5 students) strongly agreeing. 32% (8 students) had no strong opinion. When asked their opinion again after the trip, there was no change in the number of students with any opinion. There was, however, an increase in those who strongly agreed with the statement, which can be interpreted as students finding the trip more beneficial that they had anticipated. This demonstrates the usefulness of a residential fieldtrip that concentrates the focus of the students. I was surprised that so many students were ambivalent to taking time away from other subjects before the trip because I thought that they would be keen to get out of the normal school routine. However, this may in part be due to the timing of the trip in the school year; the end of the

Spring term is a busy time for students handing in projects and coursework, so having four days away from school and other subject work means there is more pressure on their return. One student wrote in their questionnaire that what they least were looking forward to was "coming back – missing out on coursework and having to catch up" (questionnaire 20).

These questionnaires, collected before and after the fieldtrip and representing over half the students, have shown how opinions of the fieldtrip have changed. They can be used to help support the view that teaching and learning through fieldwork can be a beneficial experience. There are, of course, those students who did not agree with the trends but with preferences for different learning styles, it is impossible to cater for all of the students all of the time. Fieldwork has been able to engage and help the majority of these students in a unique learning environment, one which they will be able to draw on for first hand examples later on in the course (and beyond).

What did the students learn about rivers?

Rivers are studied throughout the Geography syllabus, progressing and building on knowledge learnt in previous years. The three girls and three boys who took part in the in-depth section of the study had covered rivers in some way or another at least three times during their time at school. Most recently they had studied the topic as part of the River Environments module for the AS exam which they had sat in January.

The river section of the fieldtrip consisted of taking measurements of the river and then following it upstream. The meander selected was located in Hope, a small town east of Castleton in the Peak District National Park. The students were separated into three groups who were each given a part of the meander to measure. Width, depth, gradient and flow were recorded as well as bed load size at intervals on the cross section. Each group completed three sets of measurements to give a comprehensive record of the river at this meander.

The pre-fieldtrip concept maps were returned to the students who were asked to add anything else they could. Students Ab and H added that "you can take measurements" on a river but were not able to go into detail. Student J added a lot of specific information including noting that a river carries a "bigger load the bigger the volume" and that meanders turn into oxbow lakes "due to deposition". In comparison, the remaining three students were able to add little more to their concept maps, which could suggest that they did not learn much more about rivers having been to the river in

Derbyshire and taken measurements there. Interestingly, these three students are all boys, but I am not sure that their gender is the sole cause of this apparent lack of progression; that is an area of study that is not being discussed here.

The group was also asked to annotate a photo before and after the trip to allow a greater understanding of the information they knew previously and what they learnt on the trip. Most students were able to identify the key features like the oxbow lake, the meander and the banks of the river. Some were able to highlight areas where deposition and erosion were likely to occur and others identified the fastest flowing part of the river. On their return, the students were, on the whole, not able to add as much information to the photos as they could to their concept maps.

The aim of this investigation was to assess how fieldwork can help AS-level students to learn about rivers. From the evidence collected from the six students, there is little to suggest that the fieldtrip has had a significant positive benefit to them and their river knowledge. All of the students were able to add some information to their concept maps and photographs after the trip, but not as much as I was expecting. This may be, in part, down to the timing of the trip in relation to the first AS modules the students sat in January. They had completed the river and coastal environment sections and taken the exam, which would have involved a large amount of revision. It is therefore no surprise that some of their answers to the pre-fieldtrip questions were quite detailed. Perhaps the lack of perceived progression is due to the already advanced level of their knowledge of rivers due to the 'spiral curriculum' found in Geography (Bennetts, 2005). The fieldwork allowed the students to take measurement of the river and to follow it upstream but did not necessarily enhance their understanding of the processes involved unless they specifically found out about it from a peer or teacher.

There is evidence to suggest that the fieldwork may have created some misconceptions amongst the students, rather than dispelling them by providing a firsthand experience. Student J added to both the concept map and photo that the speed of the river and the gradient are used to work out the velocity in a formula "speed of river x gradient = velocity". The fact that she wrote it down twice implies that this is a misconception rather than a simple writing error. The surface velocity of the river is calculated by measuring the time an object takes to travel a certain distance by floating downstream. Whilst gradient affects the velocity of a river, it is not directly related: the steeper the

gradient, the higher the velocity.

There also seemed to be some confusion created between u-shaped valleys and v-shaped valleys. The Peak District has examples of both as it has previously been subjected to glaciations. The flow of ice carves out wide, u-shaped valleys that often have a small stream running down the middle known as a mis-fit stream. This indicates glacial rather than fluvial erosion, as the small stream would have been unable to erode such a large amount of material to create the valley. V-shaped valleys are formed by rivers that cut down into the bedrock. These are often narrower than those formed by ice. Students Ab, As and D all mentioned U- and V-shaped valleys in their concept maps without going into further detail. I cannot say from the evidence provided whether or not these three students know the difference between the types of valley or not, but I would highlight it as an area of possible confusion which may benefit from a little more attention by the teacher to dispel any misconceptions held.

It is very difficult to say for certain whether or not the fieldtrip has been successful in helping the students to learn about rivers. The high level of prior knowledge, coupled with the vast amounts of information given on the trip and the relatively short period of time spent on the river study makes it difficult to gauge progression. This may be in part due to the way this investigation has been planned; the in-depth methods have proved unsuccessful in providing a clear comparison of the knowledge of the students before and after the trip and by focusing on rivers, a subject which the students already knew a lot about, progression was difficult to identify. A more structured interview process using prompt questions may have helped to clarify some of the answers given and selecting a topic studied on the fieldtrip which they had not done in as much depth in school would have made the distinction between pre- and post-fieldwork clearer.

Whilst it may have been helpful for some of the students on the trip, the evidence gathered cannot support the proposal that this fieldtrip was beneficial to all the students in learning about rivers. That does not mean to say that the trip was a waste of time and completely unsuccessful; I would argue that it has been of benefit to students and staff alike in a number of different ways, many of which were not intended or planned for. The final question of the post-fieldwork questionnaire asked students how much they agreed or disagreed with the statement “I think of Geography more positively since the fieldtrip”. The overwhelming majority, 88% of the sample (22 students), agreed or strongly agreed with the statement showing that the trip had helped to improve their opinion of

the subject. Even if the trip has not helped all of the students in their knowledge of rivers, it has positively influenced them.

Conclusion

A number of methods were used in this study to find out the effectiveness of fieldwork as a tool to aid the teaching and learning of rivers to Year 12 students. These included questionnaires given to all members of the year group before the fieldtrip and to the participants after the trip, in-depth interviews involving photo-elicitation and concept mapping with six students as well as participant observation on the fieldtrip and discussions with the trip organiser and the Head of Department. This process was grounded in published literature that has helped locate fieldwork as a governmental priority, as a learning tool that is highly valued by the exam boards, and as a teaching tool that many geography teachers enjoy and encourage.

The results have shown that the majority of students who participated in this trip felt it benefitted them as geographers. They felt that it was a fun way of learning, that it helped them to understand concepts which they had found difficult in the classroom, and that it was worth taking time out of their busy school timetable and being away from other subjects to focus intensively on the trip. There were, of course, exceptions to the general trend, but these were few.

In terms of specific geographical learning about rivers, there was little evidence collected from the students to support the idea that the fieldtrip was beneficial to their learning. This may have been due to the less than ideal timing of the trip, being about six weeks after the students had sat the first of their AS modules which contained the Rivers and Coasts questions. The fact that the students already had a high level of knowledge of the subject made it difficult to establish that clear progression had been made. It may also have been due to the design of the fieldwork and the research process, as discussed earlier.

However, the evidence does suggest that the fieldwork was useful to the students in other ways. It improved their impression of the subject and when asked many of the students said they would go on another fieldtrip, if given the chance. Many commented that they had enjoyed being away from home with their friends and that it had been fun and an enjoyable way of learning.

There was also positive feedback from the members of staff who accompanied the trip. They felt that their relationship with the students they taught had improved by being in a different environment with them. It made their classes easier to teach because of the teacher-student relationship that formed and the shared experiences they had had. The trip organiser said she would ideally like to have the trip as early as possible in the Year 12 calendar to allow the benefits of the departmental bonding to be felt for longer. It would also give the students first-hand experience of rivers gained from fieldwork before they sit the exam, which may prove useful to them.

Fieldwork has been shown to be a useful teaching and learning tool, which can help build strong working relationships between teachers and students, that it can prove a memorable and valuable experience to students, and that it can provide wider benefits to students in more than just a geographical context. It may involve a difficult and time-consuming process to organise but, it seems, it is worth it.

References

Bennetts, T. (2005). The links between understanding, progression and assessment in the Secondary Geography Curriculum. *Geography* 90(2), 152–170.

Canton, D. (2006). *New approaches to fieldwork*. Sheffield: Geographical Association.

Chatterjea, K., Chang, C., Lim, E., Zhang, J., Theng, Y. and Go, D. (2008). Supporting Holistic Understanding of Geographical Problems: Fieldwork and G-Portal. *International Research in Geographical and Environmental Education* 17 (4), 330–343.

Cook, V. (2006). Inclusive fieldwork in a 'risk society'. *Teaching Geography* 31(3): 119–121.

Cook, V. (2008). Year 9 students' perceptions of geography fieldwork. *Teaching Geography* 33(2), 72–74.

Darbyshire, P. (2005). Multiple methods in qualitative research with children: more insight or just more? *Qualitative Research* 5(4), 417–436.

Denscombe, M. (2007). *The Good Research Guide for small scale social research projects* (3rd ed.). Maidenhead: OUP.

Department for Education and Skills (2006). *Learning Outside the Classroom Manifesto*. Nottingham: DfES.

Ferretti, J. (2007). What Influences Students to Choose Geography at A-Level? *Geography* 92(2), 137–147.

Foskett, N. (1997). In D. Tilbury and M. Williams (Eds.) *Teaching and Learning in Geography* (pp. 189–201). London: Routledge.

Hawkins, G. (1987). From awareness to participation: New directions in the outdoor experience. *Geography*. 72(3), 217–222.

Hazel, N. (1995). Elicitation techniques with young people. *Social research Update* 12.

Hurworth, R. (2003). Photo-Interviewing for research. *Social research Update* 40.

Kinchin, I.M. and Hay, D.B. (2000). How a qualitative approach to concept map analysis can be used to aid learning by illustrating patterns of conceptual development. *Educational Research*. 42(1), 43–57.

Lai, K. C. (1999). Freedom to Learn: A Study of the Experiences of Secondary School Teachers and Student in a Geography Field Trip. *International Research in Geographical and Environmental Education* 8(3), 239–255.

Meier, P.S. (2007). Mind-mapping; a tool for eliciting and representing knowledge held by diverse informants. *Social research Update* 52.

Oxford, Cambridge and RSA Examinations (OCR). (2008). GCE Geography Specification. Retrieved May 4, 2009, from http://www.ocr.org.uk/Data/publications/key_documents/AS_ALevel_GCE_Geography_Specification.pdf.

Oxford, Cambridge and RSA Examinations (OCR). (2008). AS Level Geography Support Materials. Retrieved May 27, 2009, from http://www.ocr.org.uk/Data/publications/ support_materials/AS_Level_Geography_SM_Booklet_Unit_F761.pdf

Parr, H. (2001). Feeling, Reading, and Making Bodies in Space. *Geographical Review*. 91(1/2), 158–167.

Pointon, V. and Wood, P. (2007). The new AS/A level specifications. *Teaching Geography* 32(3), 124–126.

Qualifications and Curriculum Authority (QCA). (2007). Geography Key Stage 3 Programme of study. Retrieved May 4, 2009, from http://curriculum.qca.org.uk/key-stages-3-and-4/subjects/geography/index.aspx.

Royal Geographical Society (RGS). (2009). Geography Today. Retrieved May 21, 2009, from http://www.rgs.org/GeographyToday/geographyarchive.htm#urbanrivers

Wood, Z. and Walker, J. (2007). Learning outside the classroom: what can be done in lesson time? *Teaching Geography* 32(3), 135–138.

Yin, R.K. (1994) *Case Study Research: design and methods* (2nd ed). Thousand Oaks: Sage.